BJMP

Volume 3 Number 2
June 2010

British Journal of Medical Practitioners

www.bjmp.org
ISSN: 1757-8515

British Journal of Medical Practitioners

Volume 3 Number 1 (June 2010)

http://www.bjmp.org

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British Journal of Medical Practitioners

Volume 3 Number 2 (June 2010)

Editorial

BJMP 2010;3(2):323

Obesity Hypoventilation Syndrome. Where do we stand 50 years later?

Roop Kaw

Initial reports of Obesity Hypoventilation Syndrome (OHS) date back as early as 1889[1], but it was not until 1955 that Auchincloss[2] and colleagues described a case of obesity and hypersomnolence paired with alveolar hypoventilation. Burwell[3] coined the term *Pickwickian syndrome* describing the constellation of morbid obesity, plethora, oedema and hypersomnolence. Hypercapnia, hypoxaemia and polycythemia were described on laboratory testing. Obstructive Sleep Apnea (OSA) had not been described at that time and came to be recognized for the first time in the mid 1970s. With attention shifting to upper airway obstruction, hypercapnia began to get lesser emphasis and confusion began to emerge in describing OSA and OHS. The term 'Pickwickian' began to be used for OSA-related hypersomnolence in the obese patient regardless of the presence of hypercapnia. This confusion was finally settled by the American Academy of Sleep Medicine (AASM) in its published guidelines in 1999.[4] The AASM statement identified that awake hypercapnia may be due to a predominant upper airway obstruction (OSA) or predominant hypoventilation (Sleep Hypoventilation Syndrome) easily distinguished by nocturnal polysomnography (PSG) and response to treatment. Both disorders are invariably associated with obesity and share a common clinical presentation profile.

Salient features of OHS consist of obesity as defined by a BMI > 30kg/m^2, sleep disordered breathing, and chronic daytime alveolar hypoventilation ($PaCO2 \geq 45$ mmHg and $PaO2 < 70$ mmHg).[4] Sleep disordered breathing, as characterized by polysomnography in OHS, reveals OSA (Apnea-hypopnea index [AHI]>5) in up to 90% of patients and sleep hypoventilation (AHI<5) in up to 10%.[5] Daytime hypercapnia and hypoxaemia are the hallmark signs of OHS and distinguish obesity hypoventilation from OSA. Severe obstructive or restrictive lung disease, chest wall deformities and hypoventilation from severe hypothyroidism, and neuromuscular disease need to be excluded before a diagnosis of OHS is established. As obesity is becoming more prevalent in western society, this disorder has gained more recognition in recent years. However, patients with this syndrome may still go undetected and untreated. No population-based prevalence studies of OHS exist till date but, at present, can be estimated from the relatively well known prevalence of OHS among patients with OSA. Recent meta-analysis with the largest cohort of patients (n=4250) reported a 19% prevalence of OHS among the OSA population, confirming an overall prevalence of about 3 per 1000.[6]

Whilst transient rectifiable nocturnal hypercapnia is common in patients with OSA, awake hypercapnia in OHS appears to be a final expression of multiple factors. There has been a debate about BMI and AHI not being the most important independent predictors of hypercapnia in obese patients with OSA. More definitive evidence for the role of OSA, however, is suggested by resolution of hypercapnia in the majority of patients with hypercapnic OSA or OHS with treatment, with either PAP or tracheostomy, without any significant changes in body weight or respiratory system mechanics. Yet some recent studies have shown that nocturnal hypoxaemia and diurnal hypercapnia, persist in about 50% of such individuals even after complete resolution of OSA with CPAP or tracheostomy. This raises questions such as how good is AHI as a measure of severity of OSA?

It is intuitive to argue that obesity may exert its effect through mass loading of CO_2 due to (increased production via) higher basal metabolic rate or reduced functional residual capacity on lung function. But why do only some severely obese patients with OSA go onto develop OHS? Is the pathophysiology driven by the severity of BMI? Whilst weight loss, particularly surgically-induced, clearly shows resolution of both OSA and hypercapnia[7], the role of BMI as an independent factor for hypercapnia has been challenged by the fact that only a small fraction of severely obese patients do in fact develop chronic diurnal hypercapnia. More importantly, not only can $PaCO_2$ be normalized in a majority of patients without weight loss and with positive airway pressure therapy (PAP), but awake hypercapnia can develop even at lower BMIs among the Asian population. Some investigators have tried to explain the incremental role of BMI as follows. In situations where AHI is not a presumed independent predictor of nocturnal hypercapnia, potential pathophysiologic contributors can include pre-event (apnea or hypopnea) amplitude in relation to the post-event amplitude.[8] Such inciting events for nocturnal hypercapnia may then be perpetuated in the daytime by factors such as AHI, functional vital capacity (FVC), FVC/FEV_1, or BMI as shown in the largest pooled data to date.[6] It has been shown that, for a given apnea/interapnea duration ratio, a greater degree of obesity is associated with higher values of $PaCO_2$.[9] However the same group of investigators, in another

study, did not find any of these factors to be related to the post-event ventilatory response.[8]

Looking further at the breath by breath cycle, the post-event ventilatory response in chronic hypercapnia may relate to eventual adaptation of chemoreceptors perhaps in consequence to elevated serum bicarbonate known to blunt the ventilatory drive.[10] Or it may relate to whole body CO_2 storage capacity which is known to exceed the capacity for storing O_2.[11] With definite evolution in our understanding of hypercapnia among obese patients, these questions continue to dominate. Some of the more pressing ones include: are the predictors of daytime hypercapnia different from those of nocturnal hypercapnia in obese patients with OSA? An understanding of these facts can help us with the more important understanding of the associated morbidity and mortality from OHS and its correct management. In addition, what is the true effect of untreated OHS on mortality independent of the co-morbidities related to obesity and OSA? Can morbidities like cor pulmonale and pulmonary hypertension be reversed with treatment of OHS? How do we treat patients with OHS who fail CPAP/ BiPAP short of tracheostomy?

Competing Interests
None Declared
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Research Article

BJMP 2010;3(2):326

Coronary Artery Disease in Africa: Community based study of Risk Factors

R.K.Pal and Ali Grera

Abstract

According to estimates of the World Health Organization (WHO), in 2005, out of 58 million total deaths in the world due to different causes 30 percent (17.4 million) were due to cardio vascular diseases, mainly heart disease and stroke. 53 percent of global deaths due to coronary heart disease occurred in males and 47 percent in women. The common modifiable risk factors identified were unhealthy diet, physical inactivity and tobacco use, leading to raised blood pressure and blood glucose, abnormal blood lipids and becoming overweight.[1] The WHO MONICA Project - an international collaboration of researchers from 21 countries, studied more than 30 populations, mainly from Europe, over a period of ten years, from the mid-1980s to the mid 1990s. More than seven million men and women aged between 35 and 64 years of age were monitored to examine if and how certain coronary risk factors and new treatments for heart disease contribute to the decline or increase of heart disease rates in these communities. [2]

Hence it has been observed that there have been number of studies on risk factors in patients of Coronary Artery Disease (CAD) but comparatively few studies are available on risk factors in healthy community members in Africa and still fewer on comparison of risk factors for CAD in the patients and community members from the same population. The present study was conducted on 528 community members in Tripoli the capital of Libya including 70 individuals having a history of suffering from Myocardial infarction (MI). The comparison of both the groups of same community revealed that hypertension followed by smoking, diabetes and increased body mass index were more prevalent in the community members with history of MI. It was alarming to note that these risk factors earlier thought to be more frequent after the age of 50 years are now present in higher numbers in the younger age groups of 35 to 54 and 15 to 34 years as well. As most of the risk factors stated above are modifiable there seems to be urgent need of initiating a National Health Programme on prevention and control of these risk factors. The priorities and strategy of such a National Programme has also been suggested in brief for consideration of the national decision makers.

KEYWORDS: Coronary Artery Disease, Coronary Heart Disease, Risk factors

Introduction

As highlighted in the World Health Report 2002, just a few Non Communicable Disease (NCD) risk factors, account for the majority of non communicable disease burden. These risk factors; tobacco use, alcohol consumption, raised blood pressure, raised lipid levels, increased BMI, low fruit/vegetable intake, physical inactivity, and diabetes, are the focus of the STEPs approach to NCD risk factor surveillance. [3]

A tool for surveillance of risk factors, WHO STEPS, has been developed to help low and middle income countries get started. It is based on collection ofstandardised data from representative populations of specified sample size to ensure comparability over time and across locations. Step one gathers information on risk factors that can be obtained from the general population by questionnaire. This includes information on socio-demographic features, tobacco use, alcohol consumption, physical inactivity, and fruit/vegetable intake. Step two includes objective data by simple physical measurements needed to examine risk factors that are physiologic attributes of the human body. These are height, weight, and waist circumference (for obesity) and blood pressure. Step three carries the objective measurements of physiologic attributes one step further with the inclusion of blood samples for measuring lipid and glucose levels.[4]

The risk factors studied by MONICA project of the World Health Organization (WHO), included cigarette smoking, blood pressure, blood cholesterol and body weight.[5]In many resource-poor settings, laboratory access can be difficultand expensive. A screening algorithm that includesgender, age, cardiovascular disease history, blood pressure,weight and height, and a urine dipstick test for glucose andprotein is likely to be more practical and may well providemuch of the predictive value of more complex blood-based assessments.[6]In addition, such algorithms should, wherever possible, useregional data on morbidity and mortality, because backgroundrates vary considerably between regions.[7] WHO/ISH (World Health Organization/International Society of hypertension) risk prediction charts provide approximate estimates of cardiovascular disease (CVD) risk in people who do not have established coronary heart disease, stroke or other atherosclerotic disease. They are useful as tools to help identify those at high cardio vascular risk, and to motivate patients, particularly to change behavior and, when appropriate, to take antihypertensive, lipid-lowering drugs and aspirin.[8]

After reviewing the above information about standardised methods available for identifying the risk factors for CAD, the present study was undertaken to assess the prevalence of risk factors in the community in Tripoli, the capital of Libya. The aim of this paper also includes suggesting priorities and strategy to deal with the risk factors that were found most important. Appropriate statistical tests were applied using the software SPSS 17 for determining the relative importance of different risk factors. The specific statistical tests have been stated below.

Material and Methods

528 individuals were selected from general community for the study by random sampling from different geographical areas of Tripoli. They were interviewed about risk factors for CAD and where possible, facts stated by them were validated from medical records available with them. Their body weight, height and blood pressure were also recorded. The intern doctors posted with community medicine department were briefed and trained by faculty members for the above observations and recording the body measurement and blood pressure using the uniform technique. The WHO/ISH risk prediction colourcharts for Eastern Mediterranean Region B (which includes Libya) were used as questionnaire for the study. The option of charts available for settings where blood cholesterol can't be measured was selected as it was found difficult to convince the individuals not suffering from disease to provide blood samples.

The following criteria were used for defining Blood Pressure, BMI, Diabetes & MI : According to the WHO definition, individuals with systolic blood pressure ≥ 140 mmHg or those with diastolic blood pressure ≥ 90 mmHg were considered hypertensive.[21.] Known cases of diabetes were termed as individuals for whom the diagnosis of diabetes had been established by a physician in the past, or those who were under treatment with anti diabetic drugs.[22] Body mass index (BMI) is calculated as weight divided by height squared (kg/m2). Overweight is defined as BMI 25–29.9 kg/m2, and obesity as BMI ≥ 30 kg/m2 for all subjects.[19] Known cases of Myocardial Infarction (MI) were termed as individuals for whom the diagnosis of MI had been established by a physician in the past.

Observations

The comparison of population characteristics of people with and without having a MI stated in the table below reveals that: distribution of males and females was similar in both the groups. 88% of individuals with a MI were from age group 35 and above. Whereas 11.43% of people with MI were from age group 15 to 34 years which shows the need of starting screening as well as control of risk factors from teenage.

Table 1 : Age & Sex wise distribution of persons with and without MI:

Characteristics	Individuals with MI in percentage, (N= 70)	Individuals without MI in percentage, (N = 458)
Sex; Male	68.57 (48)	68.78 (315)
Female	31.43 (22)	31.22 (143)
Age 15-34 years	11.43(8)	34.93 (160)
35-54 years	30.00 (21)	37.55 (172)
55 & above	58.57 (41)	27.51 (126)

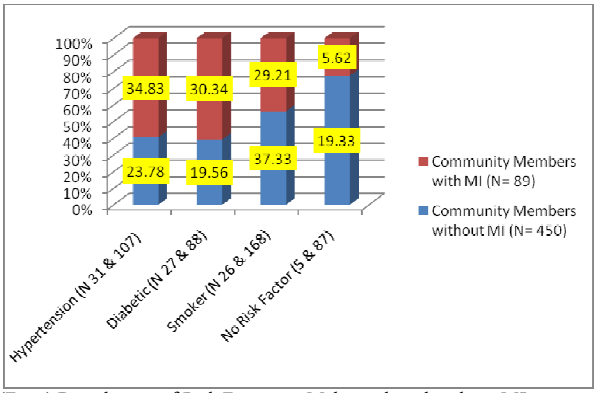
Using SPSS software, independent sample t test was applied on age distribution of individuals with and without history of MI. The result revealed that the mean age of individuals with a positive history of MI was 54. It was 43.74 for subjects with negative history of MI. The difference of age between the above 2 groups was found highly significant (P>0.001). In the same manner using SPSS software, Chi square test was applied on sex distribution of individuals with and without history of MI. The result revealed that the difference in sex distribution in the two groups was not significant (P = 0.522)

Independent risk factors

As presented in Fig.1, in males with MI in terms of percentage the most prevalent risk factor was found to be hypertension (11.05% higher than non MI group), followed by diabetes (higher by 10.78%), smoking (higher by 8.12%) and BMI 25 & above (higher by 5.13%). As presented in Fig.2, in females with MI in terms of percentage the most prevalent risk factor was found to be hypertension (20.55% higher than non MI group), followed by BMI 25 & above (higher by 8.77%) and diabetes (higher by 6.85%). There were no smokers in the female group with MI and only one smoker was found in the females without MI.

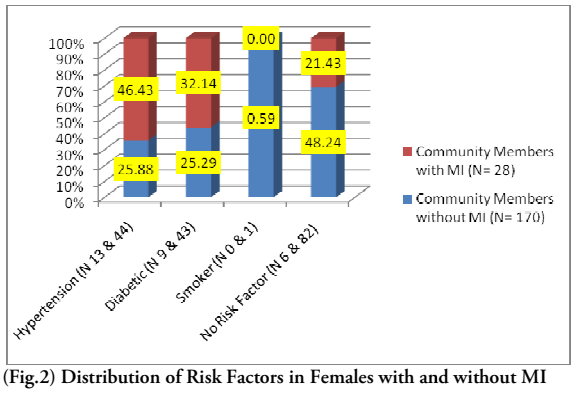
Using SPSS software, under general linear model, multivariate analysis was performed after splitting the cases under male and female. History of MI was kept as fixed factor and age, history of hypertension, diabetes and stroke, smoking, systolic blood pressure and BMI were kept as dependent variables. The results reveal that in the males with positive history of MI, value of P was less than 0.001(highly significant) for age, History of hypertension & diabetes and systolic BP of140 and greater, followed by history of stroke (P>0.002) suggesting that prevalence of these variables were significantly higher in males with history of MI. The prevalence of BMI 25 & above (P>0.616) and smoking (P>0.882) in males with history of MI was found insignificant. In case of females with positive history of MI, the only variable having significant prevalence was f history of hypertension (P>0.008). An important reason for inability to assess significance for other variables in females may be the smaller number of females of only 22 with history of MI.

Among the community members with MI, 94.38% males and 78.57% females had one or the other risk factor which have been stated above. Hence with focused attention to health education and screening for risk factors, identifying most of the individuals at risk of MI, should be possible.



(Fig.1) Distribution of Risk Factors in Males with and without MI

(The total number of responses are more than number of respondents because of more than one risk factor being present in many respondents)



(Fig.2) Distribution of Risk Factors in Females with and without MI

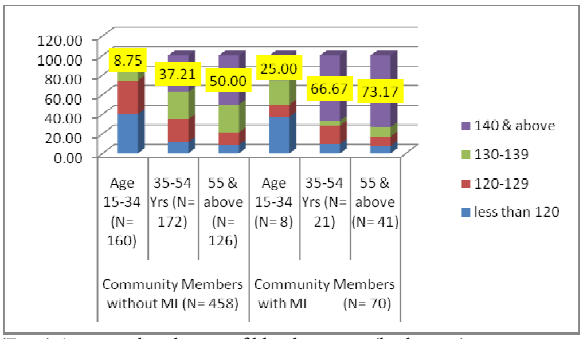
(The total number of responses are more than number of respondents because of more than one risk factor being present in many respondents)

Combination of risk factors

Out of 48 males with MI, 22 (45.83%) had both diabetes and hypertension and half of them (22.92%) were also smokers. The next group among males having multiple risk factors were that of smokers 14 (29.17%), out of which half (14.58%) also had hypertension. Out of 22 females with MI, 13 (59.09%) had hypertension and 27.27 % out of them were also diabetic. The next group was that of diabetics 3 (13.64%). Hence looking at the combination of risk factors in both males and females with MI the most common risk factor in terms of prevalence was found to be hypertension followed by smoking in men and diabetes in women.

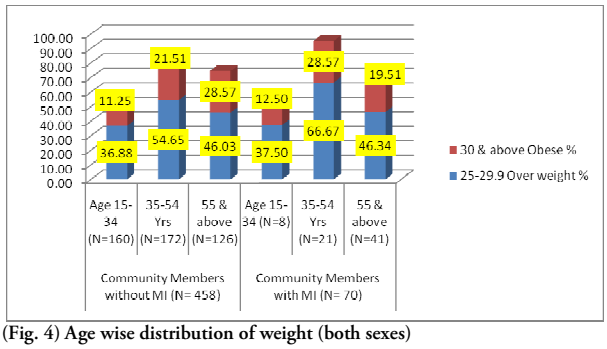
As Hypertension and BMI in age group of 35 to 54 years were found to be significant and commonly present risk factors, the data was further explored.

Systolic BP 140 and above: The percentage of persons with MI having a systolic BP of 140 and above in the age group 35 to 54 years was more than double in comparison to the percentage expected by number of persons present in this age group that is 66.67% as stated in Fig.3, against 30% as stated above in Table1. Hence in this age group there appears to be considerable opportunity of detecting and treating cases of hypertension in the general community before they reach to the advanced stage of coronary artery disease and MI.



(Fig.3) Age wise distribution of blood pressure (both sexes)

Body Mass Index: As presented below in Fig.4, the percentage of overweight and obese individuals were found to be 5 to 9 percent higher in those with MI than those without MI. The percentage of obese people increased by 2 times in both the groups that is with and without MI as age advanced to 35-54 years from 15-34 years. The percentage of overweight individuals was 1.48 times in those without MI and 1.77 times in those with MI in age group 35-54 years in comparison to the age group of 15-34 years.



(Fig. 4) Age wise distribution of weight (both sexes)

Discussion:

Comparison with other relevant studies: In our study the most common risk factors observed in community members without MI were hypertension (total 24.35%, males 23.78 & females 25.88), followed by diabetes (total 21.13%, males 19.56 & females 25.29) and smoking (Total 27.26%, males 37.33 & females 0.59) as stated above in Fig.1 & 2. In similar studies performed in countries of Mediterranean region[14-18] 26% of study population were found to be suffering from hypertension, 40% males and 13% females were smokers and 14.5% were suffering from diabetes.[13] The percentage of diabetics was 10.6 in study population aged 30 years and above in Iran[11]. The percentage of diabetics were 11% in males and 7% in females in United Arab Emirates (UAE)[10] and the figures were the similar in Saudi Arabia in subjects aged 30 years and above were 17.3% and 12.18% respectively.[9] All the above studies were performed in the period from year 2000 to 2004 except the study in UAE which was performed in 1995. It can be seen from our study in Libya that in comparison to mean percentage for the same risk factors in other countries of Mediterranean Region, the percentage of hypertension was lower by about 2%. In Libya the percentage of total diabetics in the general community was greater by 6.6%, while the percentage of smokers were less by about 13% in males and 12.5% in females.

The percentage of total overweight and obese individuals in all age groups and both sexes were 66.6 % in the general community without MI in our present study (Fig,4). The percentage for those overweight and obese in individuals above 19 years of age was 26.2% in study from Iran[12] and 27 % in UAE[10] in the age group of 30 to 64 years. The study of 12 countries of the Eastern Mediterranean Region(EMR) by the WHO conducted in 2004, reveals that regional adjusted mean for these countries was 43 % for overweight and obese individuals in all age groups and both sexes[20]. Hence in comparison to developing countries of the region having similar religious, social and dietary situation among the risk factors for CAD, diabetes and obesity can be seen as emerging major risk factors in Libya followed by hypertension and smoking. Smokers among females were found to be uncommon in Libya.

Conclusion

The findings of this study reveal that in comparison to those without MI the prevalence of following risk factors was higher in individuals with MI. In males aged 35 to 54, the percentage of those with a systolic BP of 140 and greater was more than double and in females 1.6 times greater. Those with diabetes were greater by 10.78% in males and 6.85% in females, while smokers were higher by 8.12% in males.

The percentage of diabetes in individuals without MI was 21.13%. The prevalence of smokers was found to be 37.33% in males without MI which suggests urgent need for prevention and control measures. Considering multiple risk factors out of 48 males with MI, 22 (45.83%) had both diabetes and hypertension and half of them (22.92%) were also smokers. Out of 22 females with MI, 13 (59.09%) had hypertension and 27.27 % out of them were also diabetic.

In view of large number of individuals having risk factors of CAD in Tripoli, we would like to recommend that health education for preventing overweight and obesity, hypertension, smoking and diabetes may be started with school children and their parents as early as primary school. The screening for above risk factors needs to be implemented in the age group of 34 years and above for detecting individuals at risk as close to 34 years as possible. This step needs to be followed by relevant health education and treatment as soon as possible. More studies on a larger population sample are required from different geographical areas of Libya to refine our focus on the target population identified. At the same time waiting for action, till these additional studies are completed, is not recommended. To make the comparison of risk factors more fruitful among different countries and in the same country over time, we need to agree on uniform criteria such as using WHO/ISH risk prediction charts.

Limitations of present study

It is a cross sectional study based on the questions stated in WHO/ISH prediction charts for situations where collecting blood samples is not feasible. Due to the small sample size we can only say that the prevalence of MI is indicative of the pattern observed. These figures may get refined as we cover a larger number of the population over time. Due care has been taken in selecting sample size to represent different geographical divisions of Tripoli and to ensure that this is a random sample, but it is a systematic random sample and not the stratified random sample. Hence within each geographical division all the socio economic strata of community may not have been proportionately represented.

Competing Interests
None Declared
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APPENDIX

The questionnaire used for the study is stated below. It is based on the questionnaire recommended on page 21 of WHO/ ISH risk prediction charts for Eastern Mediterranean Region B of W.H.O. in which Libya is included.

Questionnaire

Precautions: Do not interview persons below the age of 14 years. You should take height, weight and Blood Pressure of the person yourself, before recording it in the form below

S.N.	Question	Subject				
		1	2	3	4	5
1	Name of Person:					
2	Address in Libya					
4	Age					
5	Sex: M / F					
6	Do you smoke: Yes / No					
8	Do you have History of suffering from Diabetes: Yes / No					
9	Hist. of suffering from: Mayo cardial Infarction: Yes/ No					
10	History of suffering from Stroke: Yes / No					
12	History of suffering from Hypertension: Yes / No					
13	Height in Cms:					
14	Weight in Kg:					
15	Systolic Blood Pressure (in mm of Hg):					

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Research Article

BJMP 2010;3(2):325

Self-Medication Among Allopathic Medical Doctors in Karnataka, India.

Nalini G K

Abstract
The aim of the present study was to evaluate the self-medication of self-prescribed antibiotics among government doctors in the Hassan district. A close and open-ended questionnaire was used to collect data from a sample of 160 Government doctors, randomly chosen from Hassan district. Data was collected using a self assessing questionnaire. Data was entered and analyzed using SPSS 14 and the results were presented as a percentage. Out of 160 doctors only 97.5% filled and returned the questionnaires. Self-medication with antibiotics was reported by 53% of doctors during the cross sectional study at a CME programme in Hassan Institute Medical Sciences, Hassan within 6 months prior to the study. The main indication for self-medication with antibiotics was respiratory problems (73.3%) such as the common cold and sore throats. Amoxicillin was the most commonly used antibiotic (40%). The main source of medicines was drugs from medical representatives (47.8%, samples), drug stores (44.8%, self-prescribed) and the government hospital pharmacy (7.4%). Only 26.8% of antibiotic users completed the course. The prevalence of self-medication with antibiotics among doctors is high. Proper prescription writing is an essential skill for doctors in medical profession, as it is the primary intervention that doctors offer to the suffering humanity. Medical students learn the science of prescription from the Medical faculty. Hence educational programs are needed to improve potential problems of self-medication with antibiotics and to minimize the different forms of prescribing errors, by vigorous training programs.
Key words: self-medication, self –prescription, doctors, antibiotics, prescription.

Introduction

Antibiotics serve a very useful therapeutic purpose in eradicating pathogens[1,2]. Unfortunately excessive and inappropriate use of antibiotics results in antibiotic resistance which is a rapidly increasing global problem with a strong impact on morbidity and mortality [3-5]. It is now evident that self-medication is widely practiced in both developing [6-11], as well as developed countries [12-18]. India is also experiencing this problem of inappropriate use of self-medications in significant numbers [19,20].

Unlike the rest of the population, when physicians become ill, they can prescribe medicines for themselves very easily. Medical knowledge and access to prescription of medications increase the potential for self-treatment. Although many warn of the loss of objectivity that can accompany self-prescription, previous studies suggest that self-prescription is common among practicing physicians [21-24]. The purpose of the present study is to evaluate self-prescription and self-care practices among government doctors in the Hassan District of Karnataka.

Materials and methods

A cross section of doctors attending the CME programme at Hassan Institute of Medical Sciences, Hassan, was selected for the project during August 2009. A self –assessment questionnaire was distributed amongst the participants after explaining the purpose of the study and after taking informed oral consent. The study was given prior approval from the institutional ethics committee. A total of 160 doctors (all participants were male) were chosen randomly for participation in the study.

The questionnaire consisted of both closed and open-ended questions. A total of 21 questions were stated concerning the following: Socio-demographic characteristics (like age, sex and personal habits), patterns of self – medication with antibiotics (e.g. type of antibiotics used, frequency, whether the course of antibiotic was completed, and the health condition that lead to self-medication).

After completion of data collection, it was reviewed, organized and evaluated using the Chi-square test and analysis of variance (One-way ANOVA) using the Statistical Package of Social Science (SPSS Inc., Chicago, IL) for windows version 14 and p-value of <0.05 was considered statistically significant.

Results

A total of 160 male doctors agreed to participate in the study. Twenty eight percent of them were postgraduate qualified (e.g. MD, MS in different specialities) and 72% were only MBBS qualified. Eighty six percent of them were aged between 36-45 years.

Fifty three percent of doctors had used self-prescribed antibiotics with self-diagnosis within the last 6 months before the study.

Table – 1 Characteristics of the Respondents

Variables	Doctors %
Used self-medication with antibiotics	53.0
How many times	
Once / day	55.8
Twice / day	10.4
> 3 times	16.1
Completed the course	26.8

Table – 2 Factors that lead to Self-medication	
Conditions	**Doctors %**
Respiratory Infections	66.7
GI problems	23.4
Systemic Problems	7.7
Skin Problems	2.6
Urinary tract conditions	0

Table – 3 Antibiotics used for self-medication	
Name of the antibiotic	**Doctors %**
Penicillines	68.0
Amoxicillin	40.0
Flouroquinolones	13.3
Co-amoxiclav	6.8
Macrolides	8.0
Tetracyclines	2.7
Cephalosporins	4.0
Sulphonamides	2.2
Metronidazole	1.2
Tinidazole	2.0

The frequency of antibiotic use was once in 55.8%, twice in 10.4% and thrice or more in 16.1% in the study period ($p < 0.05$). Only 26.8% of all doctors attended in this study completed the course of antibiotic therapy ($p < 0.05$) (Table 1).

The factors that lead to self-medication among respondents were perceived respiratory infections in 66.7%, gastrointestinal diseases in 23.4%, systemic diseases in 7.7% and skin diseases in 2.6% (Table 2).

Table 3 shows the antibiotics that were most frequently used for self-medication. Penicillins were ranked highest (68%) and in this group Amoxicillin was most frequently used (40%). Next were the flouroquinolones with 13.3% followed by Macrolides 8%. Other relatively lesser used drugs were co-amoxiclav, cephalosporins, tetracyclines, sulphonamides, Tinidazole and Metronidazole.

Discussion

The current study examined antibiotic self-medication among government medical doctors in Hassan district. They were attending a CME programme at HIMS, Hassan. Studies on factors associated with antibiotic use are important to prevent the occurrence of antibiotic resistance [9], which is a well known problem in many countries [7-18]. Antibiotic use in different diseases was always empirical without proper opinion and laboratory investigation in self- medication.

The source of the antibiotics was from medical representatives (47.8%), from drug stores (44.8%) without prescription, even though antibiotics are prescription only medicines. The fact that the violation of this law is subject to financial penalty and is not strictly implemented in case of doctors, has resulted in the continuation of this practice. Self-medication with antibiotics may increase the risk of inappropriate use and the selection of resistant bacterial strains [25,26]. There have been several reports addressing the extent of self-medication practices with antibiotics among university students in other countries [27,28], but few about doctors. This should be further analyzed.

In this study, more than 53% of the respondents practiced self-medication with antibiotics within the last 6 months before the study. This rate is similar to the findings of a study in Turkey with 45.8% of self-medication with antibiotics [29] and also a recent study in Jordan (40.7%) [9] and other studies in Sudan (48%) [7], Lithuania (39.9%) [30] and also in USA (43%) [17].

Higher rates of self-medication are reported from China (59.4%) and Greece (74.6%) [14]. Lower rates are reported from Palestinian students (19.9) [27], Mexico (5%) [31], Malta (19.2%) [18] and Finland (28%) [12]. It seems that the lower rates of self-medication in these cases were due to respiratory diseases being treated symptomatically rather that with antibiotics.

Only 26.8% of respondents completed the course of antibiotic therapy. This is similar to the result of study in Jordan (37.6%) [9].

The most common disease treated by antibiotics was respiratory tract infections (common cold, sore throat, and sinusitis). Such diseases were also reported to be the common cause for self-medicated in Jordan [9,] Palestine [27], Turkey [28] and European countries [16]. The above conditions are known to be of viral origin [32], requiring no antibiotic treatment.

The main antibiotics used in self-medication were penicillins in general, and particularly Amoxicillin. Similar results are reported by other studies from different parts of the world [8,33]. This may be due to the low cost of broad spectrum penicillin throughout the world [8].

It is agreed by some researchers that adverse effects due to inadequate and inappropriate use of antibiotics without prescription can be minimized by proper education [34.] This can be effectively done through national awareness programmes, educational programmes (Rational Drug Use, Intensive Medical Monitoring of Prescription, evidence based practice, and essential drug use) and CME programmes.

We also suggest specific education about antibiotics in all educational and research institutions.

There are a few limitations in this study for all doctors irrespective of gender. First, is its reliance on self-reported data about self-medication with antibiotics. Secondly, it refers to any previous use of self-medication with antibiotics (retrospective study). Another limitation is that our population sample may not be representative of the doctors' population in the entire district. National education programmes about the dangers of irrational antibiotic use and restriction of antibiotics without prescriptions should be the priority. This study indicated that with reference to doctors, knowledge regarding antibiotics

cannot be evaluated alone since it did not always correlate with behaviour.

Conclusion

Almost all medical doctors practice self-treatment when they are ill. Although they prefer to be treated by a physician, due to complex reasons including ego and a busy professional work pattern, there is a certain amount of hesitation in consulting professional colleagues when they need medical help.

The prevalence of self medication practices is alarmingly high in the medical profession, despite the majority knowing that it is incorrect. We recommend that a holistic approach must be taken to prevent this problem from escalating, which would involve: (i) awareness and education regarding the implications of self medication (ii) strategies to prevent the supply of medicines without prescription by pharmacies (iii) strict rules regarding pharmaceutical advertising; and (iv) strategies to make receiving health care much less difficult.

Our study has also opened gateways for further research on this issue, besides showing that it is a real problem and should not be ignored in and around Karnataka, India and all over the world.

Acknowledgements
The author is grateful to Dr Gangadhara KS for permitting this study and Dr S. Parameshwaraiah for the technical support.
Competing Interests
None Declared
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Research Article

BJMP 2010;3(2):315

A Cross-Sectional Study of Men with Genital Piercings

LaMicha Hogan, Katherine Rinard, Cathy Young, Alden E. Roberts, Myrna L. Armstrong and Thomas Nelius

Abstract

Purpose: More men with genital piercings (GP) are presenting to health care facilities, yet a paucity of medical literature exists about their body modifications, health issues, and medical needs. Historically, they have turned to a piercer or the internet for medical advice which may put their health at risk by receiving inappropriate guidance or delayed treatment by an experienced, well-informed clinician.

Methods: A comparative, descriptive cross-sectional study was conducted using an 83 item web-based survey.Demographics, risk behaviours, procedural motives, and post-piercing experiences about men with GP were examined, as well as depression, abuse, self-esteem, and need for uniqueness. Similarly published studies were also compared.

Results: 445 men from 42 states and 26 international sites reported 656 genital piercings. The average participant was 36 years of age, Caucasian, possessing some college education, married or in a monogamous, heterosexual relationships, and in excellent health. Deliberate decision-making was present: 36% chose a Frenum/Frenum Ladder GP and 56% chose a Prince Albert GP, with 25% experiencing urinary flow changes. Outcomes were related to their motives: sexual expression, uniqueness, and aesthetics, with improvement of personal and partner's sexual pleasure.

Conclusions: Several unsubstantiated assumptions about men with GP were challenged regarding the amount of STDs, GP complications, and overall demographics. Currently their GP care information is still obtained from a piercer or the internet. Clinician awareness of GP is important to educate and inform adequately, give professional advice, and provide a realistic picture of structural complications.

Keywords

male genital piercings, need for uniqueness, self-esteem, depression

Abbreviations

STD= sexually transmitted disease; GP = genital piercings

Introduction

Humans have always been interested in altering their body. Whether through piercings or tattoos, for aesthetics, religious reasons, or self-expression, the practice of body modification is a well known art.[1] One not as familiar or easily observed body modification type is genital piercings. Genital piercings (GP) are defined as developing a tract under the skin with a large bore needle to create an opening into the anatomical region for decorative ornaments such as jewelry.[2-3] Historically, GPs are not a new procedure.

Currently, this once taboo practice is on the rise and more men with GP are presenting with a variety of medical needs to clinics and hospitals.[3] From the rare Pubic Piercing (a piercing through the dorsal base of the penis) to the Guiche (a piercing through the perineum), the male genitalia provides ample area to pierce. Men commonly choose from nine different types of GP and often use three major types of piercing jewellery (Figure 1).[3-6]

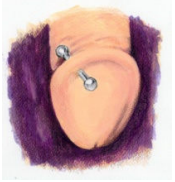
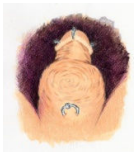
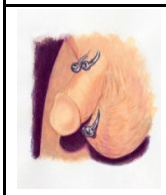
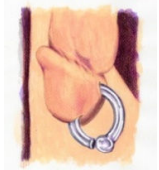
This rapid growth trend is creating its own set of complications and questions among clinicians. The medical literature suggests the most common risks are infection and bleeding, but there are other structural considerations as well.[3-4, 6-8] An example of this is with the most widely known and commonly encountered male GP, the Prince Albert; the jewellery pierces the urethral meatus, exiting through the ventral surface of the penis. The piercing effectively creates a fistula for urine to drain, and many men report experiencing the need to sit down during urination due to the change in stream and difficulty in aiming.[3,4] Other reported single case histories of more severe complications are Fournier's gangrene, urethral tears, priapism, post-coital bleeding or lost jewellery in female partners, paraphimosis, and recurrent sexually transmitted diseases.[8-20]

Given the variety of negative issues that could arise from GP, any subject related to the health and well being of men having an intimate piercing should be directed to a well informed clinician. Currently, when questions or problems arise, men are more likely to seek assistance from the internet or a piercer rather than a health care provider.[3,21-22] Considering the limited medical literature, as well as the minimal availability of clinicians knowledgeable about body piercings and modifications, men with GP are at high risk for delays in appropriate treatment of complications related to piercings as well as for overall preventive healthcare. Over concentration on the presence of GP by clinicians could delay important health care.[23]

Our purpose for this study was to elucidate information about men with GP in order to aid the clinician in providing relevant information for patients considering GP, as well as to provide

further scientific evidence by examining their demographics, risk behaviours, procedural motives and post-piercing experiences.

Figure 1 Common Types of Genital Piercings (GP) Worn by Men

Figure	Description4,39-41
	Ampallang ("crossbar") & Apadravya: Neither are common. Ampallang is placed horizontally, through the center of the head of the penis. The Apadravya is placed vertically, through the penis shaft, behind the head, between the frenulum to the top of the glans and traversing the urethra. Can produce heavy bleeding following procedure. Healing time 2-8 months.
	Dydoe: Involves single or multiple rings through both sides of the glans rim on circumcised men. Origin might be Jewish. Healing time 2-4 months.
	Foreskin: A piercing, usually done on both sides of the foreskin of uncircumcised men and closed with rings, deliberately making intercourse difficult. Healing time 1-2 months.
	Frenum or Frenum Ladder: Easy to perform and not as painful. This is a frenulum piercing, or a large ring can be placed around the head of the penis in the groove around the glans. The Frenum Ladder is a variation where multiple barbell piercings are placed down the midline of the penis. Also called Jacob's Ladder. Healing time 2-3 months.
	Guiche: Done between the scrotum and anus, behind the testes, usually corresponds above the inseam of pants. Healing time 3-4 months
	Hafda & Pubic Piercing: Pubic is a dorsal based piercing that does not pierce the penis, sometimes nicknamed "Rhinoceros Horn", whereas the Hafada does not penetrate the scrotal sac, not considered painful and is more a decoration. Actual piercing is placed somewhere the scrotum and penis. Healing time 2-4 months.
	Prince Albert: Most common male GP, jewellery is inserted through the external urethra and out the base of the frenulum. Easy to pierce and heal. Healing time is 1-2 months. Is said to "offer intense urethral stimulation during intercourse." Reverse Prince Albert exits the dorsum of the penis.
	Three major types of piercing jewellery for GP. Placement dictates the gauge of the jewellery.

Illustrations by Larry Starr, Senior Design Specialist Texas Tech University Health Sciences Center. Text modified with permission: Urologic Nursing 2006, 26(3), 175-176.

Additionally, several motives or characteristics of those with body art such as depression, abuse, self-esteem, and need for uniqueness were examined.[24-29] Authors of this study have experience in urology, various aspects of piercing, and two decades of published body art research.

Problems in attempting any study about those with GP is reaching a sizeable sample for a study and an acceptable data collection methodology as those with GP have a hidden variable of study, making it difficult to make contact. Networking or "snowball" sampling for data collection, as well as anonymous questionnaires, becomes one approach,[30] but this also makes it difficult to validate if respondents actually have GP. In an effort to address this issue, survey questions were specifically written for individuals with GP, making it extremely difficult and time-consuming to answer if the respondents did not have applicable experiences. Previous research experience also indicates that after about 10-15 questions, interest can wane and the questionnaire will not be completed.[3,7,31]

Only two published studies could be located to provide preliminary information about individuals with GP.[21,22] In the first study[21] data, collected in 2000 and actually published in 2005 had a national convenience sample of 63 women and 83 men with nipple and/or GP. Forty-eight men in the study had GP; the average man was 31 years of age, single, heterosexual, Caucasian, in good-excellent health, who sought out annual physicals, possessed some college education, and spoke of moderately strong religious faith. Almost all were employed, reporting an average annual salary of $36,000, or higher. Over half admitted and continued their belief they were risk takers; many of them also had 3 or more general body piercings. Most did not smoke or use drugs routinely and in this study, no questions about alcohol use were asked. Their average age at first sexual intercourse was 15.7 (the national male average is 16.9).[32] Of those that participated (37%) in sport activities or exercise, they reported with no problems. They voiced minimal, if any, regrets to obtaining a genital piercing and would repeat the procedure. The Prince Albert was the most common male GP. Few (12%) voiced any problems with their GP, with urinary flow changes and site hypersensitivity being the most frequently mentioned. Six participants stated partners had refused sexual intercourse with them after their GP. One case of STD (Gonorrhoea) was reported post-procedurally.

In 2008, data were collected for a second study involving women with GP.[22] This time the collection methodology took advantage of young adults highly routine usage of the world-wide internet and combined this with a successful, accessible networking sampling software entitled SurveyMonkey© (Portland, OR). The average woman with GP participant in the 2008 study (N = 240) was 32 years of age, Caucasian, heterosexual, married, in excellent health, who sought out annual physicals, participated in athletic activities, had an Undergraduate or Graduate Degree, reported few other friends with GP, and had 3 or more general body piercings. Their

average age at first sexual intercourse was 15.9 (the national female average is 17.4).[32] Many of the women reported themselves as risk takers and most believed they continue to have those ideas. Most did not smoke or use drugs routinely and their alcohol intake was infrequent, but when they consumed alcohol, they reported consuming 5+ consecutive drinks. They voiced minimal, if any, regrets to obtaining a genital piercing and reported that they would repeat the procedure. Only a few cited any problems, with site sensitivity as the most frequently mentioned health problem. No bleeding, rips, tears, or STDs were reported following their GP and no one had refused sexual intercourse with them. Additionally, an adjoining survey of 60 health care providers (physicians, registered nurses, midwives) who had previously cared for women with GP were queried; their viewpoints regarding women with GP and STDs, GP complications, and general concerns produced no major deviations of data from what was previously described.[22]

METHODS

Design

As the internet survey demonstrated marked success in reaching those with GP, a similar study was undertaken to query a larger cohort of men with GP to increase clinician awareness in caring for men with GP. Thus, a cross-sectional descriptive study of men with GP was conducted so the collected information could be compared with the previously mentioned studies of those with GP.[21,22] To ensure that the rights and dignity of all research participants were protected, exempt study status was obtained for this study from the university institutional review board. Notices of the study and a request for participation were posted on a number of popular body piercing sites with the assistance of an internationally-known Expert Piercer. The survey was available on the web for a total of 6 months during late 2008 and early 2009.

Questionnaire

Questionnaire items were based on a review of literature, the Armstrong Team Piercing Attitude Survey,[31] previous work examining women with GP, [3,21-22, 33] and recent findings about those with body art. [24-29] The study purpose and benefits were presented on the front page of the survey. The subjects were informed that completion of the survey indicated their consent to participate in the study and that they could stop at any point during the survey if they were uncomfortable with a question (s). Ethnicity was included to note GP acquisition patterns; the ethnic categories were not defined and participants self-reported. Assurances were provided that the information would be analyzed as group data and no identifying information would be sought. Respondents were encouraged to answer questions honestly and not to be offended by any questions as some of them directly related to unsubstantiated assumptions written about GP in the medical literature. [21-22] There was no ability to tabulate how many individuals viewed the survey if they did not start the survey.

The survey had 4 sections: (a) Obtaining the GP (13 questions); (b) Personal experiences with the GP (32 questions); (c) General information including depression and abuse (26 questions), and (d) Sexual behaviour including forced sexual activity (12 questions). Four scales were also included: motives (14), outcomes (16), pre and post procedural self-esteem (16), and need for uniqueness (4). The previous reliabilities for the motive scale was 0.75,[22] outcome scale 0.88,[22] and need for uniqueness scale was 0.80;[25] data was not available for the self-esteem scale.[34] Various response formats were used throughout the survey such as a 5 point Likert scale (1 = strongly disagree or unlikely to 5 = strongly agree or likely), multiple choice, and short answers.

Data Analysis

The Statistical Package for the Social Sciences (16.0 Ed.) was used for data analysis to obtain frequencies, cross-tabulation, and chi-square analysis.[30] Additionally, T-tests were used to compare means of similar questions from both the 2005 and 2008 studies with data from the current study. Significant differences were found in both study samples so they were judged as different groups from this current study.

RESULTS

Study Population

While 545 respondents started the survey, responses were analyzed from 445 men with GP (82%) residing in 42 states and 26 international countries; they declared a total of 656 piercings. Clusters of participants were evident from CA (22), NY (17), TX (16), FL (11), Europe (43), Canada (21), and Australia (20). Ages of the men with GP at survey time ranged from 15 to 72 (Table 1). The average participant in this study was 36 years of age, Caucasian, some college education, married, in excellent health, who sought out annual physicals, reported no/few friends with GPs, and declared a salary of $45,000 or higher. Religious beliefs were grouped into either non-existent or moderately to very strong faith. There was almost equal numbers of blue collar and white collar workers: others were from health care, arts, academia or military, while some were self-employed; very few mentioned unemployment, or retirement.

Risk Behaviours

Those who reported pre-procedural risk taking tendencies continued to have significant tendencies for them post-procedurally ($\chi^2 = 2.13) = 16$; $p = 0.000$) (Table 2). Some risky behavior was observed; over half had body art, with an average of 2 piercings or more, as well as tattoos. Alcohol use was infrequent, but when they did, they had 5+ drinks. Other answers did not bear out the risk taker image with their

monogamous, heterosexual relationships, limited tobacco, and drugs. Their average age at first intercourse was 17.05 (national male average 16.9).[32] Most (391/88%) did not report STDs before their piercings, but of those that did itemize their STDs, Chlamydia was the most frequently mentioned (n =18).

Table 1 Self-Reported Characteristics Of Men with Genital Piercings (GPs)

Demographics	Current Study* N = 445
Age at time of survey	
20 or <	61/29%
21-35	77/36%
36-50	41/19%
51+	33/16%
Ethnicity	
Caucasian	319/89%
Martial Status	
Single	96/27%
Living/significant other	69/20
Married with/out children	143/41%
Education	
High school Diploma	34/10%
Some college	113/32%
Bachelor's degree	77/22%
Graduate/Doctoral degree	88/20%
Occupations	
Technical/vocational	90/28%
Professional	92/29%
Students	44/14%
Artists	23/07%
Salary	
<45,000	135/44%
$45,000+	169/56%
Strength/Religious Faith	
Non-existent	135/39%
Mod Strong-Strong	99/28%
State of Health	
Excellent	310/88%
Health care visits	
Annual physicals	150/43%
Only when problems	142/40%
Close friends w/GPs	
None	239/68%
1-3	100/28%
4+	14/ 4%
Feel sad/depressed	
Little/Some	
Pre-piercing	248/57%
Post-piercing	210/59%

*Numbers will not always add up to 100 because of missing data or multiple answers.

Genital Piercing Procedure

A deliberate time delay between their consideration to making the decision to have a GP was present as many had waited almost 5 years before procurement (Table 3). Over half reported the Prince Albert GP, with another third choosing a Frenum/Frenum Ladder (Figure 1). While a small-moderate amount of pain and bleeding was reported procedurally, virtually no drugs or alcohol were used before their GP.

Table 2 Self-Reported Risk Behavior From Men with Genital Piercings (GPs)

Risk Behaviour	Current Study* N = 445
Age at first intercourse	
Never had intercourse	12/03%
12 or less	14/04%
13-15	80/25%
16-18	160/48%
19+	74 /23%
Sexual Orientation	
Women	286/82%
Risk Taker Before Piercing	222/52%
Remains Risk Taker	198/52%
Cigarettes Smoked	
None	252/75%
½-1 pack daily	75/22%
Monthly Alcohol Consumption	
1-3 times	118/33%
5+ drinks @ one setting, 1-3x	191/55%
Drugs Used monthly	
None	294/87%
1-15 times	27/08%
Sexual Partners in 6 months	
One	211/62%
Two or more	98/32%
General body piercings	
None	119/27%
1-4 piercings	259/59%
5+ piercings	108/33%
Tattoos	
None	115/35%
1-4	134/38%
5+	76/21%
STDs before piercing	54/12%

*Numbers will not always add up to 100 because of missing data or multiple answers.

Table 3 Self-Reported Procedural Information From Men with Genital Piercings (GPs)

Genital Piercing procedure	Current Study* N = 445
Amt of decision time	
Waited long time, then a few minutes	49/24%
A long time (over a year)	143/37%
Age of GP Decisions	
Consideration	29 years
Procurement	34 years
Type of Genital Piercings	
Ampallang	35 08%
Apadavya	46/10%
Dydoe	27/06%
Foreskin	27/06%
Frenum/Frenum ladder	160/36%
Guiche	32/07%
Hafada	43/10%
Prince Albert	248/56%
Other	38/09%
No Drug/alcohol at piercing	364/94%
Small-mod amt of pain	292/75%
Small-mod amt of bleeding	274/71%

*Numbers will not always add up to 100 because of missing data or multiple answers.

Table 4 A Three Study Comparison Of Self-Reported Motives and Outcomes From Those Wearing Genital Piercings.

Variable	Caliendo et al, 2005 Study: Data Collected 2000 Men with GPs N = 48*	Young, et al, 2010 Study Data collected 2008 Women with GPs N = 240*	Current Study Data collected 2009 Men with GPs N = 445*
Motives for their genital piercing	34/71% "Just wanted one" 24/50% "Trying to feel sexier" 23/45% "For the heck of it" 18/38% "Wanted to be different" 18/38% "Make myself more attractive" (alpha 0.40)	163/70% "Just wanted one" 120/51% "Trying to feel sexier" 111/48% "More control over my body" 93/40% "Seeking uniqueness" 91/39% "Make myself more attractive" (alpha 0.75)	196/90% "Just wanted one" 73/60% "For the heck of it" 67/60% "Trying to feel sexier" 56/58% "More control over body" 51/56% "Seeking uniqueness" (alpha unobtainable)
Outcomes of their genital piercing	36/77% "Improved my sexual pleasure" 35/73% "Helped express myself sexually" 35/73% "Helped me feel unique" 29/62% "Improved partner's sexual pleasure" 27/56% "Helped express myself" (alpha 0.89)	176/76% "Helped express myself sexually 173/75% "Improved my sexual pleasure 157/68% "Helped me express myself 134/58% "Helped me feel feminine" 134/58% "Helped me feel unique" (alpha 0.88)	278/81% "Improved my sexual pleasure 234/71% "Helped express myself sexually" 218/67% "Helped me feel unique" 229/67% "Improved partners sexual pleasure 211/64% "Helped genital look better" (alpha 0.88)

*Numbers will not always add up to 100 because of missing data or multiple answers

Motives and Outcomes

Table 4 illustrates participant motives and outcomes for each group in the various GP studies.[21,22] For the highest motive response of "just wanted one" there was consistency over the three studies; of the top five responses, they were similar but just ranked differently. Alpha measurements for the motive response scale ranged from 0.40 to 0. 75 except for our current study, where the covariance matrix was zero or approximately zero so the statistics based on its inverse matrix could not be computed. Motives centered around wanting a GP, trying something new, have more functional sexual control, and seeking uniqueness. Measureable outcomes (Alpha range 0.88-0.89) of their GP evolved around their sexual expression, uniqueness, and aesthetics, as well as the improvement of their personal and partner's sexual pleasure. In review, their motives for the GP were met in their stated outcomes.

Post-piercing Experiences

The men reported continued satisfaction with their GP and would repeat the procedure. While not many were engaged in exercise/sport activities, those that did, were active (Table 5). A few reported partner refusal of sexual activities when their GP was in place. Almost half reported no piercing complications; of those that did, only 2 major problems were cited. First, with over half reporting Prince Albert piercings, it was not surprising that 25% discussed changes in their urinary flow. Site hypersensitivity was the second most reported problem (23%), otherwise there were no further trends of other severe complications. While 80 (18%) reported STDs after their GP, only 19 itemized the specific type: the most responses were Chlamydia (9). Those that had a history of STDs (Table 2 & 5) before their piercings were significantly more likely to have them post-procedurally ($\chi^2 = 11.5) = 1$; $p = 0.001$).

Table 5 Self-Reported Post Procedural Information From Men with Genital Piercings (GPs)

Post Procedural Experiences	Current Study* N = 445
Have had partners refuse sex	38/10%
**Reported STDs since piercing	80/18%
Still like genital piercing	334/87%
Would do it again	358/93%
Sports/exercise involvement	
None	366/82%
Jog/ride bike/exercise, etc	79/18%
Complications from piercing	
No problems	209/47%
Change in urinary flow	109/25%
Site hypersensitivity	101/23%
Skin irritation	30/07%
Rips/tears at site	30/07%
Problems using condoms	24/05%
Keloids @ site	16/04%
Site infection	11/03%
Urinary tract infection	7/02%
Site hyposensitivity	70/2%
Sexual problems	401%
Jewellery embedded	4/01%
Erection problems	4/01%
Other, not named	18/04%

*Numbers will not always add up to 100 because of missing data or multiple answers.

Depression, Abuse, Self-Esteem, and Need for Uniqueness

Four additional characteristics about individuals with GP were examined.[24-29] Men with GP respondents reported a small amount of "sad or depressed feelings"; those that had these depressed feelings before their piercings were significantly more likely to continue these depressed feelings post-procedurally ($\chi^2 = 4.1$), $= 16$; $p = 0.00$). Only 5 (1%) reported being forced to

participate in sexual activity against their will, while a few cited (56/12%) physical, emotional, or sexual abuse.

To extract a profile of self-esteem, 8 questions were asked in the pre and post piercing survey sections; internal consistency (Cronbach alpha) of both scales was 0.75. Their responses to both the pre procedure (M = 22.3, SD = 4.51) and the post piercing time (M = 23.1, SD = 3.97) was highly correlated at 0.79 (P <0.01). Two statements triggered split, negative and positive responses with "I make demands on myself that I would make on others" and "I blame myself when things do not work the way I expected." Lastly, their Need for Uniqueness (NU) was asked using a four item scale[24,25] in the pre-piercing survey section. When all five responses of the scale were totaled (20), the mean was 11.3 documenting a more positive perspective about their GP, close to the moderate level (Cronbach alpha 0.86), for intentionally wanting to be different, distinctive, and unique. When asked if their overall feelings of NU had changed since obtaining their GPs, those that had NU before their piercings were significantly more likely to have them post-procedurally (χ^2 = 11.5) = 16; p = 0.03).

DISCUSSION

When examining this data from men with GP alongside the 2005 published study,[21] the cohort almost equalled 500 participants. To our knowledge this is the largest repository of data currently available to provide further evidence of the demographics and health issues regarding men with GP. The anonymous data, obtained by networking sampling and accessible, economical web-based survey, could be viewed as a study limitation. Yet, finding similarities between this data and data collected almost ten years ago suggests that our findings tapped into a core body of knowledge about men with GP. Similar data, obtained at different times, from different respondents increases the credibility and lends the information to further generalizability to influence use in practice.[30]

The "social reality" [2] of the GP phenomenon is here. All of the men had one type of GP, and some had multiple GP, and many had other general body piercings.[35] Awareness of the current types of body modification including GP will help the clinician educate and inform adequately, to give professional advice, and also provide a realistic picture of structural considerations. Respondents stated their GP were an important and satisfying part of their life, they still liked them, and would repeat the procedure; the GP improved their sexual activities, few refused sexual intercourse, those that exercised were active, and they were not troubled by the GP complications. From a medical standpoint the insertion of a GP could be considered a minor surgical procedure, and yet the data suggests that when the GP is performed by experienced hands only minimal side effects are reported. Thus, finding a knowledgeable, expert piercer is an important educational theme. However, patients need to also be aware that certain types of piercing may require some behavioral changes such as toileting and consistent body cleaning. Unfortunately virtually no health care providers, including clinicians, were mentioned in the GP decision making process or care, they usually went to the internet or returned to a piercer for information.[21,22] Hopefully, as more clinicians are made aware of GPs, those who are considering GP will find their physician to be a helpful and more informative resource.

These study participants with GP were older, well-educated men, often in a stable relationship, different than what is usually thought about people with body piercings.[7, 22,26-27,29,31] This scientific evidence about their overall demographics pose challenges to the current medical literature. Sample demographics from this study and the other two cited GP studies [21,22] do not reflect individuals from stereotypical low performing social and economical backgrounds. Demographically, the people with GP were in their early thirties, Caucasian, heterosexual, well educated, employed, in good health, with some religious beliefs, but not ethnically diverse. In contrast to literature describing men with GP as antisocial miscreants or mostly homosexual, [2,4,18] our data support that these men are more part of the mainstream culture. The avoidance of "rushing to judgment"[28] is an important aspect, especially in the way they are often perceived.

Men with GP did not deny their propensity to be risk takers, but being a risk taker was not synonymous with being deviant, but more with achieving individualization.[21,28,31] Threads about stable relationships were provided throughout their information, including sexual orientation, marital status, GP complications, and even their lack of many risk behaviours. Their first time for sexual intercourse was close to the male national average. While procurement of any type of body art is thought to be impulsive [7,21-23], their time for GP decision-making was deliberate, as well as their practice of on-going, conscientious care of their piercings.[21,22] Absence of alcohol and/or drug consumption before the GP procedure has been a frequent finding in other body art studies.[7,21-22,31] Reputable piercing artists advocate for no use of alcohol and drugs as they want their customers to be making realistic procedural decisions about their GP and listening carefully to post GP care instructions.

The unsubstantiated assumptions in the literature about GP complications such as male infertility, scrotal infections, reduction of erotic stimulation, and frequent infections with bicycle rides were also challenged.[6,21,36-40] Overall, only two problems of urinary flow changes and site hypersensitivity were reported with their GP. They took their sexual concerns seriously, as part of their internal influences of self esteem and their need for uniqueness. Their documented motives reflected sexual enhancement, aesthetics, as well as uniqueness. Their stated outcomes of the GPs reflected an ability to better express themselves sexually and create a sense of uniqueness; these elements obviously took precedence over the two problems of urinary flow changes and hypersensitivity. Both these motives and outcomes were similar when compared with the other two

studies.[21,22] Further procedural research is suggested to obtain more information about the reasons some with Prince Albert GP have urinary flow changes, while others do not, to eliminate this as a possible side-effect.

Negative bias continues with the assumption that individuals with GP frequently have STDs.[18-20, 36-40] Historically, concern for those who have "exotic adornments" such as body piercings have led some health facilities to require STD screening, no matter what the nature of the presenting complaint.[22,35] Yet, in this study and the other two related GP studies,[21,22] respondents reported only a few STDs. Their reporting incidence of STD was low compared to the national Guttmacher Institute report of one in three sexually active people will have contracted a STD by age 24.[32] As in this study, Chlamydia remains the most highly reported STD in the US.[32] While it is important to always conduct a thorough sexual history, [20] perhaps the conscientious care related to the deliberate decision for the GP, and the mostly monogamous relationships reported may account for the limited reporting of STDs. One STD clinic study found that neither socioeconomic status, method of contraception, multiple partners, or the presence of genital infections correlated with GP.[38] Further longitudinal research is suggested to examine the long-term effects of GPs, as well as further GP complications and STD prevalence.[19]

Men, like women, with GP[21] reported depressed feelings[26,27,29] both pre and post procedure, but gender differences were present with abuse and forced sexual activity. The men with GP reported few incidents of abuse (emotional, physical, or sexual) or forced sexual activity against their will whereas over a third of the women with GP[22] reported this. Although women frequently spoke of their use of GPs to take more control in reclaiming their body to "free them from the bonds of molestation and give them strong feelings of empowerment," [22] men verbalized their use of GPs to give them more sexual control.

STUDY LIMITATIONS

As with any study, several limitations to generalizability of data must be considered and one of methodology has been previously discussed. This was a non experimental, descriptive study design and the respondents self-selected to complete a web-based survey. Bias, inaccurate recall, and/or inflation can result from self-reporting.[30] Respondents had to use their personal judgment to interpret questions with the use of an anonymous survey so socially desirable responses could have been entered. Participants with strong negative or positive feelings may have been more likely to complete the survey. Yet, as random sampling is almost impossible in a population with hidden variables, and in spite of these limitations, the respondents did contribute further quantitative data.[21,22]

CONCLUSIONS

The trend of those obtaining GP continues to increase and is not limited by age, gender, socio-economical backgrounds, or sexual preferences. Many in this study still reported seeking advice of a piercer or the internet. As an identified population at risk for quality health care, further evidence of demographics, piercings and jewellery, motivations, outcomes, and health issues were presented about men with GP so clinicians can provide clinically competent and applicable approaches for care. The collective data examined here, along with some collected almost ten years ago, begins to dispel some of the negative assumptions about this segment of the body modification population regarding their overall demographics, GP complications, and STD prevalence.

Acknowledgements
The authors acknowledge the support and manuscript reviews of Bernhard T. Mittemeyer, Elayne Angel, Jerome Koch, Joanna Guenther and Scott De Boer.
Competing Interests
Funding in part by the Texas Tech University Anita Thigpen Perry School of Nursing Research & Practice Committee.
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Review Article

BJMP 2010;3(2):316

Postpartum Sexual Dysfunction: A literature review of risk factors and role of mode of delivery

Ahmad Sayasneh and Ivilina Pandeva

Abstract

Female sexual dysfunction (FSD) is a serious morbidity which could occur postnatally. It is important for different members of staff (GP, midwife, obstetrician, nurse, psychosexual therapist) to be aware of this problem and its various implementations.

Objectives of the review: The main scope of writing this review is to try to categorise the different forms of postpartum sexual dysfunction, and to assess the risk factors involved, with a focus on the different opinions in literature regarding the role of mode of delivery (vaginal or by caesarean section) in alleviating or aggravating the problem.

Search strategy: the National Health Library electronic database was searched, including all resources. Only studies discussing the risk factors of PPFSD after vaginal birth were included. Perineal pain as a complication after episiotomy or tears was differentiated from dyspareunia, and studies on perineal pain after delivery were excluded from the review if they did not discuss the effect of the pain on sexual activity. A meta-analysis was performed to summarise the outcome of the different studies comparing the effect of modes of delivery on PPFSD.

Author's conclusion: episiotomy is an important risk factor for short term PPFSD. However, there is little evidence to support a possible long term effect. Breastfeeding, use of progestogen-only pill and the lack of postpartum sexual health counselling and treatment are other significant risk factors for PPFSD. There is insufficient evidence to advocate a decision of performing a caesarean section on basis of alleviating PPFSD.

Keywords

Postpartum Female Sexual Dysfunction (PPFSD), dyspareunia

Introduction

Female sexual dysfunction (FSD) is a serious morbidity which could occur postnatally. It may lead to a variety of physical, psychological, and social adverse effects on the patient. Moreover, the consequent cycle of fear might compound the initial sexual disorder and makes it more difficult to treat. Therefore, early diagnosis and management of the problem become essential to avoid later sequalae on reproductive and sexual life. However, early diagnosis may be challenged by many factors. For example, many patients will be preoccupied by the newborn or embarrassed of talking about sexual matters after delivery, which makes it very important for the midwifery, medical, or other staff to raise the issue during the postnatal care sessions. The staff, on the other hand, might feel uncomfortable to discuss the sexual function with the client, or even may lack the knowledge and skills required for sexual health counselling. In addition to the client-service gap, there are gaps between different sexual service providers.

There are many types of postnatal sexual disorders. These types can differ widely in clinical features and management. Additionally, management of postpartum female sexual dysfunction (PPFSD) can vary with clinician's experience. There are very few randomised clinical trials on treatment for PPFSD, which partly explains the service-service gap in PPFSD management.

In the last three decades there has been an increase in caesarean section rate in the developed world due to many maternal and fetal indications, especially with the significant improvement in surgical and postoperative care. Recently, more attention has been paid to the positive role the caesarean section may play in protecting the female pelvic floor from birth trauma. Perineal birth trauma has been accused by many authors of adversely affecting the female sexual well being.[1] On the other hand there is a growing opinion that the quality of postnatal sexual health is unrelated to mode of delivery.[2] The previous two contradictory statements from literature illustrate the real size of the dilemma when we try to counsel a woman requesting a caesarean section as she is worried about sexual dysfunction after vaginal delivery. This problem might become more difficult to solve if the woman already suffers from a sexual disorder (for example: dyspareunia) in the antenatal or preconception period.

Female sexual dysfunction is impaired or inadequate ability of a woman to engage in or enjoy satisfactory sexual intercourse and orgasm. There are certain natural events in a woman's life when she is at increased risk of developing sexual dysfunction, such as the use of contraception pills, menstruation, postpartum and lactation status, perimenopause, and postmenopause. This could be related to fluctuations in

gonadal hormone secretion, making women more vulnerable to sexual symptoms.[3]

Postpartum female sexual dysfunction (PPFSD) is a common health problem with different incidence reported in literature. Xu et al reported an incidence of 70.6% of PPSFD in the first 3 months after delivery falling off to 55.6% during the 4th-6th months, and reduced to 34.2% at the 6th month, but not reaching pre-pregnancy levels of 7.17%. [2]

For the purpose of this piece of writing, the classification of sexual dysfunction put forth by the American Psychiatric Association APA (1994) in the Diagnostic and Statistical Manual, 4th Edition (DSM-IV) is used to help understand the differing presentations of PPFSD. [4] The main postpartum female sexual dysfunction categories are: sexual desire dysfunction (Hypoactive Sexual Desire Disorder), sexual pain disorders (which includes dyspareunia, vaginismus. and vulvodynia), sexual arousal disorder, and female orgasmic disorder.

To help in understanding this classification better, it is important to refer to the early research done in this field by Masters and Johnson in 1966. One of the most interesting findings of the latter has been the four stage model of sexual response, which they described as the human sexual response cycle.[5] They divided the human sexual response cycle into four stages: Excitement phase (initial arousal), Plateau phase (at full arousal, but not yet at orgasm), Orgasm, and Resolution phase (after orgasm). [5]

Although it is normal to have hypoactive sexual desire (loss of libido) in the first 6-7 weeks after giving birth, this becomes abnormal when the desire for sexual activity is persistently reduced or absent causing distress in the relationship. Sexual desire disorder after delivery may be due to the mother being preoccupied with the neonate or postpartum complications (e.g. infection, pain, and bleeding). It can often be associated with sexual pain disorder as well.

Dyspareunia is the most common type of PPFSD. Solana-Arellano et al (2008) reported an incidence of 41.3% for dyspareunia in the 60-180 days period after giving birth.[1] Postpartum dyspareunia may be due to medical (physical) problems such as a mal-healed perineal or vaginal tear, postpartum infection, cystitis, arthritis, or haemorrhoids, which may get worse after delivery. Moreover, dyspareunia might be caused by psychosocial factors like problems in relationship with the partner, work stress, financial crisis, depression, and anxiety. Dyspareunia, in many cases, can occur as a result of a combination of medical and psychosocial factors. Although, vaginismus is recognised as a different identity, it is usually associated with dyspareunia when it happens in the Puerperium. Vaginismus is the involuntary spasm of the pubococcygeal muscles causing difficult and painful penetration. Sexual desire disorders, Isolated postpartum sexual arousal and orgasmic disorder are rarely seen in postnatal clinics as when they occur they tend to be part of other PPFSDs.

Methods:

***Risk Factors for PPFSD*:**

To assess the risk factors for PPFSD a literature review was performed using the National Health Library database including all resources (AMED, BNI, CINAHL, EMBASE, HEALTH BUSINESS ELITE, HMIC, MEDLINE, and PsycINFO). The MESH word/s used was (postpartum sexual dysfunction OR postpartum dyspareunia OR dyspareunia after delivery OR sexual dysfunction after delivery OR sexual problems after delivery). Other different MESH words (using the word sexuality and/or puerperium) were used as well to expand the search possibilities. Only studies discussing the risk factors of PPFSD after vaginal birth were included. Perineal pain as a complication after episiotomy or tears was differentiated from dyspareunia, and studies on perineal pain after delivery were excluded from the review if they did not discuss the effect of the pain on sexual activity.

Effect of Mode of Delivery:

Searching the Cochrane library databases has shown no review related to the subject. However, Hicks et al (2004) have conducted a systematic review of literature focused on mode of delivery and the most commonly reported sexual health outcomes, which included dyspareunia, resumption of intercourse, and self-reported perception of sexual health/sexual problems.[6] In their systematic review they suggested an association between assisted vaginal delivery and some degree of sexual dysfunction but they reported that associations between Caesarean delivery and sexual dysfunction were inconsistent and continued research was necessary to identify modifiable risk factors for sexual problems related to method of delivery.[6] Hicks et al have searched PubMed, CINAHL, and Cochrane databases from January 1990 to September 2003, [6] so we have tried to continue the review by looking into the literature database after that date.

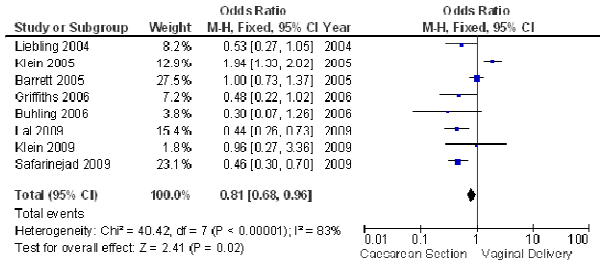
To assess the effect of mode of delivery on PPFSD (Caesarean section vs. vaginal birth), a literature review was performed using the National Health Library database including all resource (AMED, BNI, CINAHL, EMBASE, HEALTH BUSINESS ELITE, HMIC, MEDLINE, and PsycINFO) from October 2003 to January 2010. New MESH words were used, related to comparison between different modes of delivery (Caesarean section, vaginal birth, modes of delivery, sexual dysfunction, sexual disorder, dyspareunia). Additional studies from the reference lists were obtained. Only studies directly compared between caesarean section and vaginal birth in term of assessing the PPFSD were included.

Results:

***Risk Factors for PPFSD*:**

Nineteen studies and one systematic review were retrieved in the period from 01/01/1984 to 01/01/2010. The Cochrane library database review did not have related articles. It is worth mentioning, however, that there was a Cochrane review on postpartum perineal short term pain, not related to sexual activity. Therefore, it was excluded from this review. The systematic review included in this list of literature studies is the Langer and Minetti review on the complications of episiotomy.[7] Having systematically reviewed four hundred seventy two articles on the Medline database, they concluded that episiotomy, whether medial or mediolateral, appeared to be the cause of more dyspareunia in comparison to spontaneous perinea tears.[7] However, there was no significant difference in the incidence of dyspareunia beyond the three month period after delivery.[7] After the latter review, Solana-Arellano (2008) have showed that complications of episiotomy are an important risk factor for postpartum dyspareunia.[1] They have found that infection, dehiscence, and constricted introitus complicated an episiotomy can cause long-term postpartum dyspareunia.[1] Moreover, Ejegard et al have investigated the long term quality of women's sex life (12-18 months after first episiotomy-assisted delivery).[8] They have reported an adverse effect of episiotomy on women's sex life during the second year post partum .[8]

Effect of Mode of Delivery:



Graph 1: Forest plot of comparison between studies. Studies to left of the midline were in favour of less long term PPFSD symptoms with caesarean section compared to vaginal delivery.

Only eight studies fulfilled the criteria. Full papers were retrieved. There was one randomised controlled trial, one prospective cohort study, one cross-sectional study, and the other 5 were performed retrospectively (4 questionnaire surveys, and 1 interview survey). The total pool sample of patients studied included 3476 cases (1185 Caesarean sections vs. 2291 vaginal deliveries). Four studies aimed to compare PPFSD aspects within other variants, such as pelvic floor morbidity, urinary incontinence, and faecal or flatus incontinence.[9, 10, 11, 12] the other four studies purely compared PPFSD variants such as dyspareunia with no other pelvic floor morbidity variants.[13, 14, 15, 16] There has been an agreement between the studies on the less sexual problems after caesarean section compared to vaginal delivery in the short term after delivery (i.e. up to 3 months postpartum). However, in long term (i.e. more than 12 months postpartum), the outcome was controversial. A meta-analysis was conducted to compare and summarise the long term PPFSD results (Graph 1).

Discussion:

From the previous results, birth tract trauma is a risk factor which may lead to PPFSD. Therefore it is a logic presumption to think that avoiding pelvic floor injury by performing a caesarean section especially as an elective mode of delivery may alleviate PPFSD. This presumption, if true, will have very significant clinical and financial implications in practice especially with a pre-existing problem of increasing caesarean section rate in many parts of the developed world. So what research evidence in the literature is available to support or overrule this presumption?. The answer to this question becomes more challenging if we know that the British National Sentinel Caesarean Section Audit showed that 50 percent of consultant obstetricians agreed with the statement "elective caesarean section will least affect the mother's future sexual function" .[17]

From the previous meta-analysis, there is little evidence to support that a caesarean section may alleviate long term PPFSD compared to vaginal delivery (p=0,02). But, if we examine the studies' subgroups and primary/secondary results in more details, this evidence sounds insufficient.

Griffiths et al (2006) in their questionnaire survey of a 208 women from the Cardiff Birth Survey Database have showed a significant increase in the prevalence of dyspareunia two years after vaginal birth compared to caesarean section.[9]However, their comparison was between vaginal birth and elective caesarean section as they excluded emergency cases.[9] Moreover; they found similar increase in the prevalence of urinary incontinence, incontinence of flatus and subjective depression in the vaginal birth group, which lead us to think whether the dyspareunia was related to these factors and not related to vaginal birth itself. In their paper they did not mention if vaginal birth with no tears or complications was associated with a higher incidence of dyspareunia.

In contrast, Klein et al (2005) concluded that women who had intact perineum after vaginal birth had less dyspareunia than those underwent caesarean section.[12]However, the incidence of dyspareunia in the latter study was higher among women who had an episiotomy with or without forceps.[12] Similar findings were revealed by Buhling et al (2006) and Safarinejad et al (2009), who showed that persistence of dyspareunia longer than 6 months after delivery was the highest after operative vaginal delivery.[15, 16]Buhling et al concluded that the incidence of persistent dyspareunia was similar in the caesarean section and the spontaneous vaginal birth without injury

groups (approximately 3.5%), whereas, Safarinejad et al (2009) have shown that women after elective Caesarean section had the highest Female Sexual Function Index (FSFI) compared to other groups of delivery including the normal vaginal delivery without injury or episiotomy.[15, 16] Although Safarinejad et al (2009) study was robust in many aspects, such as using FSFI and studying the sexual function score for both the women and their partners, I think the main weakness in the study that they included only primiparous women.[16]Therefore, we cannot generalise their findings on women in their second or more pregnancies. Moreover, as a previous caesarean section will increase the operative risk of the successive caesarean sections or will add more risk to the trial of labour if this is opted for in the future, we can expect a higher increased of sexual disorders in the following pregnancies.

From previous discussion we found insufficient evidence to advocate a decision of performing a caesarean section on basis of alleviating PPFSD. This evidence is outweighed by the higher risk of caesarean section including bleeding, infection, anaesthesia risk, deep vein thrombosis, pulmonary embolism, impairment of future fertility, risk of scar dehiscence in next labour, injury to bladder and bowels and risk of fetal laceration.

Author's Conclusion:

***Risk Factors for PPFSD*:**

In this review, there is good evidence to suggest that episiotomy is an important risk factor for short term PPFSD. However, there is little evidence to support a possible long term effect especially if other complications to episiotomy occurred later. Breastfeeding, and the use of progestogen-only pill as contraceptive are other risk factors identified by other studies .[18, 19, 20] This may be caused by the low oestrogen level and the consequent dry vagina.[18, 19, 20] Other risk factors for PPFSD include the lack of postpartum sexual health counselling and treatment.[2, 21]

Effect of Mode of Delivery:

Postpartum female sexual disorder is a common problem which can be overlooked in practice sometimes. Awareness of the problem makes half of the solution. The other half consists of identifying the risk factors, careful antenatal and postnatal counselling and sexual health assessment, and educating women, their partners, and staff about diagnosis and management of the problem. Episiotomy and severe obstetric traumas are the main risk factors. Restricted use of episiotomy and early management of episiotomy complications can play an important role in preventing persistent PPFSD. There is insufficient evidence to suggest caesarean section as a better mode of delivery in term of preventing or alleviating PPFSD.

Competing Interests
None declared
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Review Article

BJMP 2010;3(2):320

"Influenza-2009" - An Escape from Disaster

Shailpreet Kaur Sidhu , Nidhi Singla and Jagdish Chander

Abstract:
In April 2009, World Health Organization declared the first ever public health emergency affecting overseas countries, territories and communities of the world with a new strain of the influenza A virus causing a global pandemic. This novel strain (H1N1) of the virus appears to be of swine origin and contains a unique combination of gene segments that have not been previously identified in swine or human influenza viruses. The symptoms of the 2009 H1N1 flu virus are clinically similar to those of seasonal influenza and have ranged from mild to severe. The neuraminidase inhibitors provide valuable defences against the virus, but their massive use has lead to the development of resistance to these antiviral agents. Vaccination is the only effective way to protect people from contracting illness during epidemics and pandemics of influenza.
Keywords:
Pandemic, Influenza, H1N1, Flu, Influenza A virus

Forty one years after the last influenza pandemic, while everyone was worrying about the avian influenza A (H5N1) virus causing a pandemic, an apparent new chapter is opened with the emergence of new strain of influenza A virus. On 24th April, the World Health Organization (WHO) declared the first ever public health emergency of international concern indicating the occurrence of confirmed human cases of swine influenza in Mexico and United States.[1]Subsequently the Centre for Disease Control and Prevention (CDC) confirmed that these human influenza cases were caused by a novel strain of influenza A virus to which there is little or no population immunity.[2] On June 2009, the WHO rated the pandemic alert from phase 5 to 6, signalling that the first pandemic of the 21st century was underway. It was however stressed that the rise in the pandemic alert level was mainly attributed to the global spread of the virus rather than its severity. The pandemic potential of influenza A viruses has been ascribed to their genetic and antigenic instability and there ability to transform by constant genetic re-assortment or mutations, which can result in the emergence of novel progeny subtypes capable of both infecting and leading to sustained person to person transmission.[3] The newly emerged strain contains a combination of gene segments that have not been previously identified in swine or human influenza viruses.[4]

Historical Perspectives

Influenza has been recognised for hundreds of years, but the cause was unknown for most of this time. Hippocrates had defined this disease about 2400 years ago, but lacked laboratory confirmation.[5] The year 1580, marks the first instance of influenza recorded as an epidemic even though there is possibility that there were many prior influenza epidemics.[6] The word influenza (meaning influence), first used in 1743 originated from the Latin word "Influenza", named so because the disease was considered to be caused by unfavourable astrological conditions. Since 1700, there have been approximately a dozen influenza A virus pandemics and the lethal outbreak of 1918-1919 is dubbed as the greatest medical holocaust in recorded history, killing up to 50 million people worldwide.[7]

The earliest evidence of influenza A virus causing acute respiratory illness in pigs was traced to the 1930s. Swine influenza A viruses are antigenically very similar to the 1918 human influenza A virus and they may all have originated from common ancestor.[8] From 1930 to 1990, classic swine influenza A was the commonest swine influenza virus circulating amongst the swine population during which the virus did not undergo much genetic change. Antigenic variants of these classical influenza viruses emerged in 1991 and the real antigenic shift occurred at the ends of last century when the classical swine influenza virus re-assorted with human influenza A virus and a North American lineage avian influenza virus. This resulted in the emergence of multiple subtypes including H1N2 and H3N2. In the past few years, sporadic cases of human infections caused by swine influenza A virus have occurred, mainly due to subtypes. Occupational exposure to swine was the most important risk factor for infection and fortunately all patients recovered without resulting in efficient, sustained human to human transmission.[9]

Origin of 2009 Strain

The pandemic that began in March 2009, was originally referred to as "swine flu" because laboratory testing showed that many of the genes in this new virus were very similar to influenza viruses that normally occur in pigs (swine) in North America. But further study has shown that this new strain of virus represents a quadruple re-assortment of two swine strains,

one human strain and one avian strain of influenza. The largest proportion of genes come from swine influenza viruses (30.6% from North American swine influenza strains, and 17.5% from Eurasian swine influenza strains), followed by North American avian influenza strains (34.4%) and human influenza strains (17.5%).[10] Analysis of the antigenic and genetic characteristics of the pandemic influenza A virus demonstrated that it's gene segments have been circulating for many years, suggesting that lack of surveillance in swine is the reason that this strain had not been recognized previously.[11] This novel strain is antigenically distinct from seasonal influenza A and possesses previously unrecognised molecular determinants that could be responsible for the rapid human to human transmission. Moreover, antigenic drift has occurred amongst different lineages of viruses, therefore, cross protection antibodies against avian, swine and human viruses are not expected to exist. Emerging scientific data support the hypothesis of a natural genesis, with domestic pigs a central role in the generation and maintenance of the virus. Protein homology analysis of more than 400 protein sequences from the new influenza virus as well as other homologous proteins from influenza viruses of the past few seasons also confirmed that this virus has a swine lineage.[1] Phylogenetic analysis has suggested that initial transmission to humans occurred several months before the recognition of the outbreak and multiple genetic ancestry of this influenza A is not indicative of artificial origin.[11]

Situation Update

In March 2009, an outbreak of respiratory illness was first noted in Mexico, which was eventually identified as being related to influenza A.[12] The outbreak spread rapidly to the United States, Canada and throughout the world as a result of airline travel.[13] On 11th June 2009, the WHO raised its pandemic alert to the highest level i.e. phase 6, indicating widespread community transmission on at least two continents.[14]

Pandemic influenza was the predominant influenza virus circulating in the US, Europe, northern and eastern Africa and in Australia. Activity of the virus has initially peaked and then declined in North America and in parts of western, northern and Eastern Europe, but activity continued to increase in parts of central and southeastern Europe, as well as in central and south Asia. As of 28th February 2010, worldwide more than 213 countries and overseas territories or communities have reported laboratory confirmed cases of pandemic influenza 2009, including at least 16455 deaths; a number the WHO acknowledges significantly underreported the actual number.[15] Most of the deaths have been related to respiratory failure resulting from severe pneumonia and acute respiratory distress syndrome.[16]

In India, the number of confirmed cases till March 2010 was 29,953 and a total of 1410 deaths were reported. The rate of infection has been highest among children and young individuals of <24 years of age. To date, pandemic influenza A infections are uncommon in persons older than 65 years, possibly as a result of pre-existing immunity against antigenically similar influenza viruses that circulated prior to 1957.[17] High rates of morbidity and mortality has been noted among children and young adults with underlying health problems including chronic lung disease, immunosuppressive conditions, cardiac disease, pregnancy, diabetes mellitus and obesity.[18]

Transmission and Shedding

Novel virus is contagious and can transmit from human to human in ways similar to other influenza viruses. The main route of transmission between humans is via inhalation of infected respiratory droplets (range in size from 0.08 µm to 0.12 µm) produced after coughing and sneezing.[19] Transmission via contact with surfaces that have been contaminated with respiratory droplets or by aerosolised small-particle droplets may also occur. In addition to respiratory secretions, all other body fluids (including diarrhoeal stool) should also be considered potentially infectious.

The estimated incubation period is unknown and could range from 1 to 7 days, although the median incubation period in most cases appears to be approximately 2 days.[20] Shedding of the virus begins the day prior to the onset of symptoms and can persist for 5-7 days in immunocompetent individuals. The amount of virus shed is greatest during the first 2-3 days of illness. Persons who continue to be ill, for a period of longer than 7 days after illness onset, should be considered potentially contagious until symptoms have resolved. Longer periods of shedding may occur in children (especially young infants), elderly adults, and patients with chronic illnesses and immunocompromised hosts who might be contagious for longer periods.

Clinical Manifestations

According to the CDC, in humans the symptoms of the 2009 "flu" virus are similar to those of influenza and of influenza-like illness in general. The illness with the virus has ranged from mild to severe and symptoms include fever, cough, sore throat, body aches, headache, chills and fatigue, which are usual features of influenza virus. The 2009 outbreak has shown an increase percentage of patients reporting diarrhoea and vomiting.[16] As these symptoms are not specific to swine flu hence a differential diagnosis of probable swine flu requires not only symptoms but also a high likelihood of swine flu due to person's recent history. The CDC advised physicians to consider swine influenza infection in the differential diagnosis of patients with acute febrile respiratory illness who have either been in contact with persons with confirmed swine flu or who were in states that have reported swine flu cases during the 7 days preceding their illness onset.

The overall severity with this 2009 virus has been less than what was observed during the influenza pandemic of 1918-1919. Most patients appear to have uncomplicated, typical influenza-like illness and recovered without requiring any medical treatment. About 70% of people who have been hospitalised have had one or more medical conditions, which include pregnancy, diabetes, heart disease, asthma and kidney disease.[21] The most common cause of death is acuterespiratory distress syndrome. The other causes of death are severe pneumonia with multifocal infiltrates (leading tosepsis), high fever (leading to neurological problems), dehydration (from excessive vomiting and diarrhoea) andelectrolyte imbalance. Fatalities are more likely in young children (<5 years), elderly (>65 years) and in people with underlying conditions, which include pregnancy, asthma, lung diseases, diabetes, morbid obesity, autoimmune disorders, immunosuppressive therapies, neurological disorders and cardiovascular disease.[22]

Laboratory Diagnosis

All diagnostic laboratory work on clinical samples from suspected cases of virus infection should be done in a Biosafety Level 2 (BSL-2) Laboratory. Suspected cases of novel infection should have respiratory specimens (nasopharyngeal, nasal or oropharyngeal swab, bronchoalveolar lavage and endotracheal aspirate) collected to test for the 2009 flu virus. Specimens should be placed into sterile viral transport media (VTM) and to be kept at 4°C. Real time reverse transcriptase polymerase chain reaction (RT-PCR) is the recommended sensitive method for the detection of virus, as well as to differentiate between pandemic 2009 and regular seasonal flu.[23] The other rapid influenza diagnostic tests (RIDTs), although provide results within 30 minutes or even less, none of these tests can distinguish between influenza A virus subtypes. Moreover, RIDTs do not provide any information about antiviral drug susceptibility. Isolation of the virus in cell cultures or embryonated eggs is another method for diagnosis of infection, but may not yield timely results for clinical management and negative viral culture does not exclude the influenza A infection.

However, most people with flu symptoms do not need a test for pandemic 2009 flu, specifically because the test results usually do not affect the recommended course of treatment. The CDC recommends testing only for people who are hospitalised with suspected flu and persons having underlying medical conditions and those with weak immune systems.[24] It is also expressed that treatment should not be delayed by waiting for laboratory confirmation of test results, but rather make diagnosis based on clinical and epidemiological backgrounds and start treatment early.

Treatment

The virus isolates in the 2009 outbreak are found to be resistant to amantidine and rimantidine. The CDC recommends the use of neuraminidase inhibitors as the drugs of choice for treatment and prevention of 2009 influenza in both children and adults.[25] Tamiflu (oseltamivir phosphate) and Relenza (zanamivir) are the two FDA-approved influenza antiviral drugs and a third neuraminidase inhibitor peramivir is an experimental drug approved for hospitalised patients in cases where the other available methods of treatment are ineffective or unavailable. Antiviral drugs not only make the illness milder but also prevent serious flu complications. However, the majority of people infected with the virus make a full recovery without requiring medical attention or antiviral drugs. Treatment is recommended for patients with confirmed or suspected 2009 influenza who have severe, complicated or progressive illness or who are hospitalised. People who are not from the at-risk group and have persistent or rapidly worsening symptoms should also be treated with antivirals. Therapy should be started as soon as possible, since evidence of benefit is strongest when treatment is started within 48 hours of illness onset.[26] Treatment should not be delayed while awaiting the results of diagnostic testing nor should it be withheld in patients with indications for therapy who present >48 hours after the onset of symptoms. Beside antivirals, supportive care at home or in hospital, focuses on controlling fevers, relieving pain and maintaining fluid balance as well as identifying and treating any secondary infections or other medical problems.

Major Concern

The neuraminidase inhibitors oseltamivir and zanamivir provide valuable defences and have been used widely for treatment and chemoprophylaxis of 2009 pandemic influenza A.But the recent emergence of resistance to these antiviral drugs is a matter of immediate concern. Influenza A strain resistant to oseltamivir has been reported from a variety of geographical locales and poses a challenge for the management of severely compromised patients.[27] The CDC warned that the indiscriminate use of antiviral medications to prevent and treat influenza could ease the way for drug resistant strains to emerge, which would make the fight against the pandemic much harder. Most of the patients recover spontaneously without any medical attention and use of antiviral medications should be reserved primarily for people hospitalised with pandemic flu and persons, with pre-existing or underlying medical conditions who are at higher risk for influenza-related complications. It has also been emphasised that early treatment once a patient has developed symptoms, rather than chemoprophylaxis, should reduce opportunities for the development of oseltamivir resistance.[26]The degree to which these drugs will remain effective for the treatment of the novel strain of influenza in the coming months is still a question.

What's next?

The only possible way to combat the situation is large scale immunization. Antiviral drugs are not a substitute for vaccinination and are used only as an adjunct to vaccines in the

control of influenza. Vaccines are one of the most effective ways to protect people from contracting illness during epidemics and pandemics of influenza. The seasonal vaccines do not confer any protection against 2009 H1N1; new vaccines have been licensed and are available.[28] The vaccines are available in both live-attenuated and inactivated formulations. Two types of vaccines are approved by the FDA for use in the prevention of 2009 pandemic influenza virus. These are TIV ("flu shot" of trivalent inactivated vaccine) and LAIV (nasal spray of live attenuated vaccine). The inactivated vaccine is contraindicated in patients with severe allergic reaction to eggs or any other component of the vaccine. The live attenuated vaccine is licensed for persons aged 2 through 49 years who are not pregnant, are not immunocompromised and have no underlying medical conditions. Children less than 5 years who have asthma and are taking long term aspirin therapy should also not receive live vaccines. Otherwise, both vaccines are safe and highly immunogenic and a single administration leads to robust immune response in 80% to 90% of adults aged 18-64 years and in 56% to 80% of adults aged 65 years and older with in about 10 days.[29] Children younger than 10 years will require two administrations of the vaccine separated by at least 21 days. Adverse effects following vaccination are minor, just like those of seasonal influenza vaccine and are self limiting. Concerns regarding the risk of Guillain-Barre syndrome (GBS) after vaccination have been raised. Various studies have suggested that the risk of GBS is higher from influenza itself rather than from the vaccine and the other adverse effects.[30] The CDC is now encouraging everyone including people of 65 years and above to get vaccinated against the 2009 strain of influenza.

The Government of India has recently approved a split virus, inactivated, non-adjuvant monovalent vaccine (Panenza by Sanofi Pasteur) to inoculate frontline health workers and those who have a high risk of getting infected.[31] Groups of health care workers has also been singled out by the European council for attention and immunization.[32] Infection control practices in the health care settings should be followed along with as per the guidelines.[33] Patients should also be educated regarding the other preventive measures, including using tissues to cover their mouth and nose when coughing and sneezing, developing good hand washing techniques, use of alcohol based hand-rubs, avoiding contact with ill persons if possible and staying home when ill unless medical attention has been given.

The flu season seems to be dying down in 2010 but the war is yet not over. Lessons must be learnt from the previous influenza pandemics and it is still important to get vaccinated against the flu and be prepared, as activity as well as virulence might increase again in the coming season. The words of Margaret Chan (Director General, WHO) to be remembered that *"the virus writes the rule and this one like all influenza viruses can change the rules, without rhyme or reason, at any time"*.

Competing Interests
None declared
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Review Article

BJMP 2010;3(2):324

Acute Lung Injury And Acute Respiratory Distress Syndrome: A Review Article

Helen Laycock and Abid Rajah

Abstract

Acute lung injury is a syndrome with a diagnostic criteria base on hypoxaemia and a classical radiological appearance, with acute respiratory distress syndrome at the severe end of the disease spectrum. Its incidence is common, it is likely to exist outside the intensive care setting and therefore is a condition relevant to all clinicians. Genetically predisposed individuals are subject to environmental triggers which can be intra or extrapulmonary in nature. An inflammatory response causes damage to alveolar epithelial cells and vasculature, impairing gas exchange and can lead to multiple organ failure. Management centres around supportive care and treating the cause, but evidence supports use of low tidal volume ventilatory settings and conservative intravenous fluid strategies. Long term outcomes are related to neuromuscular, cognitive and psychological issues rather than pulmonary, and rehabilitation during recovery needs to focus on this.

Acute Lung Injury (ALI) is a continuum of clinical and radiographic changes affecting the lungs, characterised by acute onset severe hypoxaemia, not related to left atrial hypertension, occurring at any age. At the severe end of this spectrum lies Acute Respiratory Distress Syndrome (ARDS) and therefore unless specifically mentioned this review will address ARDS within the syndrome of ALI.

It was first described by Ashbaugh in the Lancet in 1967. This landmark paper described a group of 12 patients with "Respiratory Distress Syndrome" who had refractory hypoxaemia, decreased lung compliance, diffuse infiltrates on chest radiography and required positive end expiratory pressure (PEEP) for ventilation.[1]

Key Points on Acute Lung Injury

- Common, life threatening condition which is a continuum of respiratory dysfunction with ALI and ARDS being at either end of the spectrum
- Risk factors include conditions causing direct and indirect lung injury, leading to an inflammatory response which can cause multiple organ failure
- Damage to alveolar epithelial cells and capillary vasculature impair gas exchange and can lead to fibrosis
- Management aims include supportive care, maintaining oxygenation and diagnosing and treating the underlying cause
- Evidence supports low tidal volume ventilation and conservative fluid management
- Long term outcomes relate to neuromuscular, neurocognitive and psychological problems rather than pulmonary dysfunction

This initial description gave only vague criteria for diagnosis, focused on the most severe end of the continuum and was not specific enough to exclude other conditions. A more precise definition was described by Murray et al. in 1988 using a 4 point lung injury scoring system including the level of PEEP used in ventilation, ratio of arterial oxygen tension to fraction of inspired oxygen (PaO_2/FiO_2), static lung compliance and chest radiography changes[2]. Despite being more specific and assessing severity it was too large and complex for practical purposes in the ICU setting.

It was not until 1994 that The American –European Consensus Conference on ARDS set the criteria used today to define both ALI and ARDS in research and clinical medicine. It recommended ALI be defined as "a syndrome of inflammation and increased permeability that is associated with a constellation of clinical, radiological and physiological abnormalities that cannot be explained by, but may coexist with, left atrial or pulmonary capillary hypertension" .[3] They distinguished between ALI and ARDS based upon the degree of hypoxaemia present, as determined by the ratio of partial pressure of arterial oxygen to fractional inspired oxygen concentration (PaO_2/FiO_2), with ALI patients demonstrating a milder level of hypoxaemia. Additionally ARDS changed from Adult Respiratory Distress Syndrome to Acute Respiratory Distress Syndrome to account for its occurrence at all ages.

DIAGNOSIS AND PROBLEMS RELATED TO THIS

There are no gold standard radiological, laboratory or pathological tests to diagnosis ALI and ARDS and patients are given the diagnosis based on meeting the criteria agreed in 1994. (See Table 1)

ALI is diagnosed clinically and radiologically by the presence of non-cardiogenic pulmonary oedema and respiratory failure in the critically ill.

Meeting criteria, in itself, is not a problem when diagnosing conditions in the ICU setting, as sepsis and multi-organ failure are defined using consensus based syndrome definitions,

however there are problems specifically related to ALI's diagnosis.

Table 1 – Diagnostic Criteria for ALI and ARDS

	ALI	ARDS
Onset	Acute	Acute
Oxygenation (PaO_2/FiO_2) ratio in mmHg, regardless of ventilatory settings	<300	<200
Chest Radiological Appearance	Bilateral Pulmonary Infiltrations which may or may not be symmetrical	Bilateral Pulmonary Infiltrations which may or may not be symmetrical
Pulmonary Wedge Pressure (in mmHg)	<18 or no clinical evidence of left atrial hypertension	<18 or no clinical evidence of left atrial hypertension

In practice ALI and ARDS are clinically under-diagnosed, with reported rates ranging between 20 to 48% of actual cases.[4] This is due to poor reliability of the criteria related to;

- Non-specific radiological findings which are subject to inter-observer variability
- Oxygenation criteria is independent of inspired oxygen concentration or ventilator settings including lung volumes and PEEP
- Excluding cardiac causes of pulmonary oedema including left ventricular failure, mitral regurgitation and cardiogenic shock, in the ICU setting is difficult even when pulmonary artery catheters are used
- The definition includes a heterogeneous population who behave very differently in response to treatment, duration of mechanical ventilation and severity of pulmonary dysfunction.

However this is the definition used by the ARDS network (a clinical network set up in 1994 by The National Heart, Lung and Blood Institute and the National Institutes of Health in the USA) for its clinical trials and on this basis it is validated.

EPIDEMIOLOGY

Incidence

Incidence of ALI is reported as 17-34 per 100,000 person years.[5] Unfortunately despite population studies demonstrating fairly consistent trends regarding age (mean approximately 60years), mortality (35-40%) and ratio of ARDS to ALI (around 70%), incidence figures are less consistent internationally. A recent prospective population-based cohort study in a single US county demonstrated a higher incidence around 78.9 per 100,000 person years and inferred from this that 190,600 cases could occur in the USA alone each year.[6] This variation is likely due to problems with reliability of diagnosis as illustrated above and also related to ALI generally presenting as a critical care illness making its epidemiology directly linked to availability of ICU resources.

Cases are only "captured" in the ICU setting and it potentially exists outside this environment in unknown quantities.[7] Taking this into account means ALI and ARDS are probably far commoner in clinical practice than reported and many patients may meet the diagnosis yet be managed outside the ICU environment.[8]

Risk Factors

ALI is a multi-factorial process which occurs due to environmental triggers occurring in genetically predisposed individuals, as ALI-inducing events are common, yet only a fraction of those exposed develop the syndrome.

Environmental triggers for developing ALI can be divided into those causing direct and those causing indirect lung injury, with sepsis, either intrapulmonary or extrapulmonary being the commonest cause. (See table 2)

Table 2 Direct and Indirect triggers for ALI

Direct Lung Injury	Indirect Lung Injury
Common	**Common**
• Pneumonia	• Sepsis
• Aspiration of gastric contents	• Severe trauma with shock and multiple transfusions
Less Common	**Less Common**
• Pulmonary contusion	• Burns
• Fat / Amniotic fluid embolism	• Disseminated intravascular coagulation
• High Altitude	• Cardiopulmonary bypass
• Near Drowning	• Drug overdose (heroin, barbiturates)
• Inhalation Injury	• Acute pancreatitis
• Reperfusion Injury	• Transfusion of blood products
	• Hypoproteinaemia

At present there is research into the role of genetic factors and how they contribute to susceptibility and prognosis.[9] It is difficult to assess the molecular basis of ALI due to the range of ALI inducing events which can cause the lung injury, the heterogeneous nature of the syndrome itself, presence of additional comorbidities, potentially incomplete gene penetrance and complex gene-environment interactions. However possible candidate genes which predispose patients to ALI have been identified and other genes exist which may influence its severity, thus providing targets for research in treatment development.

Secondary factors including chronic alcohol abuse, chronic lung disease and low serum pH may increase risk of developing ALI.[7] There may be factors which are protective against its development, such as diabetes in septic shock patients,[10] but further research is required.

PATHOPHYSIOLOGY

It is thought ALI patients follow a similar pathophysiological process independent of the aetiology. This occurs in two phases; acute and resolution, with a possible third fibrotic phase occurring in a proportion of patients.

Acute Phase

This is characterised by alveolar flooding with protein rich fluid secondary to a loss of integrity of the normal alveolar capillary base, with a heterogeneous pattern of alveolar involvement.

There are two types of alveolar epithelial cells (Table 3), both of which are damaged in ALI, likely via neutrophil mediation, with macrophages secreting pro-inflammatory cytokines, oxidants, proteases, leucotrienes and platelet activating factor.

Table 3 Characteristics of Type I and Type II Alveolar Epithelial Cells

	Type I	Type II
Percentage of cells	90%	10%
Shape	Flat	Cuboidal
Function	Provide lining for alveoli	Replace damaged type I cells by differentiation Produce surfactant Transport ions and fluids

Damage to type I alveolar epithelial cells causes disruption to alveolar-capillary barrier integrity and allows lung interstitial fluid, proteins, neutrophils, red blood cells and fibroblasts to leak into the alveoli.

Damage to type II cells decreases surfactant production and that produced is of low quality, likely to be inactivated by fluid now in alveoli, which leads to atelectasis. Additionally there is impaired replacement of type I alveolar epithelial cells and an inability to transport ions and therefore remove fluid from the alveoli.

Coagulation abnormalities occur including abnormal fibrinolysis and formation of platelet and fibrin rich thrombi which result in microvascular occlusion, causing intrapulmonary shunting leading to hypoxaemia.

Ventilation-perfusion mismatch, secondary to alveolar collapse and flooding, decreases the number of individual alveoli ventilated, which in turn increases alveolar dead space, leading to hypercapnia and respiratory acidosis. Additionally pulmonary compliance decreases and patients start to hyperventilate in an attempt to compensate the above changes.

The release of inflammatory mediators from damaged lung tissue triggers systemic inflammation and systemic inflammatory response syndrome (SIRS) which may progress to multiple organ failure, a leading cause of death in ARDS patients.

Resolution Phase

This phase is dependent on repair of alveolar epithelium and clearance of pulmonary oedema and removal of proteins from alveolar space.

The type II alveolar epithelial cells proliferate across the alveolar basement membrane and then differentiate into type I cells. Fluid is removed by initial movement of sodium ions out of the alveoli via active transport in type II alveolar epithelial cells, with water then following, down a concentration gradient through channels in the type I alveolar epithelial cells.

Soluble proteins are removed by diffusion and non soluble proteins by endocytosis and transcytosis of type I alveolar epithelial cells and phagocytosis by macrophages.

Fibrotic Phase

Some patients do not undergo the resolution phase but progress to fibrosing alveolitis, with fibrosis being present at autopsy in 55% non-survivors of ARDS.[11] This occurs by the alveolar spaces filling with inflammatory cells, blood vessels and abnormal and excessive deposition of extracellular matrix proteins especially collagen fibres.[12] Interstitial and alveolar fibrosis develops, with an associated decrease in pulmonary compliance and only partial resolution of pulmonary oedema with continued hypoxaemia.

CLINICAL FEATURES

Acute Phase

The diagnosis should be considered in all patients with risk factors who present with respiratory failure, as the onset though usually over 12 to 72 hours, can be as rapid as 6 hours in presence of sepsis.

Patients present with acute respiratory failure where hypoxaemia is resistant to oxygen therapy and chest auscultation reveals diffuse, fine crepitations, indistinguishable from pulmonary oedema.

Resolution Phase

This phase usually occurs after around 7 days after onset of ALI, where a resolution of hypoxaemia and improvement in lung compliance is seen.

Fibrotic Phase

There is persistent impairment of gas exchange and decreased compliance. In severe cases it can progress to pulmonary hypertension through damage to pulmonary capillaries and even severe right heart failure, with the signs and symptoms of this developing over time.

INVESTIGATIONS

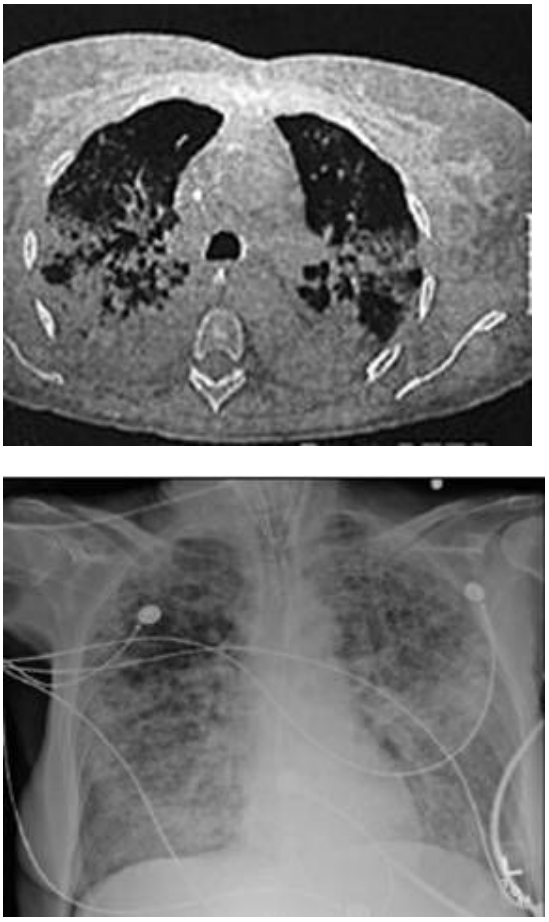
Diagnostic criteria require arterial blood gas analysis to demonstrate the required ratio between the partial pressure of arterial oxygen and fractional inspired oxygen concentration.

Radiological Findings

Although there are no pathognomonic radiographic findings for ALI, features on plain chest radiography include;

- Bilateral patchy consolidation, which may or may not be symmetrical
- Normal vascular pedical width
- Air bronchograms
- Pleural effusion may be present
- 10-15% patients have pneumothoraces independent of ventilator settings

Computer tomography of the chest can show the heterogeneous nature of ALI, with dependent areas of the lung showing patchy consolidation with air bronchograms, atelectasis and fibrosis. As with plain radiography there may be pneumothoraces present.



Computer tomography and Chest radiograph of ARDS

MANAGEMENT

The aims of management are to provide good supportive care, maintain oxygenation and to diagnose and treat the underlying cause.

General

Good supportive care, as for all ICU patients, should include nutritional support with an aim for early enteral feeding, good glycaemic control and deep venous thrombosis and stress ulceration prophylaxis. It is important to identify and treat any underlying infections with antibiotics targeted at culture sensitivities and if unavailable, towards common organisms specific to infection site.

It is not uncommon for ALI patients to die from uncontrolled infection rather than primary respiratory failure.

Ventilator associated pneumonia is common in patients with ALI and can be difficult to diagnoses, as ALI radiological findings can mask new consolidation and raised white cell count and pyrexia may already be present. If suspected this should be treated with appropriate antibiotics, although long term ventilation can cause colonisation which leads to endotracheal aspirate culture results being difficult to interpret.

Although the role of physiotherapy in ALI is unclear, aims of treatment should be similar to those in all ICU patients, including removal of retained secretions and encouragement of active and passive movements, as patients are often bed bound for prolonged periods of time.

Ventilation

MODE OF VENTILATION

Ventilation is usually via endotracheal intubation using intermittent positive pressure ventilation with PEEP. There may be a role for non invasive ventilation in early stages of ALI, but it is poorly tolerated at higher PEEP settings which may be required to maintain oxygenation, and no evidence supports its use at present. Additionally there is no evidence to suggest an advantage of either volume or pressure controlled ventilation.

Principles of ventilation in ALI are to maintain adequate gas exchange until cell damage resolves whilst avoiding ventilator associated injury from;

- Barotrauma – alveolar overdistension associated with ventilation at high volumes
- Volutrauma – alveolar overdistension associated with ventilator high pressures
- Biotrauma – repeated opening and closing of collapsed alveoli causing shearing stress which can initiate a proinflammatory process

Lungs in patients with ALI are heterogeneous and therefore can react variably to changes in ventilator settings. Therefore

settings which provide adequate oxygenation, may damage more "healthy" areas of lung.[13]

Table 4 Lung ventilation in different parts of lung with acute lung injury

Area	Characteristics	Behaviour when ventilated
1	Normal compliance and gas exchange	Easily over ventilated Exposed to potential damage
2	Alveolar flooding and atelectasis	Alveoli can still be recruited for gas exchange by safely raising airway pressures
3	Severe alveolar flooding and inflammation	Alveoli cannot be recruited without using unsafe airway pressures

TIDAL VOLUMES

Old strategies of high volume ventilation are likely to over inflate healthy lung portions leading to barotrauma and ventilator management in ALI has moved towards lower tidal volumes. This is a consequence of the ARDSnet tidal volume study, which demonstrated significant reduction in mortality (40 to 31%) when using a low volume ventilator strategy based on predicted body weight (6mls/kg and peak pressures <30cmH_2O vs. 12mls/kg and peak pressures <50cmH_2O).[14] Furthermore they showed a decrease in systemic inflammatory markers, lower incidence of multiple organ failure and an increase in ventilator free days in the lower tidal volume group.

PEEP

It was postulated that PEEP may be beneficial in ARDS as it reduces biotrauma, maintains the patency of injured alveoli, reduces intrapulmonary shunting and improves ventilation-perfusion mismatch. However evidence regarding its use is inconclusive. Numerous large centre trials have demonstrated no difference in outcome or mortality between patients ventilated with lower PEEP vs. higher PEEP (8 vs. 14 cm H_2O).[15] [16] [17] Yet a recent JAMA systematic review and meta-analysis showed that although higher PEEP ventilation was not associated with improved hospital survival, it was associated with improved survival among the ARDS subgroup of ALI and suggested that an optimal level of PEEP remains unestablished but may be beneficial.[18]

ECMO (Extracorporeal membrane oxygenation)

This is a modified longer term form of cardiopulmonary bypass which aims to provide gas exchange across an artificial membrane external to the body, allowing the lungs time to recover. It is confined to a few specialist centres in the UK and the first results from the CESAR multicentre randomised controlled trial were published in the Lancet in 2009. It

showed improved survival in adult patients with severe but potentially reversible respiratory failure on ECMO, as compared to conventional ventilation and demonstrated cost effectiveness in settings like the UK healthcare system.[19] This therefore may be a treatment strategy to consider in extreme cases resistant to conventional therapy.

OTHER STRATEGIES

A current meta-analysis looking at prone positioning concluded that randomised controlled trials failed to demonstrate improved outcomes in ARDS patients overall. There is a decrease in absolute mortality in severely hypoxaemic patients with ARDS but as long term proning can expose ALI patients to unnecessary complications, it should only be used as rescue therapy for individuals resistant to conventional treatment.[20]

No evidence supporting specific weaning programmes exists and a recent Cochrane review showed no evidence to support recruitment manoeuvres in ALI. [21]

Therefore the aim of ventilation is low volumes with permissive hypercapnia, providing adequate oxygenation (regarded as a partial pressure of arterial oxygen >8kPa) whilst trying to avoid oxygen toxicity lung injury.

Fluid Management

Fluid management has to balance the need for enough fluid to maintain an adequate cardiac output and end organ perfusion, with a low enough intravascular pressure to prevent high capillary hydrostatic pressures, which could cause pulmonary oedema, worsen oxygen uptake and carbon dioxide excretion. Evidence supports a negative fluid balance in patients not requiring fluid for shock.

Studies as early as 1990 showed a reduction in pulmonary wedge pressure was associated with increased survival[22] and extravascular lung water was associated with poor outcomes[23] in ARDS patients.

The ARDSnet FACTT study looked at two fluid regimens comparing liberal fluid management (a net gain of approximately 1 litre per day) with a conservative fluid management (zero net gain over first seven days).[24] Although there was no significant difference in (the) primary outcome of 60 day mortality, the conservative management group had improved lung function, shortened duration of mechanical ventilation and intensive care and had no increased incidence of shock or use of renal replacement. This is supported by a recent retrospective review, which concluded negative cumulative fluid balance at day 4 of acute lung injury is associated with significantly lower mortality, independent of other measures of severity of illness.[25]

Pharmacotherapy

To date no pharmacological agent has been demonstrated to reduce mortality among patients with ALI.[26] However ALI encompasses a wide range of patients with varying aetiology and

comorbidities. It may be that on subdividing ALI patients, some therapies may be suitable for specific circumstances but at present there is little literature to support this.

EXOGENOUS SURFACTANT

Since the 1980's numerous randomised controlled trials have demonstrated no benefit from synthetic, natural or recombinant surfactant use in adults with ALI.

INHALED NITRIC OXIDE

Despite providing selective vasodilatation and improving ventilation perfusion mismatch, trials have only showed short lived improvement in oxygenation and no change in mortality with nitric oxide use. At present it plays no role in standard ALI treatment and should be reserved for rescue therapy in patients difficult to oxygenate.[27]

STEROIDS

Despite the potential for steroids to benefit ALI patients due to anti-inflammatory properties, clinical trials demonstrate no improved mortality when given early or late in disease progression and given concerns regarding their role in development of neuromuscular disorders associated with critical illness, a recent large randomised controlled trial argued against steroid use in ALI.[28]

INTRAVENOUS SALBUTAMOL

Beta 2 agonists were shown to be experimentally beneficial in ALI due to increasing fluid clearance from alveolar space, anti-inflammatory properties and bronchodilation.[29] The BALTI trial published in 2006, investigated the effects of intravenous salbutamol in patients with ARDS. It showed decreased lung water at day 7, lowered Murray lung injury scores and lower end expiratory plateau pressures but an increase in incidence of supraventricular tachycardias and therefore further investigation is needed before it can be recommended as treatment for ALI.[30] The BALTI-2 trial is currently underway in the UK, to further assess possible benefits and complications.

Other new and promising treatments which are currently being evaluated in trials are activated protein C and granulocyte-macrophage colony-stimulating factor (GM-CSF).

MORTALITY

Mortality rates of patients with ALI and ARDS are similar, with both being around 35-40%.[3] Controversy exists regarding whether mortality rates in ALI are decreasing,[31] or have stayed static.[32] Nonetheless death in patients with ALI is rarely from unsupportable hypoxaemic respiratory failure but from complications of the underlying predisposing conditions or multiple organ failure.[33]

There is some evidence related to racial and gender differences in mortality (worse in African Americans and males)[34] and that thin patients have increased mortality and obese patients have somewhat lower mortality than normal weight individuals[35] but the main independent risk factors for increased mortality are shown in Table 5.

Table 5 Independent risk factors for increased mortality in ALI as identified in multicentre epidemiological cohorts

- Old age
- Worse physiological severity of illness
- Shock, on admission to hospital
- Shorter stay in the ICU after ALI onset
- Longer hospital stay before ALI onset
- Increased opacity on chest radiography
- Immunosupression

OUTCOMES

Long term problems are related to neuromuscular, neurocognitive and psychological dysfunction rather than pulmonary dysfunction. (Table 6) There is poor understanding of the mechanisms which cause these sequelae and therefore prevention of these outcomes and planning rehabilitation can be difficult.

Table 6 Long Term Outcomes in ARDS survivors and caregivers

Neuromuscular dysfunction
- critical illness polyneuropathy
- critical illness myopathy
- entrapment neuropathy

Neurocognitive dysfunction involving
- memory
- executive function
- attention
- concentration

Psychological dysfunction
- Post traumatic stress disorder
- Depression
- Anxiety

Other
- Pulmonary dysfunction
- Tracheostomy site complications
- Striae
- Frozen joints

Caregiver and financial burden

A recent study into patients who survived ALI showed they require support during discharge from ICU to other hospital settings and again once in the community regarding guidance on home care, secondary prevention and support groups.[36]

CONCLUSION

The syndrome which encompasses ALI and ARDS is common and under-recognised, with many clinicians encountering it outside the ICU setting. Despite advances in identification and management, morbidity and mortality is still high. Care should

focus on supportive treatment and managing the underlying cause, whilst specifically aiming for low volume ventilation and conservative fluid balance. Ongoing research is still needed to hone the diagnostic criteria, define genetic risk factors and develop new treatment strategies to improve outcome. The new challenge for clinicians is how to address the long term outcomes of survivors and their relatives which will be an increasingly important problem in the future.[26]

Competing Interests
None Declared
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Case Report

BJMP 2010;3(2):312

Dysphagia Lusoria presenting with Pill-induced Oesophagitis - A case report with review of literature

Malhotra A, Kottam RD, Spira RS

Abstract
Extrinsic oesophageal compression from vascular structures usually remains asymptomatic. Occurrence of dysphagia is an uncommon problem. We present a rare case of dysphagia lusoria from right sided aortic arch presenting as pill-induced oesophagitis caused by a testosterone pill. A thorough literature review on both the conditions is then presented to address pathogenesis, diagnosis, and management.
Keywords
Dysphagia Lusoria, Pill-induced oesophagitis, drug-induced oesophagitis

Introduction

Oesophageal compression by a vascular structure resulting in dysphagia is uncommon. There have been multiple reports in the medical literature of almost every major vascular structure in the chest causing some degree of oesophageal compression and subsequent dysphagia[1, 2]. In 1794, David Bayford, described a case of a 62 year-old lady having dysphagia due to an aberrant right subclavian artery. He coined the term "dysphagia lusus naturae", which means "Freak of nature" [3].

Pill-induced esophagitis is associated with the ingestion of many pills and presents an uncommon cause of erosive oesophagitis [4]. Multiple different classes of drugs have been described to be hazardous to the oesophageal mucosa and cause pill-induced oesophagitis [5, 6]. Although uncommon in itself, dysphagia lusoria has not been described in literature to present as pill-induced oesophagitis. We present the first case of dysphagia lusoria causing pill-induced oesophagi's by testosterone pills in a young healthy man. Pubmed review of the English medical literature has been conducted to discuss the epidemiology, pathogenesis and management of this uncommon disorder.

Case Presentation:
A 26 year-old man with no significant past medical history presented with 5 days of dysphagia (for both solids and liquids), odynophagia and retrosternal chest discomfort. He admitted to having occasional difficulty swallowing for past 2-3 months for solids only. He denied any heartburn, cough, regurgitation, loss of appetite, weight loss, fever, chills, haematemesis or melaena. He denied tobacco or alcohol use. 2 weeks prior to presentation he had started taking testosterone pills for body-building. Physical examination was completely unremarkable.

A barium oesophagram showed extrinsic oblique compression of the oesophagus at the level of the carina as it passes through the aorta. CT scan and MRI of the chest revealed a right-sided aortic arch crossing posteriorly to the oesophagus with proximal oesophageal dilatation consistent with Dysphagia Lusoria. Endoscopy noted erosive oesophagitis/distinct ulceration extending from 18cm into a pulsatile area of narrowing at 20 cm with normal mucosa visualized distally.

Biopsies revealed oesophageal squamous mucosa with marked acute inflammation, reactive changes and no evidence of viral inclusions. Surgical management was discussed with the patient, but given the short duration of symptoms and the patient's stable weight, providing symptomatic relief with lifestyle changes, together with a trial of medications such as proton pump inhibitors were considered. At 2 weeks follow-up whilst taking proton pump inhibitors and having discontinued the testosterone pills, the patient experienced complete resolution of symptoms.

Epidemiology:

Dysphagia Lusoria: Moltz et al, found that lusorian artery has a prevalence of about 0.7% in the general population, based on the post-mortem findings[7]. Also, out of 1629 patients who underwent endoscopy for various reasons, 0.4% had a finding of a lusorian artery in a report from Fockens et al[8]. It has also been concluded based on the autopsy results and retrospective analysis of patients' symptoms during life that about 60-70% of these patients remain asymptomatic [7]. Coughing, dysphagia, thoracic pain, syncope and Horner's syndrome may develop, but usually present in old-age[9].

Pill-Induced Oesophagitis: The data on pill-induced oesophagitis is rather limited. A Swedish study found an incidence of 4 cases per 100,000 population/year[10]. Wright found the incidence of drug-induced oesophageal injury to be 3.9/100,000[11]. This may be underestimated and does not include subclinical or

misdiagnosed cases. Also, cases are reported selectively, due to clustering of cases, newly implicated pills or rare complications. The incidence today is probably much higher due to increased use of prescription medications, widespread use of endoscopy and an ageing population. All these factors limit our ability to correctly assess the true epidemiology of this iatrogenic disorder.

Pathogenesis

Dysphagia Lusoria: During embryological development, the aortic sac gives rise to six aortic arches and with further development the arterial pattern is modified and the fourth arch persists on both sides and some vessels regress. In right arch anomaly, the left arch atrophies and disappears whereas the right arch persists. If both arches persist, they form a double arch or a vascular ring encircling the trachea and oesophagus [12].

Pill-induced oesophagitis: Several lines of evidence confirm that oesophageal mucosal injury is caused by prolonged contact with the drug contents[13, 14] .On clinical grounds, patients frequently report a sensation of a pill stuck in the oesophagus before the development of symptoms and the frequent occurrence of symptoms after improper pill ingestion. Endoscopically, the evidence includes occasional observation of pill fragments at the site of injury, sharp demarcation of the injury site from the normal tissue and the frequent localization of the injury to the areas of oesophageal hypomotility or anatomic narrowing[4, 15]. Therefore factors predisposing to the drug-induced oesophageal injury can be divided into two main categories: patient or oesophageal factors [16, 17, 18,19,20,21] and drug or pharmaceutical factors as shown in tables 1 and 2 [13,14,22,23,24]. It is important to note that most patients who experience pill-induced damage have no antecedent oesophageal disorder, neither obstructive nor neuromuscular [25].It is the combination of anatomic narrowing coupled with the caustic effects of the implicated drug that caused the oesophageal injury in our case. Although testosterone pills have never been reported to cause pill-induced oesophagitis, 6 cases of corticosteroid-induced oesophagitis have been described in the literature[26] .

Table 1: Patient/Esophageal facors for pill-induced esophagitis

Old Age
Decreased Salivation
Pill intake in recumbent position
Lack of adequate fluid intake with the drug
Structural abnormalities of esophagus
Hypomobility of the esophagus

Table 2: Drug related factors for pill-induced esophagitis

Chemical structure(sustained release pills, gelatinous surface)
Formal structure (capsule increases risk over the tablet)
Solubility
Simultaneous administration of multiple medications

Clinical Presentation

Dysphagia Lusoria: As previously mentioned the disorder remains asymptomatic in majority of the patients. Symptomatic adults usually present with dysphagia for solids, (91%), chest pain (20% or less). Less commonly, patients may have cough, thoracic pain or Horner's syndrome [27,28]. In infants, respiratory symptoms are the most predominant mode of clinical presentation. This is believed to be due to absence of tracheal rigidity, allowing for its compression with resulting stridor, wheezing, cyanosis etc [9] . Richter et al. reported average age of presentation to be 48 years [27]. Various mechanisms to explain this delayed presentation have been proposed such as increased rigidity of the oesophagus, rigidity of the vessel wall due to atherosclerosis, aneurysm formation (especially Kommerell's diverticulum), elongation of the aorta etc [9, 29,30] .

Pill-induced oesophagitis: Patients with pill-induced injury usually present with odynophagia, dysphagia and/or retrosternal chest pain[4] . Symptoms can occur after several days after starting a drug, but frequently occur after the first dose. [13] .Fever and haematemesis signifying a possible mediastinal extension can occur without chest pain[32,33]. Pharyngitis due to the pill lodged in the hypopharynx has been reported[34].

Our case presents a typical example of asymptomatic Dysphagia Lusoria, who developed acute dysphagia, odynophagia and retrosternal chest discomfort immediately after the initiation of the offending agent; which is very typical of pill-induced oesophageal injury.

Diagnostic approach

Dysphagia Lusoria: The best method to diagnose an aberrant right subclavian artery presenting with difficulty swallowing is initially with a barium oesophagram followed by a CT or MRI scan. [27] .Angiography although considered gold standard for the diagnosis of vascular abnormalities is now largely supplanted by newer less invasive techniques such as CT or MR angiography. Upper endoscopy may reveal a pulsating compression of the posterior wall of the oesophagus as in our case[9, 27].

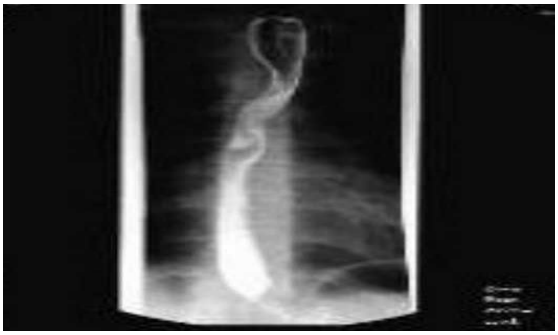

Figure 1- Barium esophagram depicting the extrinsic indentation of the esophagus as it crosses the aorta.

Endoscopic ultrasound, especially with Doppler technology may be helpful to confirm the vascular nature of the abnormality[27]. Oesophageal manometry usually shows non-specific findings.High peristaltic pressures have been reported in the proximal oesophagus above the level of the compression [9, 35].

Pill-induced oesophagitis: Barium studies can be normal, and slowing of barium column may be the only abnormality seen[31]. Double contrast studies may however, increase the yield of a positive result[36]. Kikendall et al. reported that endoscopy revealed the evidence of injury in all the patients [5] . Endoscopy most commonly reveals one or more discrete well demarcated ulcers with normal surrounding mucosa. Ulcers may range from pin-point to several centimetres in diameter[5]. Biopsies, if

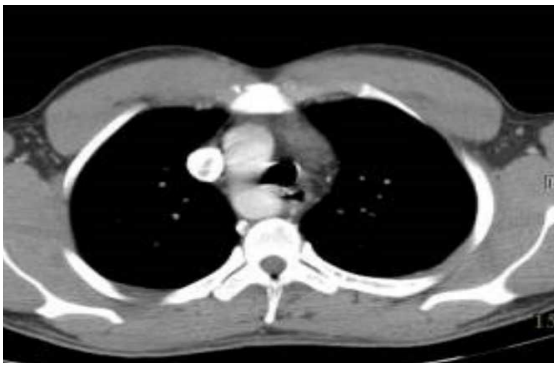

Figure 2- CT scan of the thorax demonstrating esophageal compression from a posteriorly placed aorta.

performed, help to distinguish the condition from infection and neoplasia.

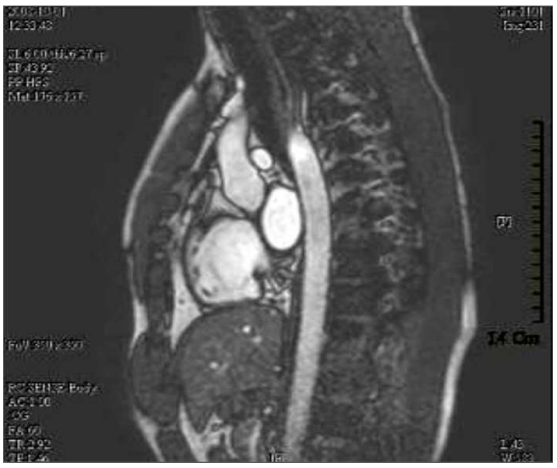

Figure 3- Magnetic resonance image showing esophageal compression with proximally dilated esophagus.

Our case shows a distinct oblique compression in the posterior wall of oesophagus on the barium study (fig 1) and classic findings on MR/CT with contrast which also excluded any other thoracic vascular abnormalities (fig 2-5). Endoscopic images of a shallow ulcer are shown in fig 6,7.

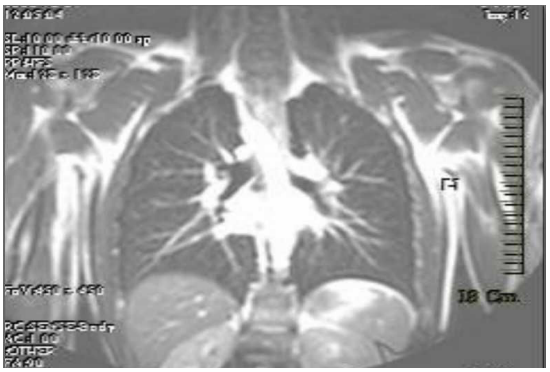

Figure 4- CT image showing the right sided origin of the aortic arch.

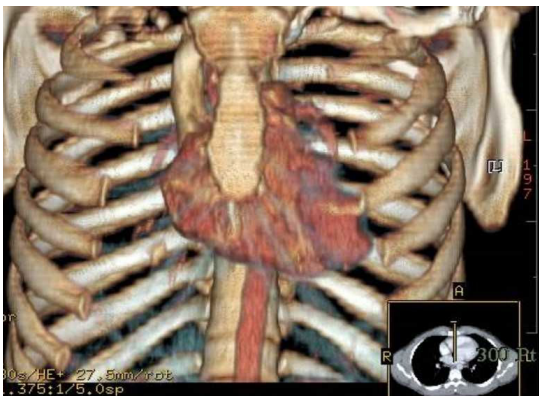

Figure 5- Three Dimensional image of the heart and the right sided approach of the arch.

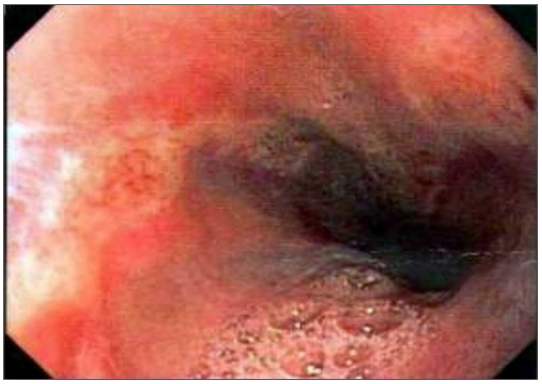

Figure 6- Endoscopic view of esophageal inflammation at the site of compression.

Figure 7- Endoscopic image of the esophageal injury using narrow band imaging.

Treatment

Dysphagia Lusoria: The treatment of patients with DL primarily depends upon the severity of symptoms. Mild to moderate cases are managed by lifestyle and dietary changes such as eating slower, chewing well, sipping liquids, weight reduction and reassurance as in our case.[9,27] Janssen et al also reported in a series of 6 patients that 3/6 improved with proton-pump inhibitor alone or in combination with the prokinetic drug cisapride [9]. Severe symptoms and failure of medical therapy may need surgical evaluation and treatment. Richter et al. reported 14/24 patients who underwent surgical repair of the aberrant vessel for DL[27] . Bogliolo et al proposed endoscopic dilation as a temporary alternative to relieve symptoms in patients who are poor surgical candidates [37] .

Pill-induced oesophagitis: Most uncomplicated cases of pill-induced oesophagitis may heal spontaneously, with resolution of symptoms in a few days to a few weeks. Withdrawal of the offending drug and avoidance of topically irritating foods such as citrus fruits, alcohol is imperative to aid healing [4, 13]. Sucralfate, topical anaesthetics, and acid suppression are often used to aid in relief of pain[4, 15]. Rarely, in severe cases, parenteral nutrition or endoscopic dilation of chronic strictures may be required. [15, 25]

Conclusion

Our case demonstrates a typical case of DL presenting with pill-induced oesophagitis who responded to conservative and acid suppressive therapy. Identifying the risk factors and adequate patient education is the key to prevention.

Competing interests
None Declared
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Case Report

BJMP 2010;3(2):317

Aorto-enteric fistulas: a cause of gastrointestinal bleeding not to be missed

Louise MacDougall, John Painter, Terry Featherstone, Claus Overbeck, Shyju Paremal and Suvadip Chatterjee

Abstract
Aorto-enteric fistulas are a rare cause of gastrointestinal (GI) bleeding. The high mortality associated with this condition and relatively low incidence make this a diagnostic and management challenge. This case report describes a classic presentation of such a case along with a discussion on the diagnosis and treatment of this condition. We hope that this will be a clinical reminder to all physicians particularly those involved in managing GI hemorrhage in an acute medical take.

Clinical Presentation

A 87-year old man was referred to hospital with a five day history of lethargy and increased urinary frequency. He denied symptoms of gastrointestinal bleeding or abdominal pain. His past medical history included diabetes mellitus, chronic kidney disease, peripheral vascular disease and surgery for repair of ruptured aortic aneurysm 6 weeks ago. Systemic examination, including per rectal examination, was normal. Haemoglobin was 83g/L and C-reactive protein was 148 (Normal <5). Twelve hours after admission he developed pyrexia (37.8 degree) accompanied with tachycardia (103 beats per minute) and hypotension (BP 87/43). Soon afterwards, he had a small amount (<50 mls) of fresh haemetemesis. He also complained of lower back pain and clinical examination revealed tenderness in the left iliac fossa. He was cross-matched for blood and initiated on intra-venous fluids. As his Rockall score was six an urgent oesophago-gastro-duodenoscopy (OGD) was planned.

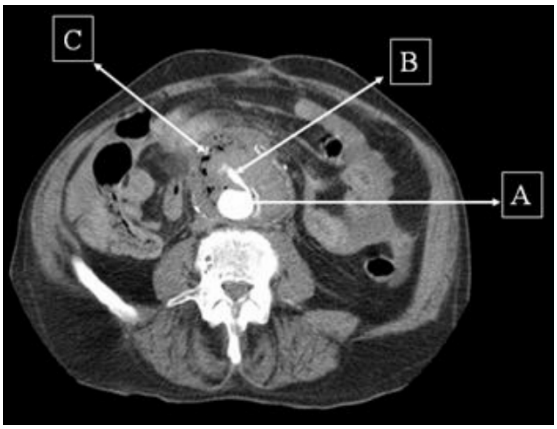

Figure 1: Contrast CT scan demonstrating the aorta (A) with extravasation of contrast (B) and a large collection (C) around it with trapped air suggestive of infection.

Over the next few hours he complained of increasing central abdominal pain and had several episodes of melaena. In view of the history of recent aortic surgery and current GI bleed the possibility of aorto-enteric fistula (AEF) was considered. An urgent contrast CT scan of the abdomen (Figure 1) was therefore arranged prior to OGD.

Contrast computed tomogram (CT) scan of the abdomen revealed an inflammatory soft tissue mass anterior to the infra-renal aortic graft with pockets of gas and leakage of contrast into it. These findings were suggestive of an AEF. The patient was informed of the diagnosis of AEF and the need for emergency surgical repair to which he consented. During the operation the vascular surgeons found that the duodenum was adherent to the aortic graft with evidence of fistulisation and infection, thus confirming the diagnosis. Although operative repair appeared to be successful, the patient continued to bleed on the table due to disseminated intravascular coagulation and died twenty fours after admission.

Discussion

AEF is defined as a communication between the aorta and the GI tract.[1] The diagnosis of AEF should be considered in every patient with a GI bleed and a past history of aortic surgery.[2] Our case patient had had emergency repair of a ruptured aortic aneurysm with a prosthetic graft 6 weeks prior to his current admission.

AEFs are a rare cause of gastro-intestinal (GI) hemorrhage. AEFs can be primary or secondary. Primary AEF (PAEF) is a communication between the native aorta and the GI tract.[1] The incidence of PAEF ranges from 0.04 to

0.07%.[3] PAEFs commonly arise from an abdominal aortic aneurysm of which 85% are atherosclerotic.[1]

Secondary AEFs (SAEF) are an uncommon complication of abdominal aortic reconstruction.[4] The incidence of SAEF ranges from 0.6% - 4%.[5] Generally two types of SAEFs have been described. Type 1, termed as true AEF develops between the proximal aortic suture and the bowel wall. These usually present with massive upper GI hemorrhage.[4] Type 2, or the paraprosthetic–enteric fistula does not develop a communication between the bowel and the graft and accounts for 15% to 20% of SAEFs.[4] In this type of fistula, bleeding occurs from the edges of the eroded bowel by mechanical pulsations of the aortic graft. Sepsis is more frequently associated with this type of AEF (75% of cases).[4] The mean time interval between surgery and presentation with SAEF is about 32 months[6] but the time interval can vary from 2 days to 23 years.[7] AEFs can involve any segment of the GI tract but, 75% involve the third part of the duodenum and the affected part is generally proximal to the aortic graft.[8]

The pathogenesis of AEF is not fully understood but two theories exist. One theory suggests repeated mechanical trauma between the pulsating aorta and duodenum causes fistula formation and the other suggests low-grade infection as the primary event with abscess formation and subsequent erosion through the bowel wall.[9] The latter theory is felt to be most likely. The majority of grafts show signs of infection at the time of bleeding and up to 85% of cases have blood cultures positive for enteric organisms.[10]

The main symptom of AEF is GI bleeding. Secondary AEFs have been traditionally said to present with a symptom triad (as in our patient) of abdominal pain, GI bleeding and sepsis; however, only 30% of patients present in this manner.[11] Patients often have a "herald bleed" which is defined as a brisk bleed associated with hypotension and hematemesis that stops spontaneously followed by massive gastro-intestinal haemorrhage in 20% – 100% of patients.[8] Sometimes the GI bleeding can be intermittent.

The commonest investigations for diagnosis of AEFs are OGD, conventional contrast CT scan and angiography.[12] OGD is often the initial investigation, as in any upper GI bleed mainly because of lack of clinical suspicion of the diagnosis. The endoscopic findings vary from those of a graft protruding through the bowel wall to fresh bleeding in distal duodenum to that of an adherent clot or extrinsic compression by a pulsating mass with a suture line protruding into the duodenum.[13] Less than 40% of patients have signs of active bleeding at OGD.[8] Conventional CT with contrast is widely available and most commonly performed to diagnose AEFs. Perigraft extravasation of contrast is a pathognomic sign of AEF and this may be associated with signs of graft infection i.e perigraft fluid and soft tissue thickening along with gas.[12] Multi-detector CT and MRI are more sensitive diagnostic imaging tools with MRI now being used mainly in patients with renal failure to avoid the use of contrast.[12]

PAEFs can be treated with endovascular stent placement in selected cases especially in those who cannot tolerate emergency surgery.[12] The treatment of choice in SAEFs is graft resection and establishment of an extra-anastomotic circulation with repair of the duodenal wall although overall survival rates vary from 30% to 70%.[13]

Conclusion

SAEFs are a catastrophic complication of aortic surgery. AEFs are relatively rare and need a high index of suspicion in the appropriate clinical situation in order to diagnose this condition. Left untreated they are universally fatal. Surgical repair carries a very high mortality.

Competing Interests
None declared
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Case Report

BJMP 2010;3(2):318

Sudden Death in a Patient with Left Atrial Myxoma: Report of two cases and review of literature

Kalgi Modi, Prasanna Venkatesh, Sujata Agnani, Tanya Rowland and Pratap Reddy

Abstract
Sudden death is known to occur in patients with primary cardiac tumours; however it is rare and is estimated to constitute 0.005% of all sudden deaths. We report here two cases of sudden death that occurred in patients with left atrial myxoma. We also present a brief review of available literature on this subject

Case 1

A 55 year old white male with a history of hypertension, hyperlipidemia, smoking and transient ischaemic attacks was admitted to the hospital with worsening dyspneoa on exertion over a period of 6 weeks. He also reported significant weight loss, loss of appetite and fatigue over several weeks. Physical examination revealed tachycardia, and moderate respiratory distress with prominent jugular venous distention. Cardiac auscultation revealed normal S1 and loud P2. Also heard were an early diastolic heart sound (tumour plop) and a mid-diastolic murmur at the apex. An ECG revealed evidence of left ventricular hypertrophy with repolarization abnormalities. A transthoracic echocardiogram (Figures 1 and 2) revealed a large, pedunculated, mobile left atrial mass measuring 3x4 cm, impinging on the mitral orifice with a mean gradient across the mitral valve of 15 mm Hg. Left ventricular systolic function was normal.

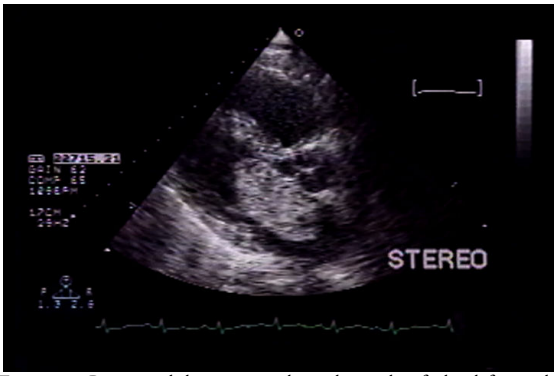

Figure 1: Parasternal long axis echocardiograph of the left atrial myxoma prolapsing into the mitral valve during diastole.

A diagnosis of probable left atrial myxoma was made. The patient had four episodes of syncope within 24 hrs, the first at 3: 53 am after returning from the bathroom, subsequently leading to cardiac arrest at 14:20 pm.

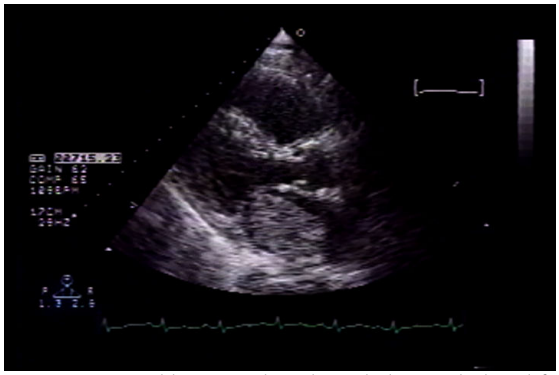

Figure 2: parasternal long axis echocardiograph showing the large left atrial myxoma during systole.

He was intubated and initiated on vasopressors. An emergent Left heart catheterization was performed prior to a referral for surgical excision, which revealed triple vessel coronary artery disease. During cardiac catheterization the patient became more hypotensive requiring an intra-aortic balloon pump. While arrangements were made for a referral for surgery, the patient's clinical condition deteriorated rapidly and he went into pulseless electrical activity at 18:54 pm and could not be resuscitated. The patient's death was presumably due to persistent intracardiac obstruction. On autopsy, the left atrial mass was identified as a haemorrhagic left atrial myxoma, 5x4x3.5cm in size attached by a stalk to an inter-atrial septum. Multiple organizsing thrombi were present in the [1]tumour. Histology showed abundant ground substance with stellate myxoma cells and haemosiderin-laden macrophages (Figures 3 and 4). The cause of death was attributed to valvular "ball-valve" obstruction.

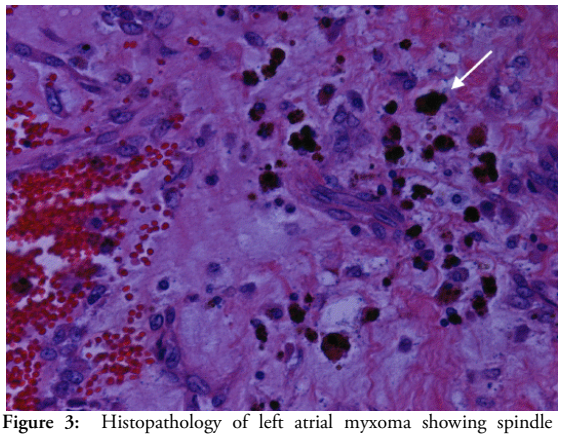

Figure 3: Histopathology of left atrial myxoma showing spindle shaped myxoma cells (white arrow) in a myxoid matrix (black arrow) and blood vessels (top arrow) (H & E 40X)

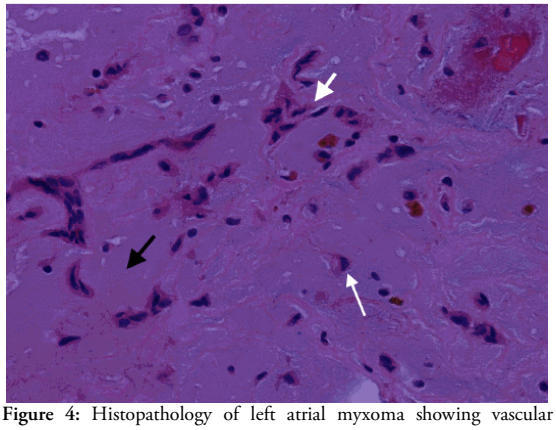

Figure 4: Histopathology of left atrial myxoma showing vascular spaces filled with relatively fresh blood and evidence of old bleeding (hemosiderin) suggesting repeated episodes of hemorrhage within the myxoma (H & E 4X)

Case 2

A 57 year old African American female presented with recurrent syncopal episodes and dyspnea on exertion, orthopnea, leg swelling, abdominal distention, loss of appetite and fatigue for the preceding nine months. Physical examination revealed jugular venous distention, a displaced apical cardiac impulse, a parasternal heave, and a loud S2. Also detected were a pan-systolic murmur at the lower left sternal border, an early diastolic heart sound with a mid diastolic murmur at the apex, bibasilar crackles, ascites, and oedema up to the thighs.

Significant laboratory values were a total bilirubin of 1.6 mg/dl, and B- Type Natriuretic Peptide of 1323 pg/ml. A chest x-ray revealed an enlarged cardiac silhouette, right lung atelectasis and effusion. An ECG revealed left atrial and right ventricular enlargement.

The patient was admitted with the diagnosis of new onset congestive heart failure and was treated with intravenous lasix, and fosinopril. A 2-D Echocardiogram revealed a large mass suggestive of myxoma in the left atrium measuring 4.5 x 7.5 cm, occupying the entire left atrium protruding through the mitral valve into the left ventricle (Figure 5) .

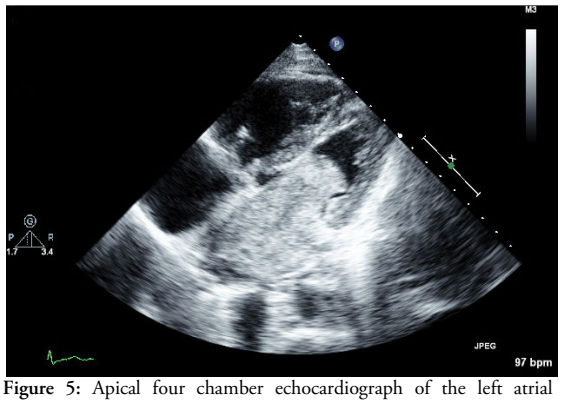

Figure 5: Apical four chamber echocardiograph of the left atrial myxoma prolapsing into the mitral valve during diastole.

This mass was obstructing flow with a mean trans mitral gradient of 17 mm Hg, with a reduced stroke volume and severe pulmonary hypertension with an estimated Right Ventricular systolic pressure of 120 mm hg. A presumptive diagnosis of left atrial myxoma was made and the patient was scheduled for its surgical removal the following morning. The patient was transferred to the intensive care unit for closer monitoring; and fosinopril and lasix were discontinued. At about 22:30 hours that night patient was noted to be hypotensive with systolic blood pressure of around 80mm Hg. The patient was treated with normal saline and concentrated albumin. She then developed acute respiratory distress at 23:00 hours requiring intubation and ventilator support. Intravenous dobutamine, dopamine and later norepinephrine were added for continued hypotension. The patient went into pulseless electrical activity, she was successfully coded with a return of her pulse but continued to be hypotensive. Cardiothoracic surgery decided not to take the patient for emergency surgery due to her unstable haemodynamic condition. The patient's family was notified of the poor prognosis and the decision was made not to resuscitate her if her condition deteriorated further. The patient ultimately became bradycardic and went into asystole at 5: 30 am. An autopsy was not performed. The cause of death was attributed to large left atrial myxoma causing valvular obstruction and cardiovascular collapse.

Discussion

These two cases illustrate an uncommon, malignant course of a left atrial myxoma with rapid progression of symptoms which proved fatal. The most common primary tumour of the heart is myxoma accounting for 40-50% of primary cardiac tumours[2,3] .Nearly 90% of myxomas occur in the left atrium[3] .In over 50% of patients, left atrial myxoma causes symptoms of mitral stenosis or obstruction. Systemic embolic phenomena are known to occur in 30-40% of patients[3] .Constitutional symptoms reported in approximately 20% of patients include myalgia, muscle weakness, athralgia, fever, fatigue, and weight loss. Around 20% of cardiac

Table 1. Summary of 17 published cases of sudden cardiac death associated with cardiac myxoma in adults (1950-2008)

Author/Reference	Year	No	Age	Gender	Symptoms	Interval Between Symptoms To Scd	Size Of Myxoma In Cm	Autopsy
Vassiliadis (8)	1997	1	17	M	Dizziness	3 months	6	yes
McAllister (10)	1978	5	40 to60	NA	NA	NA	5 to 6	yes
Cina (2)	1996	6	Below 40	NA	Embolic, syncope	16.6 months	5.7	yes
Puff (9)	1986	1	41	M	Syncope,	months	1.5	yes
Puff (9)	1986	1	19	F	Syncope	6 months	3	yes
Maruyama (7)	1999	1	20	M	Dizziness	1 day	8	None, Patient survived SCD; Myxoma resected
Turkman (6)	2007	1	73	M	DOE	months	8	yes
Ito (13)	1987	1	28	M	Syncope	7 days	NA	yes

NA: not available

myxomas are asymptomatic [3] .Severe dizziness/syncope is experienced by approximately 20% of patients due to obstruction of the mitral valve. [4] Of all the symptoms associated with cardiac myxomas, syncope is one of the most ominous prognostic indicators.

Although sudden death is known to occur in patients with primary cardiac tumour it is rare and is estimated to constitute 0.01 to 0.005% of all sudden deaths [1]. Association between sudden death and cardiac myxoma has been reported as early as 1953 by Madonia et al [5]. A review of the literature on this subject between 1950 to2008 revealed 17 cases of sudden death attributed to cardiac myxoma in adults [1, 6, 7, 8, 9, 10, 13) (Table 1)] .

In all patients with unexpected death syncope was a predominant presenting symptom and their age ranged from seventeen to seventy three. The majority of patients with sudden death were men even though the tumour is more common in women. The size of the tumour did not influence clinical presentation and in some reports of sudden cardiac death tumour was as small as 1.5 cm and without previous symptoms [3]. Sudden death in myxoma is attributed to either severe acute disturbance in cardiac haemodynamics from cardiac obstruction (ball-valve syndrome) or to coronary embolization from the tumour. The latter is probably responsible for sudden death in patients with very small tumours. In the study of Alverez Sabin et al [11] the initial neurological manifestation was Transient Ischemic Attack (TIA), but in none of the patients' was a diagnosis of myxoma made because of the initial neurological symptom. Even though cardiac myxomas are a rare cause of TIA and syncope, it is important to consider cardiac myxoma in the differential diagnosis of any patient with a TIA or syncope [11]. The patients presented here had a TIA and recurrent syncope placing them at high risk for sudden death.

The timing of surgical excision of myxoma is not clear and it is not unusual for patients to die or experience a major complication while awaiting surgery [2, 12]. Intraaortic balloon pump (IABP) use has been described in one case of left atrial myxoma and life-threatening cardiogenic shock with favorable outcome[14] .As illustrated by the cases presented here it is essential that surgery be performed urgently once it has been identified that a patient has a myxoma that is large enough to cause complete intracardiac obstruction.

Acknowledgements
David Baldwin, Marlissa Curtis, Mike Yates and Baryl Cowthran for images IRB approved
Competing Interests
None declared
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BJMP 2010;3(2):313

Education & Training

From student to tutor in Problem Based Learning: An unexplored avenue

Prabhu N Nesargikar

Abstract
Problem Based learning (PBL) has redefined the role of a tutor, from being a teacher in the traditional 'pedagogy' style of learning to a facilitator in the 'andragogy' approach. This has often led to 'tutor difficulties' in accepting, and adapting to this transition. Faculty training remains critical for successful implementation of a PBL based curriculum, and considerable resources are exhausted in teaching new tutors the art of facilitating a PBL group. The aim of this article is to explore the concept that a PBL tutor coming from a PBL background may be beneficial compared to faculty training, and this concept is supported by a literature review that identifies common characteristics between a PBL student and a PBL tutor.

Introduction:

Problem based learning (PBL) has been an important development in health professions education in the latter part of the twentieth century. Since its inception at McMaster University[1] (Canada), it has gradually evolved into an educational methodology being employed by many medical schools across the globe[2,3]. PBL presents a paradigm shift in medical education, with a move away from 'teacher centered' to 'student centered' educational focus. The assumptive difference between a pedagogy learner and an androgogy learner (Table 1) was summarised by Knowles[4], and the androgogy approach underpins PBL. This shift has redefined the role of a teacher in the PBL era, from being a teacher to a facilitator.

Table 1: Differences between Androgogy and Pedogogy learner (Knowles)

Characteristics	Pedagogy	Androgogy
Concept of the learner	Dependent personality	Self-directed
Readiness to learn	Uniform by age-level & curriculum	Develops from life tasks & problems
Orientation to learning	Subject-centered	Task- or problem-centered
Motivation	By external rewards and punishment	By internal incentives curiosity

It is well known that implementing PBL as an educational methodology required additional resources compared to a traditional lecture based curricula[5]. In addition, there was a need to recruit and train a large number of tutors to facilitate the PBL process[6].Training PBL tutors is an important component of a successful curriculum change, and is a continuous process. Training workshops and role plays were employed to train conventional teachers, but challenges were faced in developing them into effective PBL tutors[5].

The aim of this paper is to evaluate the literature for any evidence supporting the theory that a PBL background student may develop into an effective PBL tutor. The Medline, EMBASE and CINHAL databases were searched to look for any pre-existing literature or research supporting this theory.

Results:

To the best of my knowledge, there has been no reported evidence supporting this theory. With limited literature evidence, this paper aims to identify common grounds between a PBL student and a PBL tutor, and whether being a PBL student may contribute to the overall development as a PBL tutor. The discussion evolves around the following domains:

1. Teaching Styles:

The ideal teaching style of a PBL tutor is a facilitative-collaborative style, which augments and supplements the PBL process. The teaching style inventory developed by Leung et al[7] hypothesised four domains of teaching styles: the assertive, suggestive, collaborative and facilitative styles. Though a PBL tutor assumes himself in possessing this style (facilitative), it does not necessarily match with the students perceptions, as reported by Kassab et al[8].

Some of the characteristics of being a PBL student may foster the development of a collaborative teaching style. Being a student, you are expected to be a collaborative learner which is critical for achieving and improving group performance[9]. Initial years as a student in PBL may contribute to developing attributes required to develop a preferential teaching style.

2. Facilitating critical thinking:

PBL is grounded in cognitive psychology and is set out to stimulate curiosity and build durable understanding. One of the

roles of the tutor is to foster critical thinking and enhance the group's ability to analyse and synthesise the given information. This attribute stems from the tutors ability to facilitate, rather than teach. Irby[10] opined that clinical teachers tended to teach as they themselves were taught using traditional approaches, which may affect the process of stimulating critical thinking among the students.

A tutor from a PBL background would have the ability to think critically, through a process of developing thoughtful and well-structured approach to guide their choices[11]. Tiwari et al[12] showed in their study that PBL students showed significantly greater improvement in critical thinking compared to traditionalist courses. Hence, prior exposure to a certain learning style can create a cognitive psychology that can contribute to tutor development.

3. Group dynamics:

One of the prime roles of a PBL tutor is to facilitate the PBL process by keeping the group focused on tasks, and guiding them to achieve their goals. Tutors who are skilled in group dynamics are evaluated more highly than those who are not so skilled[11,13] . Tutors need to develop sound appreciation of the group dynamics, failing which may lead to fostering uncertainty with in the group. Bowman et al[13] commented about the lack of consideration on the emotional implications placed on prospective PBL tutors when tutoring small groups, especially the skills required to balance between short term anxieties and potential serious problems. This imbalance which usually serves as unconscious incompetence may affect group dynamics.

PBL students would have experience of group dynamics and the pressures of working within it. They would have developed a model of working with members with varying attributes. Blighet al[14] showed in their study that students from a PBL curriculum rated themselves better in team working and motivation compared to conventional course peers. This highlights the fact that an apprenticeship model may be necessary in developing the right skills to be an effective tutor.

Table 2: Common ground

Ideal PBL student	Ideals of a PBL tutor
Knows his role within a group	Would help in identifying different roles students may play
Knows to ask empowering questions	Would help in guiding groups in achieving learning objectives
Monitors his own progress by self evaluation and motivation	Would help in monitoring individual progress and motivate group
Bonds with other members to achieve goals	Would help in building trust and encourage bonding of group members
Develops thoughtful and well structured approach to guide choices	Would help in facilitating critical thinking
Fosters collaboration with other group members to create a climate of trust	Would facilitate collaborative teaching style

The characteristics of a student that may foster ideal attributes in a PBL tutor are briefly summarised in Table 2, and has evolved from the work of Samy Azer[9,11] .

4. Tutor training

Considerable resources are exhausted in teaching new tutors the art of facilitating a PBL group[6], and the usual cohort is teachers from a conventional taught background. The shift from didactic expertise to facilitated learning is difficult for those tutors who feel more secure in their expert role. Finucane et al[5] published their study which showed that only a minority of staff had volunteered to be PBL tutors, possibly reflecting the fact that absence of prior exposure to PBL style of learning may have contributed to this. In spite of tutor training workshops, they could only retain 73% at the end of two years.

Prior exposure as a student may help negate much of the stigma associated with PBL. They would have observed and learnt from their PBL tutors, and would have analysed their contribution to the PBL process. They could reflect on their experience and evolve into an ideal PBL tutor. This would help in minimising resource expenditure and contribute towards retention of staff.

5. Tutor comfort zones:

PBL contextualises learning to practical situations, with integration across disciplinary boundaries. Dornan et al[15] reported on how some teachers felt PBL to be a frustrating drain on time as it did not fit their educational style, and was a distraction from clinical teaching, demonstrating the 'conditioning effect' of prior experiences. This further fuels the debate between content vs. process expertise, but prior knowledge of the process would benefit the students and the PBL process.

6. Role modeling:

Role models have long been regarded as important for inculcating the correct attitudes and behaviors in medical students. Being an ideal role model is considered as one of the prime requisites of a teacher. In a recent study, Mclean et al[16] showed that PBL students tended to have a higher percentage of role models compared to students from a traditional programme (73% vs. 64%). In an ideal setting, a "content and process expert" would be the perfect role model for the PBL students, but this may not be realised in all settings.

Paice et al[17] commented on the resistance to change within the medical profession, and highlighted the need for training to emphasise the values and attitudes required. This puts an added emphasis on the tutor to demonstrate tenacity and virtues to be an effective role model, avoiding 'cognitive clouding' from previous experiences.

As a PBL student, they would be exposed to variety of PBL tutors. They would have incorporated the good points of an effective PBL tutor, and would have reflected on the negative aspects. Reflective practice enables them to develop the right attributes. Though these attributes may be difficult to develop through training workshops, having a background of PBL education may help mould the tutor characteristics.

Conclusion:

As PBL continues to be employed across different specialties, there would be increased emphasis on the medical schools to match the resources needed to implement it. There is an argument for developing an apprenticeship model or recruiting tutors from PBL background, which would help in reducing the cost in training new tutors, along with nullifying the negative influences a new tutor may bring. The biggest limitation in the present setting is finding a cohort of PBL background tutors, but an apprenticeship model may benefit teachers from conventional background. A prospective research study exploring the attributes of tutors, successful and less successful, from traditional, PBL and hybrid curricula and those who have crossed the Rubicon from traditional to PBL can effectively answer this question.

Competing Interests
None declared
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BJMP 2010;3(2):314

Preparing for the MRCPsych CASC - an insight based on experience

Abrar Hussain and Mariwan Husni

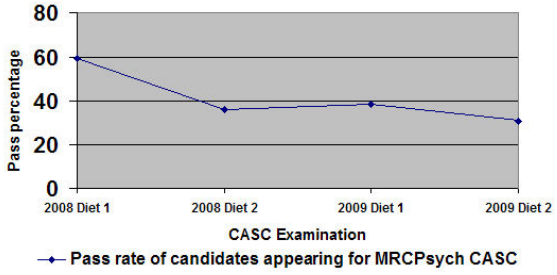
Abstract
The Clinical Assessment of Skills and Competencies (CASC) is the final examination towards obtaining the Membership of the Royal College of Psychiatrists (MRCPsych). It assesses skills in history taking, mental state examination, risk assessment, cognitive examination, physical examination, case discussion and difficult communication.[1] The CASC is the only clinical examination, having replaced the earlier format, which had clinical components at two stages.

Background

The Royal College of Psychiatrists first introduced the CASC in June 2008. It is based on the OSCE style of examination but is a novel method of assessment as it tests complex psychiatric skills in a series of observed interactions.[2] OSCE (Observed Structured Clinical Examination) is a format of examination where candidates rotate through a series of stations, each station being marked by a different examiner. Before the CASC was introduced, candidates appeared for OSCE in Part 1 and the 'Long Case' in Part 2 of the MRCPsych examinations. The purpose of introducing of the CASC was to merge the two assessments.[3]

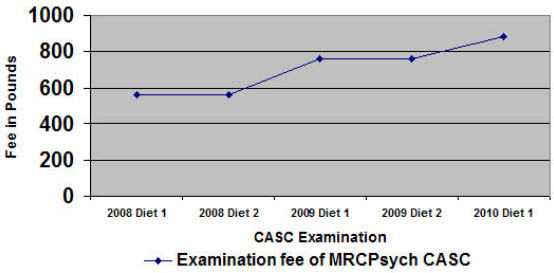
The first CASC diet tested skills in 12 stations in one circuit. Subsequently, 16 stations have been used in two circuits - one comprising eight 'single' and the other containing four pairs of 'linked' scenarios. Feedback is provided to unsuccessful candidates in the form of 'Areas of Concern'.[4] The pass rate has dropped from almost 60% in the first edition to around 30% in the most recent examination (figure 1). Reasons for this are not known. The cost of organising the examination has increased and candidates will be paying £885 to sit the examination in 2010 in the United Kingdom (figure 2).

Figure 1



We are sharing our experience of the CASC examination and we hope that it will be useful reading for trainees intending to appear for the CASC and for supervisors who are assisting trainees in preparation. In preparing this submission, we have also made use of some anecdotal observations of colleagues. We have also drawn from our experience in organising local MRCPsych CASC training and small group teaching employing video recording of interviews.

Figure 2



CASC is an evaluation of two domains of a psychiatric interview: 'Content' (the knowledge for what you need to do) and 'Process' (how you do it). The written Papers (1, 2 and 3) test the knowledge of candidates. We therefore feel that the candidates possess the essentials of the 'Content' domain. Therefore, the more difficult aspect is demonstrating an appropriate interview style to the examiner in the form of the 'Process'.

This article discusses the preparation required before the examination followed by useful tips on the day of the examination.

Before the examination day (table 1)

The mindset

In our view, preparation for the CASC needs to begin even before the application form is submitted. Having a positive mindset will go a long way in enhancing the chances of success.[5] It is therefore a must to believe in ones ability and dispel any negative cognition. Understandably, previous failure in the CASC can affect ones confidence, but a rational way forward would be to consider the failure as a means of experiential

learning, a very valuable tool. Experiential learning for a particular person occurs when changes in judgments, feelings, knowledge or skills result from living through an event or events.[6]

Time required

Starting to prepare early is crucial as it gives time to analyse and make the required changes to the style of the interview. For instance, a good interview requires candidates to use an appropriate mixture of open and closed questions. Candidates who have been following this technique in daily practice will find it easier to replicate this in examination conditions when there is pressure to perform in limited time. However, candidates who need to incorporate this into their style will need time to change their method of interview.

Analysing areas for improvement

Candidates need to identify specific areas where work is needed to improve their interview technique. The best way to accomplish this is by an early analysis of their interview technique by a senior colleague, preferably a consultant who has examined candidates in the real CASC examination. We think its best to provide feedback using the Royal College's 'Areas of Concern' - individual parameters used to provide structured feedback in the CASC. This will help to accustom oneself with the expectation in the actual examination.

Requesting more than one 'examiner' to provide feedback is useful as it can provide insight into 'recurring mistakes' which may have become habit. In addition, different examiners might provide feedback on various aspects of the interview style. The Calgary-Cambridge guide[7, 8] is a collection of more than 70 evidence-based communication process skills and is a vital guide to learn the basics of good communication skills.

Practice

We believe that it is important to practice in a group setting. Group work increases productivity and satisfaction.[9] The aim of group practice is to interact with different peers which will help candidates to become accustomed to varying communication styles. Group practice is more productive when the group is dynamic so that novelty prevails. Practising with the same colleagues over a period of weeks carries the risk of perceiving a false sense of security. We feel this is because candidates get used to the style of other candidates and, after a period of time, may not recognise areas for improvement.

Another risk of a static group is candidates may not readily volunteer areas for improvement - either because they may feel they are offending the person or, more importantly, because the same point may have been discussed multiple times before! Whenever possible, an experienced 'examiner' may be asked to facilitate and provide feedback along the lines of 'Areas of Concern'. However candidates need to be conscious of the pitfalls of group work and negative aspects such as poor decisions and conflicting information.

In addition to group practice, candidates would benefit immensely from individual sessions where consultants and senior trainees could observe their interview technique. Candidates could interview patients or colleagues willing to role-play. We have observed that professionals from other disciplines like nurses and social workers are often willing to help in this regard. Compared to group practice, this needs more effort and commitment to organise. Consultants, with their wealth of experience, would be able to suggest positive changes and even subtle shifts in communication styles which may be enough to make a difference. We found that video recording the sessions, and providing feedback using the video clips, helps candidates to identify errors and observe any progress made.

The feedback of trainees who appeared in the CASC examination included that attending CASC revision courses had helped them to prepare for the examination. It is beyond the remit of this article to discuss in detail about individual courses. The majority of courses employ actors to perform role-play and this experience is helpful in preparing for the CASC. Courses are variable in style, duration and cost. Candidates attending courses early in their preparation seem to benefit more as they have sufficient time to apply what they have learnt.

Table 1: Tips before the examination day

Factor	Technique
- The mindset	- Have a positive attitude
- Time required	- Start preparing early
- Analysing areas for improvement	- Use 'Areas of Concern'
- Practice	- Group setting and individual sessions - Feedback from colleagues using video

During the examination (table 2)

Reading the task

Inadequate reading and/or understanding of the task leads to poor performance. Candidates have one minute preparation time in single stations and two minutes in linked stations. We have heard from many candidates who appeared in the examination that some tasks can have a long history of the patient. This requires fast and effective reading by using methods such as identifying words without focusing on each letter, not sounding out all words, skimming some parts of the passage and avoiding sub-vocalisation. It goes without stating that this needs practice.

CASC differs from the previous Part 1 OSCE exam in that it can test a skill in more depth. For example it may ask to demonstrate a test for focal deficit in cognition that may not be

detected by conducting a superficial mini mental state examination.

Candidates need to ensure they understand what is expected of them before beginning the interview. In some stations, there are two or three sub-tasks. We believe that all parts of a task have a bearing on the marking.

An additional copy of the 'Instruction to Candidate' will be available within the cubicles. We suggest that when in doubt, candidates should refer to the task so that they don't go off track. Referring to the task in a station will not attract negative marking but it is best done before initiating the interview.

Time management

It is crucial to manage time within the stations. A warning bell rings when one minute is left for the station to conclude. This can be used as a reference point to 'wrap up' the session. If the station is not smoothly concluded before the end of the final bell candidates may come across as unprofessional. Candidates also run the risk of losing valuable time to read the task for the next station.

Single stations last for seven minutes and linked stations last for ten minutes. Candidates who have practiced using strict timing are able to sense when the warning bell will ring. They are also able to use the final minute to close the session appropriately.

Having stressed the importance of finishing the stations on time, it is also vital to understand that an early finish can lead to an uncomfortable silence in the station. This may give the examiner the impression that the candidate did not cover the task. We feel that there will always be something more the candidate could have explored!

The awkward silence in the above scenario can potentially make the candidate feel anxious and ruminate on the station which must be avoided.

The golden minute

First impressions go a long way in any evaluation and the CASC is no different in this regard.[10] Candidates need to open the interview in a confident and professional manner to be able to make a lasting impact and establish a better rapport. Observing peers, seniors and consultants interacting with patients is a good learning experience for candidates in this regard.

Candidates who do well are able to demonstrate their ability to gain the trust of the actors in this crucial passage of the interaction. Basic aspects such as a warm and polite greeting, making good eye contact, and clear introduction and explanation of the session will go a long way in establishing initial rapport which can be strengthened as the interview proceeds.

The first minute in a station is important as it sets the tone of the entire interaction. A confident start would certainly aid candidates in calming their nerves. Actors are also put at ease when they observe a doctor who looks and behaves in a calm and composed manner.

Leaving the station behind

Stations are individually marked in the CASC. Performance in one station has no bearing on the marking process in the following stations. It is therefore important not to ruminate about previous stations as this could have a detrimental effect on the performance in subsequent stations. The variety of tasks and scenarios in the CASC means that candidates need to remain fresh and alert. Individual perceptions of not having performed well in a particular station could be misleading as the examiner may have thought otherwise. Candidates need to remember that they will still be able to pass the examination even if they do not pass all stations.

Expecting a surprise

Being mentally prepared to expect a new station is good to keep in mind while preparing and also on the day of the examination. Even if candidates are faced with a 'surprise station', it is unlikely that the station is completely unfamiliar to them. It is most likely that they have encountered a similar scenario in real life. Maintaining a calm and composed demeanour, coupled with a fluent conversation focused on empathy and rapport, will be the supporting tools to deal with a station of this kind.

Table 2: Tips during the examination

Factor	Technique
- Reading the task	- Fast and effective reading - Focus on all sub-tasks
- Time management	- 'Wrap up' in the final minute
- The golden minute	- Establish initial rapport
- Leaving the station	- Avoid ruminating on previous station
- Expecting a surprise	- Fluent conversation with empathy

Conclusion

The CASC is a new examination in psychiatry. It tests a range of complex skills and requires determined preparation and practice. A combination of good communication skills, time management and confident performance are the key tools to achieve success. We hope that the simple techniques mentioned in this paper will be useful in preparing for this important examination. Despite the falling pass rate, success in this format depends on a combination of practice and performance and is certainly achievable.

Competing Interests
Abrar Hussain is actively involved in organising the local CASC revision and MRCPsych course in Northwest London. Mariwan Husni is actively involved in organising the local CASC revision and MRCPsych course in Northwest London. He is also a CASC examiner for The Royal College of Psychiatrists.

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Viewpoint

BJMP 2010;3(2):319

Psychiatry in Limbo: New Ways of Talking

Francis J Dunne

Some things don't change

'Everyone thinks of changing the world, but no one thinks of changing himself.' Leo Tolstoy (1828-1910)

Readers surely must have noticed by now how 'client', 'service user', 'customer', and other business terms have gained momentum in health care settings over the years. Newspeak has insidiously worked its way into all health policy documents. For reasons that escape me, in mental health services particularly, there seems to be an unwritten diktat that hospital personnel use any terminology other than 'patient' for those attending for treatment. Anyone who sets foot inside a hospital is now deemed to be a service user even though the word patient (from the Latin, *patiens*, for 'one who suffers') has not changed its meaning for centuries. Yet curiously, management Newspeak is not questioned or discussed openly by medical or nursing staff, perhaps for fear of being labelled old-fashioned, trying to cling on to relics of a bygone era. Subtle, unspoken, 'nannying' of health professionals in general, and a casual, perfunctory dismissal of matters medical now seem to be the order of the day.

The term 'patient' is now viewed sceptically by some in the management hierarchy as depicting an individual dependent on the nurse or doctor, rather than a token of respect for that person's privacy and dignity. Non-clinical therapists are not obliged to use the term patient. What follows from that however, is the abstruse rationale that it is probably best to describe everyone as a 'client', 'customer', or 'service user' so as not to appear judgemental or create confusion. This apparently avoids 'inferiority' labelling and ensures all are 'treated' the same. Using the term 'patient', implies a rejection by doctors of multi-disciplinary team working, we are led to believe. There is a perceived, albeit unfounded notion, that the medical profession want to dominate those with mental healthproblems in particular by insisting on a biological model of illness and, by inference, pharmacological 'chemical cosh' treatments. At the heart of all this mumbo-jumbo lies the social model of care with its aim of 'demedicalising' the management of mental illness. This, ironically, seems at odds with medical practice where the emphasis has always been on a holistic approach to patient care. Yet an insistence on a social model of mental illness is as patronising to the patients that hospital managers purport to be caring for, as is the imagined 'disempowerment' model they want to dismantle. Some in the health management hierarchy contend that the word 'patient' fits poorly with today's views of 'users' taking an 'active part' in their own health care.[1] Or does it? One may decide to have the cholecystectomy or the coronary bypass, when the acute cholecystitis and chest pain respectively have settled down, and select the time and date of the procedure, but I doubt whether one has any real 'choice' in the matter when the condition becomes critical, or that one will play an active part in the procedure itself.

The concept of empowerment, which has been around for decades, also seems to be enjoying a renaissance, being one of the current buzzwords in 'modern' health care. Other buzz phrases, among many, include 'freedom of choice', 'equity', 'right to participation', 'increased role of the consumer.' Empowerment, theoretically, enables new customers to stand up for themselves, demand their therapeutic rights and choose their own treatment. Fine when you are well. However, should I develop a serious illness, particularly one in which I have no great expertise, and because I cannot conceivably amass the entire body of medical knowledge before I see the doctor or nurse about my condition, I would prefer the physician/nurse to outline the treatment plan. I do not want to be called a client, customer or punter, because such derisory terms are more apt to make me feel, ironically, 'disempowered'.

Why the change?

'If you want to make enemies, try to change something.' Woodrow Wilson (1856-1924)

What is it about doctors using the word 'patient' that health managers and non-medical therapists find so irritating and difficult to accept? Perhaps the answer lies in the doctor-patient relationship, akin to the attorney-client privilege afforded to the legal profession, so loathed by the judicial system. We are being swept along on a current of neutral, incongruous words such as 'client' (the most popular at present), 'service user' (this applies across the board), 'consumer' (Consuming what? I know my rights!), 'customer' (Do I get a warranty with this service? May I return the goods if they are unsatisfactory?) Better still, 'ambulatory health seekers' (the walking wounded) and 'punters' (a day at the races). The general trend it seems is for doctors to name one attending an appointment as 'patient,' midwives opt for 'people', social workers tend to speak of the

'service user', psychologists and occupational therapists prefer 'client', and psychoanalysts sometimes use the rather cumbersome description 'analysand'. What is usually forgotten is that the person waiting in the analyst's reception is no different from the humble stomach-ache sufferer.[2]

To most people 'service user' infers someone who uses a train or bus, or brings their car to a garage or petrol station. The term 'user' often denotes one who exploits another; it is also synonymous with 'junkie' and a myriad of other derogatory terms for those dependent on illegal drugs; 'client' has ambiguous overtones, and 'people' refers generally to the population or race, not to individuals receiving treatment. For general purposes a 'client' could be defined as a person who seeks the services of a solicitor, architect, hairdresser or harlot. There is also talk of 'health clients'. Someone who goes to the gym perhaps! A customer is a person who purchases goods or services from another; it does not specifically imply an individual patient buying treatment from a clinician. Try to imagine the scenario of being told in your outpatient setting that a client with obsessive compulsive disorder, or a service user who is psychotic, or a customer with schizophrenia, is waiting to be seen. Although it is defies belief, this is how non-medical therapists portray patients. Would a medical doctor describe a person with haemorrhagic pancreatitis as a customer? Picture a physician and psychiatrist talking about the same person as a patient and customer respectively. Patients make appointments with their general practitioners. In psychiatry the terms are an incongruous depiction of the actual clinic setting in that most patients are not consumers or customers in the market sense; indeed many have little wish to buy mental health services; some go to extraordinary lengths to avoid them.[3] Those who are regarded as in greatest need vehemently avoid and reject mental health services and have to be coerced into becoming 'customers' through the process of the mental health act.

What do our medical and surgical colleagues make of all this? Despite Newspeak insidiously weaving its way through other specialties, it does not seem to have permeated medicine or surgery to the same extent. Is psychiatry therefore alienating itself even further from other fields in medicine by aligning itself with this fluent psychobabble? Do cardiologists refer to patients with myocardial infarctions as customers? Does a patient with a pulmonary embolism or sarcoidosis feel more empowered when described as a punter? Changing the name does not address the illness or the factors in its causation. Perhaps one could be forgiven for using terms other than 'patient' for someone who wants plastic surgery to enhance their facial appearance, or a 'tummy tuck' to rid themselves of fatty tissue induced by overindulgence, or in more deserving cases, successive pregnancies. Readers will have no difficulty adding to the list. Such people are not ill. However, when describing a person with multiple myeloma, acute pulmonary oedema, intravascular disseminated coagulopathy or diabetic ketotic coma, I'm not so sure 'consumer' or 'ambulatory health client,' fits the profile. After all, a customer usually wants to 'buy something' of his/her own choosing. Now this may apply to 'gastric banding' or silicone implants, but there is not much choice on offer when one is in a hypoglycaemic coma or bedridden with multiple sclerosis.

Despite the above, when people were actually asked how they would prefer to be described by a psychiatrist or by a general practitioner,67% and 75% preferred 'patient' respectively.[4] Another survey revealed a slightly higher preference (77%) for 'patient'.[5] One might argue that such results depend on the setting where the surveys were carried out and by whom. However, logic dictates that if I am in the supermarket waiting to be served, I would assume I am a customer; while attending the general practitioner's surgery for some ailment, I would imagine I am there as a patient. Such surveys are conveniently ignored by service providers. So what does it matter? It matters because the lack of direct contact between managers and patients puts the former at a great disadvantage and leads one to question their competence and credibility when accounting for patient preferences. Perhaps managers should 'shadow' physicians and surgeons to fully understand why the people they treat are called patients. Psychiatry is not a good example of normal medical practice since so many of its adherents possess the illusory fantasy of being 'experts in living', and not physicians whose aim is to diagnose and treat.

Be patient

'The art of medicine consists in amusing the patient while nature cures the disease.' Voltaire (1694-1778)

It is noticeable that 'patient' remains the preferred usage by the media, press, and cabinet ministers, and of course, by medical and surgical teams. The implicit meaning of the word 'patient' is that someone is being cared for, and the media at least seem to respect this. Ironically, in the field of mental health, clinicians will often write letters to other professionals referring to an ill person as a 'patient' in one paragraph, and a 'client' in the next! Doubt and equivocation reign. It is as if the stigma of mental illness will evaporate if we gradually stop talking about sufferers as patients, and 'empower' them by describing them as 'customers.' There is ambiguity in the terminology itself. The term service user is the most disliked term among those who consult mental health professionals.[6] The terms are also used interchangeably, with 'customers' and 'service users' described in the same breath. What do we call a drug-user? - a service user drug-user or a drug-user service user, a customer who uses drugs, or a drug-using customer? How does one accurately describe an individual using alcohol and illegal drugs? Is an infant suffering from respiratory distress syndrome or a child moribund with bacterial meningitis an active participant in his/her health care? In theory, they are service users. What about young people among whom substance misuse is

prevalent?[7] Do we label and stigmatise them as drug clients or drug customers? Will the outpatient and inpatient departments be redesignated as out-service or in-service user clinics? Oxymoronic terms such as 'health clients' do not convey any meaning when applied to hospital patients. Doubtless, critics with their customary predictability will lamely and with gloating schadenfreude, accuse the medical profession of bemoaning their loss of hegemony in health care matters, but their arguments are specious, stem from a lingering resentment of the medical profession, and amount to little.

In other areas of health some argue that making choices about lifestyle, and seeking advice on matters such as fertility, liposuction, gastric banding, or cosmeticsurgery, do not require one to be called a patient, and rightly so. Such information is freely available at clinics and on the Internet, and therefore does not require the advice of a doctor per se, until the actual procedure is imminent. However, it would be inconceivable for a patient undergoing say, a laparoscopic bypass or sleeve mastectomy for obesity, not to heed the views of the surgeon performing the procedure itself, the success rate, and complications. Whether to have the operation is a different matter. Similarly, individuals who want to engage in psychological therapies such as cognitive or psychoanalytic, or who would rather indulge in an expensive course of 'emotional healing', can choose for themselves. Neither does one need to see a nurse practitioner or general practitioner for a mild upper respiratory tract infection. Such people are not suffering from any serious medical illness (an enduring feeling of being physically or mentally unwell) in the true sense of the word.

When all is said and done, most people are unschooled in etymology, and condemning words because of their remote origins is pointless. Words change in meaning over time. Often they take on a new meaning, all too obvious in teenage slang. The word 'wicked' used to mean sinful, now it refers to something 'cool' (another word that has changed its meaning). Besides, if 'patient' really is that offensive, it seems odd that it has retained unchallenged supremacy in the United States, the centre of consumerist medicine, where the patient is quite definitely a partner.[8]

Physicians do not want to return to the days of paternalistic and condescending medicine, where deferential, passive patients were at the mercy of the stereotypical omniscient, omnipotent doctor or nurse matron. Likewise, patients do not want to be treated like products in order to achieve targets for the government health police. Patients nowadays are generally more confident and better informed about their conditions, in other words, already empowered, than in days gone by, particularly with the advent of the Internet (alas, here misinformation also abounds) and this is welcome. Therefore, if you are relatively well you can choose a treatment to suit your lifestyle. Unfortunately, not many patients suffering from chronic illnesses, for example, schizophrenia in some cases, or a degenerative condition such as motor neurone disease, feel empowered. I might feel empowered when I can decide to have one therapy or another, say, cognitive as opposed to solution-focussed therapy. I somehow doubt whether I would feel equal in status to, or more empowered than, the surgeon who is performing a splenectomy on me for traumatic splenic rupture.

The thrust of all this is that nothing is thought through; everything consists of 'sound bites' and 'catchphrases', and the sound bites become increasingly absurd the more one scrutinises the terminology. The medical and nursing profession should only be tending to people who are ill or recovering from illness. Of course other staff are directly or indirectly involved in patient care and follow-up. Physiotherapy is a good example. Nonetheless the title patient remains the same. Therefore let us be clear about the definition: those who suffer from an illness are patients; those who are not ill can be called service users, or whatever term takes your fancy.

Competing Interests
None declared
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E-Interview

BJMP 2010;3(2):321

Online Interview with Professor David Kingdom

David Kingdom is a Professor of Mental Health Care Delivery at University of Southampton and Honorary Consultant Psychiatrist to Hampshire Partnership Foundation Trust.

How long have you been working in your speciality?
30 years

Which aspect of your work do you find most satisfying?
Clinical work can be very stimulating but so can research particularly when you feel, rightly or wrongly, that you have contributed something original which can benefit patients.

What achievements are you most proud of in your medical career?
Developing cognitive behaviour therapy for people with psychosis and then seeing it gradually becoming part of accepted practice in many parts of the world.

Which part of your job do you enjoy the least?
Doing reports and filling in forms.

What are your views about the current status of medical training in your country and what do you think needs to change?
Generally I think there have been many positive developments of it especially in improving the interaction between patients, health care staff and doctors but there is still a real problem with conveying the importance of psychological aspects.

How would you encourage more medical students into entering your speciality?
I would like to see psychology being increasingly accepted as a relevant qualification on a par with other sciences.

What qualities do you think a good trainee should possess?
Intelligence and warmth.

What is the most important advice you could offer to a new trainee?
Spend as much time learning from patients and their carers as you can.

What qualities do you think a good trainer should possess?
Intelligence and warmth.

Do you think doctors are over-regulated compared with other professions?
No, although revalidation may be going that way.

Is there any aspect of current health policies in your country that are de-professionalising doctors? If yes what should be done to counter this trend?
No – we need to maximise the efficiency of our work and this will mean gradual change in roles of ourselves and others.

Which scientific paper/publication has influenced you the most?
'Not made of wood' by Jan Foudraine, a Dutch psychiatrist who spent time listening to patients in long-stay hospitals and drawing out the extraordinary stories of their lives.

What single area of medical research in your speciality should be given priority?
Psychological treatments for currently treatment resistant conditions.

What is the most challenging area in your speciality that needs further development?
Classification of mental disorders.

Which changes would substantially improve the quality of healthcare in your country?
Introduction of effective care pathways which are linked directly to outcome measurement and funding contingent on these.

Do you think doctors can make a valuable contribution to healthcare management? If so how?
Yes – by seeing that clinically effective interventions are made available to those who can benefit from them.

How has the political environment affected your work?
Funding has improved over the past decade but is now looking much more uncertain.

What are your interests outside of work?
Family, sailing & watching Southampton FC.

If you were not a doctor, what would you do?
Law probably as it also involves work with people and is a steady job.

Letter to the Editor

BJMP 2010;3(2):322

Oral Oxygenating Airway

Mohamed Daabiss and Nashat ElSaid

Immediate postoperative care of patients undergoing nasal surgery, e.g. septoplasty or rhinoplasty, could be hazardous as desaturation happens frequently especially if the patient is not fully recovered struggling for nasal breathing while the nose is packed with gauze.[1,2] Moreover, ice may be applied to the nose in the operating room to decrease swelling, and an external splint could be taped by the surgeon onto the patient's face.[3] All make it difficult to apply and fit a Hudson recovery face mask in the post-anaesthesia care unit (PACU) to maintain adequate oxygenation.

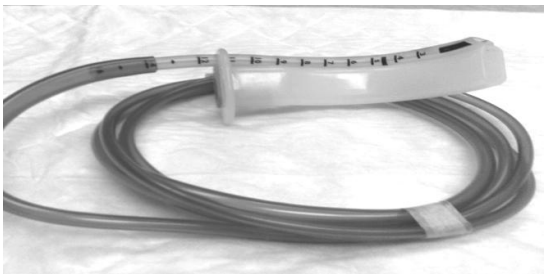

Figure 1

Facing this problem, we prepared an oral oxygenating airway device, to maintain an open unblocked airway in addition to adequate oxygenation, in the early recovery period for patients undergoing nasal surgery. Our device (Fig 1,2) is an oral airway size 4 or 5 with a siliconised soft endotracheal tube (ETT) size 5.5 mm fixed alongside the airway with its bevel directed laterally to provide easy insertion of the airway. The distal end of the ETT is cut 4-5 cm from the airway to be connected to a breathing circuit through a 15 mm connector or connected directly to tubing of oxygen flow-meter supplying humidified oxygen at a low flow rate of 1-2 L/minute to provide FIO_2 35-40%. This device was tried successfully in 54 patients scheduled to septoplasty and rhinoplasty.

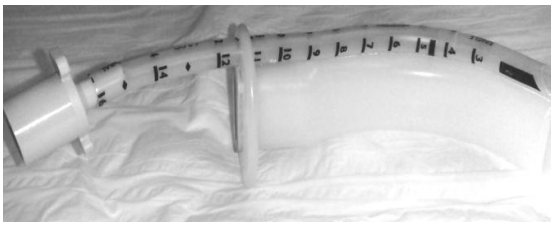

Figure 2

In conclusion, this device is simple, cheap, easily inserted, efficiently maintains adequate arterial oxygen saturation as long as the oral airway is tolerated in the early recovery period, reduces the oxygen flow rate and, in addition, an oxygen analyzer can be connected to the 15 mm connector to provide monitoring of the delivered FIO_2.

Competing Interests
None declared
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