

Availability of computerised reminders in primary care doesn't reduce heart-failure repeated hospitalisations

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ABSTRACT

Computerised reminders can be a support for clinical improvement. We verified their effect on heart-failure (HF) re-hospitalisation rate. **Methods and Results:** A software (Millewin®) widely used in Italian general practice embedded an automatic reminder to help general practitioners (GPs) to identify HF patients and to prescribe them with recommended drugs. This reminder system was already activated in the first 2004 release, but required voluntary activation in the successive releases. We had no possibility to know who decided to keep using the reminders. We examined the 2004-2009 HF hospitalisations in Puglia, a Southern Italian Region with a population of over 4000000, and with high HF hospitalisation rate compared with the Italian mean⁷. We compared the hospitalisations for patients cared for by GPs who used Millewin® in 2004 to those of the patients cared for by GPs who never used Millewin®. Data were provided by the local Health Authority, and were extracted from the administrative database. Users of Millewin® cared for 4969 patients (mean age 76 y, sd 12; 48.6% men), the non-users cared for 48781 patients (mean age 76 y, sd 11; 50% men): no significant difference as far as age and gender are concerned. We examined 17810 patients with ≥ 2 hospitalisation. No difference in re-hospitalisations was observed. **Conclusions:** Availability of computerised automatic reminders aimed to improve detection of HF patients and prescription of recommended drugs doesn't decrease repeated hospitalisation; these tools should be probably part of a more complex strategy, such as a long-term audit. **KEYWORDS:** Computerised reminder; heart failure; hospitalisation

INTRODUCTION

The widespread use of office-software in general practice makes the idea of simple, automatic computerised support an attractive one. Different tools for different diseases have been tested with mixed results, and in 2009 a Cochrane review¹ concluded that "Point of care computer reminders generally achieve small to modest improvements in provider behavior. A minority of interventions showed larger effects, but no specific reminder or contextual features were significantly associated with effect magnitude". One year later another review² reached similar conclusion: "Computer reminders produced much smaller improvements than those generally expected from the implementation of computerised order entry and electronic medical record systems". Despite this, simple, non-expensive, automatic reminders are frequently part of GPs' software, even if their real usefulness is seldom tested in real life.

Repeated hospitalisation for heart failure is an important problem for every National Health System; it is estimated that about half of all re-hospitalisation could be avoided³. Adherence to guidelines can reduce re-hospitalisation rate⁴, and pharmacotherapy according to treatment guidelines is associated with lower mortality in the community⁵. In 2004 a software commonly used in Italian primary care implemented a simple reminders' system to help GPs to improve prescription of drugs recommended for heart failure. We evaluated if this could lead to a decrease in re-hospitalisation rate.

METHODS

In 2003, using Millewin®, a software commonly used by Italian GPs, we showed that appropriate prescription could increase using a simple pop-up reminders⁶; a year later, using the Italian General Practitioners database 'Health Search – CSD Patient database (HSD) (www.healthsearch.it), we observed a lower than expected prevalence of codified diagnosis of heart failure and of prescription of both beta-blockers and ACE-Inhibitors/ARBs (data on file). Therefore in 2004 Millewin® embedded a simple reminder system to help heart failure (HF) management. The first reminder aimed to identify patients with HF, but without codified diagnosis: in case of loop diuretic and/or digoxin prescription without codified HF diagnosis a pop-up told the GP that the patients could be affected by HF and invited the physician to verify this hypothesis and eventually to record the diagnosis. The second reminder appeared when a patient with codified HF diagnosis had no beta-blocker and/or ACE-inhibitor/ARB prescription: a pop-up invited the GP to prescribe the missing drug. This reminder system was already activated in the 2004 release of the software, but required voluntary activation in the successive releases. This is a common choice in real life, where positive choices in clinical practice by software-house neither are welcomed nor accepted by GPs. We had no possibility to know who decided to keep using the reminders.

We examined the 2004-2009 HF hospitalisations in Puglia, a Southern Italian Region with a population of over 4000000, and with high HF hospitalisation rate compared with the Italian mean⁷. We compared the hospitalisations for patients cared for by GPs who used Millewin® in 2004 to those of the patients cared for by GPs who never used Millewin®. Data were provided by the local Health Authority, and were extracted from the administrative database.

RESULTS

We identified 64591 patients (mean age 76 y, sd 12; 49.9% men) with one or more HF hospitalisation; 17810 had ≥ 2 hospitalisations, and were analysed for the current study.

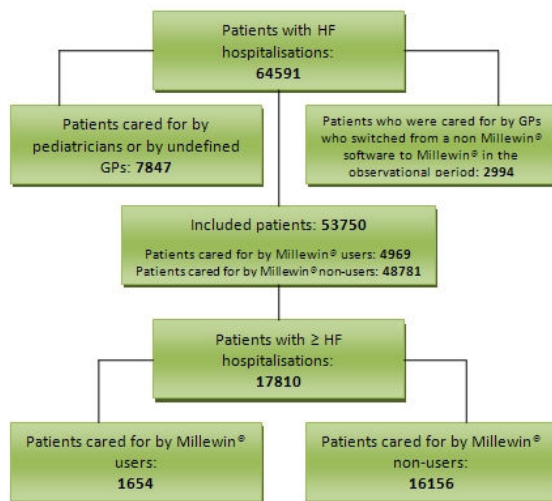


Figure 1 - Selection process leading to the identification of the patients with ≥ 2 HF hospitalisations

The selection that led to this group is summarised in figure 1. There was no statistically significant difference between patients cared for GPs using or non using Millewin® software as far as age and gender are concerned. The re-hospitalisation rate according to the use or non-use of Millewin® of patients' GPs is summarised in table 1.

Table 1: Re-hospitalisation rate of patients cared by Millewin® users and non-users

	Patients with ≥ 2 hospitalisation (N, %)			
Time	No MW users	MW users	Total	P
Within 1 year	11260 (23.1%)	1136 (22.9%)	12396 (23.1%)	=N.S.
Within 2 years	13851 (28.4%)	1410 (28.4%)	15261 (28.4%)	=N.S.
Within 3 years	15144 (31.0%)	1543 (31.1%)	16687 (31.0%)	=N.S.
Within 4 years	15803 (32.4%)	1612 (32.4%)	17415 (32.4%)	=N.S.
Within 5 years	16083 (33.0%)	1643 (33.1%)	17726 (33.0%)	=N.S.
Within 6 years	16156 (33.1%)	1654 (33.3%)	17810 (33.1%)	=N.S.

MW = Millewin®, N.S = Not significant

The mean time before the first re-hospitalisation was 108.5 day \pm 103.3 for Millewin® non-users and 116.4 \pm 107.5 for users ($p < 0.05$).

DISCUSSION

Even if reasonable and clinically sound, the availability of computerised reminders aimed to help GPs to identify HF patients and to prescribe them with recommended drugs didn't reduce re-hospitalisation rate. The first possibility to explain this result is that, after the first year, GPs didn't re-activate the reminders' system. Unfortunately we couldn't verify this hypothesis, but it is known that the level of use of such a system may be low in usual care⁸; furthermore providers may agree with less than half of computer generated care suggestions from evidence-based CHF guidelines, most often because the suggestions are felt to be inapplicable to their patients or unlikely to be tolerated⁹. Epidemiological studies have shown that heart failure with a normal ejection fraction is now a more common cause of hospital admission than systolic heart failure in many parts of the world¹⁰⁻¹¹. Despite being common, this type of heart failure is often not recognised, and evidence based treatment—apart from diuretics for symptoms—is lacking¹². It is therefore possible that increasing ACE-I/ARBs and beta-blockers use in these patients doesn't influence the prognosis and hospitalisation rate. Unfortunately administrative databases do not permit to distinguish the characteristic of HF. We must also consider that the use of appropriate drugs after HF hospitalisation could spontaneously increase in the last years; a survey in Italian primary care showed that 87% of HF patients used inhibitors of the renin-angiotensin system, and 33% beta-blockers¹³. A further relevant increase in ACE-I/ARBs is therefore unlikely, while a improvement is clearly needed for beta-blockers. Could more complex and information-providing reminders be more useful? This is unlikely since adding symptom information to computer-generated care suggestions for patients with heart failure did not affect physician treatment decisions or improve patient outcomes¹⁴. Furthermore, consultation with a cardiologist for starting beta-blocker treatment is judged mandatory by 57% of Italian GPs¹³, thus reducing the potential direct effect of reminders on prescription. Finally we must remember that part of the hospitalisation due to HF worsening can be due to non-cardiac disease, such as pneumonia, anemia, etc; all these cause cannot be affected by improved prescription of cardiovascular drugs.

Albeit simple and inexpensive, computerised reminders aren't a neutral choice in professional software. Too many pop-ups may be disturbing and may lead to systematic skipping the reminders' text. This can be a problem, since computerised reminders have proved to be useful for other important primary-care activity, such as preventive interventions¹⁵. In our opinion, at the moment, a computerised reminder-system should be proposed only as a part of a more complex strategy, such as long-term self or group audit and/or pay for performance initiative.

CONCLUSIONS

Availability of computerised automatic reminders aimed to improve detection of heart-failure patients and prescription of recommended drugs doesn't decrease repeated hospitalisation; these tools should be probably tested in the context of a more complex strategy, such as a long-term audit.

Competing Interests

None declared

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