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The Effect of Computer-assisted Prescription on Critical Care Unit

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Abstract

Objective: To determine if computer-assisted prescription (CAP) reduces the frequency of prescription errors in the Intensive Care Unit (ICU) of Belgrano Hospital.
Method: A retrospective analysis was used to compare errors between computer-assisted and handwritten prescriptions (HWP) in 98 Medical indications: 43 handwritten and 55 Computer-assisted ones. Prescriptions were reviewed by expert staff. The items to be considered are: 1- incorrect information, 2- incorrect dose, 3- missing information, 4- illegibility.

Results:

1- Incorrect information HW=20,93% - CA=5, 45 %,

2- Incorrect dose HW=6, 98 % - CA=0%,

3- Missing information HW=18, 60% - CA=3, 64 %,

4- Illegibility HW=18, 60 % - CA=0 %.

Conclusions: Computer-assisted prescriptions sensibly reduce medical prescription errors compared to handwritten prescriptions. We found a total of 41, 86 % errors in handwritten medical prescriptions versus just 7, 27 % in computer- assisted ones.

Keywords:

prescription drugs; medication errors; computer-assisted medication systems

Introduction

In this work we propose to determine in what proportion computer-assisted prescription (CAP) reduces errors in medical indications if we compare it with hand-written medical prescription (HWP) in Intensive Care Unit (ICU) at Belgrano Hospital in Buenos Aires, Argentina.

Computer-assisted prescription (CAP) avoids main causes of medical errors at the moment of prescribing and/or making indications, because it basically avoids mechanical work of data transcription not only by doctors, who update indications given the previous days, but also by nurses' and pharmaceutics' work. CAP ends with discrepancies produced by data interpretation and transcription. It constitutes an indispensable election tool to improve quality in medical attention optimizing safety in patients and, in that way, diminishing expenses caused by medical errors.

CAP (computer-assisted prescription) integrated with CCH (computerized clinical history) not only optimizes processes and reduces mistakes in medication, but also constitutes a fundamental support for decision taking and allows detecting interaction between drugs-taking by patient.

Advantages and benefit-cost which CAP enjoys at present are, in a way, affected by some legal aspects. There are existing contradictions between vanguard law and Digital Signature Law 25.506 and General Law of medicine exercise (law Nº 17132) which in its article 19 sub-sections 7 reads: "Prescriptions shall be hand-writing, in Spanish, dated and signed". This fact at present complicates the situation of **physicians who use CAP** because they run the risk of being sanctioned.

With this work we hope to make a contribution so that legislators review this kind of impediment which constitutes an attempt against modernization and health and life of patients.

Materials and methods

Intensive care unit is formed by two bodies and a CAP system. Not all professionals use this system because of different reasons which go from lack of aptitude to accept these new information technologies to manifest criticism to CAP. So as to objectively determine if there are advantages between CAP and HWP, a retrospective analysis was used over an amount of 98 medical indications in ICU (intensive care unit) registered during the first quarter of 2006.

Analyzed variables are:

1- **Incorrect information:** information which is not relevant for patient treatment and which can lead to confusion or those indications which do not belong to a patient and have been prescribed by mistake.

2- **Incorrect doses:** Doses calculated by mistake or indications wrongly transcribed.

3- **Omissions:** Lack of any of the elements in the indications, for example, when forgetting to make a transcription.

4**- Illegibility:** When two or more members from the committee cannot understand one or more words.

Results

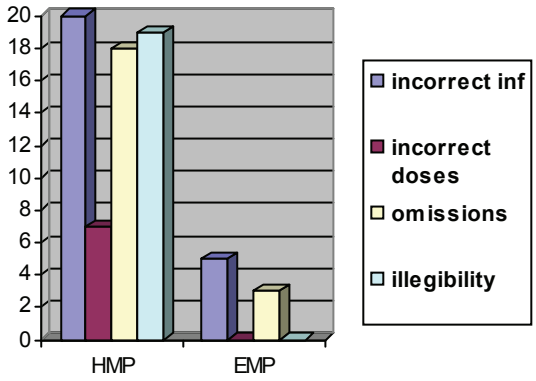
According to our controls, the results obtained are: incorrect information (HWP) = 20,93 % (CAP) = 5,45%, incorrect doses (HWP) = 6,98 % (CAP)= 0%,

Omissions (HWP) = 18,60 % (CAP)= 3,64%,

Ilegibility (HWP) = 18,60 % (CAP)= 0%.

Total of prescription mistakes (HWP) = 41,86 % (CAP)= 7,27%.

The difference between HWP and CAP is significant giving p <0,001



Discussion

Results are eloquent: 41% of mistakes in HWP vs. 7% in CAP. Main causes in this difference are illegibility problems and mistakes in transcription in daily indications. It is important to consider that in many works it is indicated that Medical Error has an important incidence in morbidity and mortality of patients and longer permanence of patients in hospital so it has a high incidence in increase of health costs basically for bad administration and limitless resources use.

Conclusions

To incorporate CAP to daily practice, it will be necessary to count with the digital signature of the physician; in this way it will be used as a legal proof tool. It is important to consider that a wrong manual indication could generate, for omission, illegibility, loss, damage or other, a medical mistake which produces a bad praxis with a morbidity and health cost easily avoidable if CAP is used.

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