Patient misadventures caused by prescription errors detected at a brazilian community pharmacy

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Background: Efforts to reduce medication errors in healthcare have been widespread around the world with the aim to improve the quality of care. Failures observed at the prescription phase are reported as being the most prevalent preventable errors. Adverse events related to inappropriate prescriptions are an important threat to patient safety. In this context, a community pharmacist is in a strategic position to evaluate, detect, and correct faults that may have occurred during prescribing. Consequently, this reduces the risk of negative clinical and economic outcomes. **Objective**: To identify the consequences of prescription errors that impede drug dispensing at a Brazilian community pharmacy for the perspective of patients. **Method**: We conducted a cohort study, with no comparison group, in a Brazilian community pharmacy, which included patients with prescription errors which made it impossible for correct drug dispensing. Patients were interviewed at the time of problem detection and followed up until an outcome was reached. **Results**: Of the 32 interviewed patients, 23 (71.9%) reported some damage to their health due to a delay in starting treatment, and 19 (59.4%) experienced extra expenses due to medication not being dispensed. **Conclusion**: Prescription errors that preclude the dispensing of any medication can lead to negative clinical outcomes and a financial loss to patients.

Keywords: Medication Errors; Patient safety; Community Pharmacy Services.

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Introduction

Medication errors are amongst the most common failures affecting patients undergoing treatment by healthcare teams. They may occur at one or more steps in the therapeutic process, including prescription, dispensing, preparing, and administration of medication, or may even be concerned with the patient's adherence (1){, 2007 #19}. In the United States, it is estimated that at least 1.5 million people are exposed to medication errors, and approximately 177 million dollars are spent annually on drug-related morbidity and mortality (2, 3).

Among medication errors, those that occur at the prescription stage are most frequent and predispose the occurrence of failures in the consecutive stages of the drug use process since they happen during the initial steps (4). These features cause prescription errors to be associated with threats to patient safety and demonstrate that avoiding failures at the prescription stage is one of the most important measures to prevent medication errors(5). However, despite widespread information about prescription errors and all risks they may have on health, most recent studies still report high rates of this type of medication error. For example, in patients from outpatient clinics, 12-56% of prescriptions present at least one error (5, 6).

Studying medication errors and their causes has been an important tool to identify opportunities for the improvement of the medication process, with a consequent reduction in the risks and costs associated with these adverse events(7). However, this information has evidently not been sufficient to convince health managers and prescribers to invest in changes that can reduce prescription errors to acceptable rates. This is because most of the prescribing errors presented in previous studies are detected and resolved before directly reaching patients and severe health damage has not been reported (8). Therefore, misadventures experienced by patients due to prescription errors are neglected by healthcare professionals, especially in the cases of low-income patients covered by public health systems(7, 9-11).

Notwithstanding the difficulty in demonstrating most relevant outcomes produced by prescription errors, some of these errors may be easily monitored and their results can be measured. A prescription error that makes it impossible to dispense a drug is a temporary obstacle for medication access. This impediment leads to the need for returning to the prescriber in order to ask for a new corrected prescription. Thus, a delay is expected in starting the treatment and extra expenses are accrued for returning to the prescriber(11, 12). The outlay will be directly related to the difficulty in accessing the health service(13).

This study aimed to identify the consequences of prescription errors that impede drug dispensing at a private Brazilian community pharmacy for the perspective of patients.

Methods

A cohort study without a comparison group was performed with users of a community pharmacy in a city located at North East Brazil over four months. The pharmacy operates from Monday to Saturday from 7 am to 10 pm, and on Sundays from 7 am to 6 pm. Pharmacists cover the entire operation time on business days. They work half day on Saturdays and are not present on Sundays.

In Brazilian pharmacies, the medicines can be purchased through three procedures: 1) Verbal request, without presentation of a prescription; 2) Simple presentation of the prescription, although not mandatory; 3) Presentation and retention of the prescription, which is restricted to substances subject to special control and antimicrobials, according to Brazilian laws. In the specific cases of narcotics, psychotropics, retinoic substances for systemic use, and immunosuppressive drugs, the sale is made exclusively by the presentation of the prescription and retention of a document issued by the prescriber called 'Notification of prescription' (16). At the end of the working day, the obtained prescriptions are reviewed by the pharmacist and stored in the establishment for two years and have to be made available for regulatory inspections. In Brazil, there is no requirement for the drugs to be sold exclusively by pharmacists or even for the training of a pharmacy technician to perform such an activity. Therefore, 'pharmacy auxiliaries' sell most drugs, a common practice in Brazilian community pharmacies (14).

Pharmacy users, 18 years and older, were invited to participate in the study if they have tried to pur-

chase a drug by presenting a prescription with errors that made it impossible to dispense at least one of the prescribed drugs. Users whose prescriptions presented unreadable corrections in the date, or whose prescription lacked a 'prescription notification' when it was needed were excluded from the study, in order to exclude possible tampering produced by the users themselves and that could be mistaken as errors. Users were also excluded when the error was identified to be lack of date, because in such cases, the dispensing is not impossible, as reported by the pharmacy team.

Data collection was performed only on business days between 2 pm and 6 pm. The entire pharmacy team was asked to forward all users with prescription errors that foreclosed the dispensing to the collector. Those who fit the inclusion criteria were invited to participate in the study and asked to sign the ICF. After the agreement, data collection was started by asking patients to complete a pre-prepared questionnaire, composed of fields for information regarding their demographic and economic data, clinical history, and the detected error. Thereafter, each study participant was contacted daily until the respondent reported a definition for the problem and the follow-up was completed. These definitions may be: acquisition of the drug from another pharmacy without substitution of the prescription, return to prescriber to correct the error and subsequent acquisition of medication, or no return to prescriber and ceasing of the treatment. The study project team neither used data that identified the prescriber nor established contact with the prescribers. Some of the medications that were not dispensed due to prescription error were identified and grouped under the first level of the Anatomical Therapeutic Chemical (ATC) Classification system (20), while those medications whose prescriptions were illegible were left unidentified.

This study was approved by the local ethics committee under registry number: CAAE 31537014.3.0000.5556.

Results

In the study period, 110 users fitted the inclusion criteria, of whic h 32 (29.1%) confirmed their participation in the study. There were 87 drugs prescribed, with a mean of 2.7 ± 1 (Md ± SD) drug for each prescription. Table 1 shows the sociodemographic characteristics of the study population.

Table 1. General characteristics of users of the private community pharmacy in the study.

Characteristics	n	%
Sex		
Male	17	53.1
Female	13	46.9
Age (years)		
18 to 39	14	43.7
40 to 60	18	56.3
Total family income (US$)		
≤8300	3	9.4
284 to 56600	8	25.0
5670 to 84900	9	28.1
85000 to 11320	4	12.5
≥ 11320	4	12.5
No answer	4	12.5
Prescriber category		
Doctor	30	93.8
Dentist	2	6.3
Type of health service		
Private	17	53.1
Public	15	46.9
Cause of attendance		
Infection	11	34.4
Psychiatric disorder	7	21.9
Pain/ Inflammation	6	18.8
Other	4	12.5
Cardiovascular disorder	3	9.4
Neurological disorder	1	3.1

From the 32 prescriptions, 20 (62.5%) were handwritten. Among the drugs that were no longer dispensed, eight (25%) could not be identified because they were prescribed illegibly (all handwritten). The other drugs were grouped in the first level of the ATC Classification system(15), and are listed in Table 2.

Table 2. Anatomical Therapeutic Chemical (ATC) class of non-dispensed medication due to prescriptions erros at the private community pharmacy.

ATC class	N	%
Anti-infective	10	31.3
Nervous system	9	28.1
Cardiovascular system	2	6.3
Muscoloskeletal system	2	6.3
Dermatologicals	1	3.1
Illegible	8	25.0
Total	**32**	

Table 3. Type of prescription erros identified that impeded drug dispensing

Type of error	n	%
Incorrect dose	14	43,7
Illegible prescription	8	25,0
Lack of prescriber data	4	25,0
Incorrect prescription form	2	6,3
Incorrect dosage form	2	6,3
Erasure	1	3,1
Non-existent drug	1	3,1
Total	32	

Nine patients (28.1%) reported no health impairment. All of them had been attended to by a private health service and were able to return to the prescriber the same day of the non-dispensing of the prescription. Among the 24 (75.0%) patients who tried to return to the prescriber, 16 (66.7%) reported difficulties in rescheduling a new appointment. The time to return to the prescriber ranged from 0 to 17 days and the mean time in public establishments was 8 ± 6.9 days (Md ± SD), while in private establishments the mean was 2.17 ± 3.1 (Md ± SD) days.

The eight users who purchased the drug at another pharmacy reported not having been seen by a pharmacist. Table 4 presents the main outcomes reported by users affected by prescription errors.

Table 4. Outcomes reported by the pharmacy users after their medications were not been dispensed because prescription erros.

Reported outcome	n/N	%
Returned to the prescriber	18/32	56,3
Spent time for return to health service days		
<1	6/18	33.3
1 to 5	7/18	38.9
6 to 10	3/18	16.7
>10	2/18	11.1
Purchased drug in other pharmacy	8/32	25.0
Remained untreated	6/32	18.7
Reported significant health damage	23/32	71.9
Reported extra expenses	19/32	59.4

Discussion

This study demonstrated that prescription errors that preclude dispensing of drugs at community pharmacies unfeasible, impaired access to medications and, as a consequence, produce clinical and economic harm to patients. Among the 32 users included in the study, 23 (71.9%) reported worsening of symptoms and of these, one (3.1%) reported the need for hospitalization. All of these associated the negative outcome to the delay at the beginning of pharmacotherapy.

In general, studies that primarily investigated prescription errors often look at identification, categorizing, and cause definition. Conversely, this study provides a description of clinical and economic outcomes generated by these errors for the perspective of the patient. This approach may be a tool to demonstrate that failures at the time of prescription can increase the risk of negative outcomes related to pharmacotherapy because those failures are source of other errors that begin during drug administration and can even affect the access to a needed medication. This information must be used to foment the implementation of processes that improve the safety of the whole medication cycle, from the decision-making to the monitoring of the patient (16).

Purchasing the medication in other pharmacies using the same prescription containing an error, as opposed to returning to the prescriber, was reported by 25% of the participants. This number must be attributed to the model of selling drugs in private community Brazilian pharmacies where, according to a study conducted in a city in North East Brazil, only 23.6% of all drugs were dispensed by a pharmacist and the remaining were sold by someone at a lower grade than technician. The absence of the pharmacists, or the restrictions placed on their ability to prescribe in Brazilian community pharmacies, is alarming since he/she is the only professional able and licensed to dispense drugs,. In fact, this failure in Brazilian pharmacies shows a weakness in the process of medication prescribing, because it demonstrates an oversight in the early detection of errors in the prescription assessment conducted by the pharmacist.

Several studies have associated prescription errors with extra expenses accrued for institutions or health systems(5, 7, 17). In view of the method used in this study, and the hesitation of some participants to report the amount of money spent, it was impossible to quantify their financial loss. However, based on the report of 19 (59.4%) participants, it was demonstrated that prescription errors are also source for unnecessary expenditure because the medicines were not dispensed. These costs had resulted from travel expenses for returning the prescription to the prescriber or

another pharmacy, the need to reschedule attendance with another professional (doctor), and the purchasing of a wrong medication at another pharmacy.

Among the identified problems, 14 (43.8%) were related to the drug dosage forms. Of these, six (42.9%) occurred due to omitting the dosage on the prescription, when more than one dosage form was commercially available, and eight (57.1%) were due to the use of non-existent dosage forms. These data are similar to those found in previous studies, in which such classified errors ranged from 18.2% to 59.8% (18-20). The large number of drugs and dosages available on the market leads to an increase in this type of error and produces the need for checking manuals containing information about medicines, a practice that is not commonly adopted due to the lack of time and overwork of prescribing professionals (21, 22).

High rates of illegible prescriptions were identified in this study. The illegibility of prescriptions is one of the primary causes of failures in communication between the prescriber and the pharmacy team, which leads to misinterpretations and, consequently, enhances the risk of dispensing and administration errors(23). These errors are also the cause for misunderstanding the prescription by the patient, which affects their adherence to the treatment(24). All prescriptions with some illegible data were handwritten. Relevantly, the use of computerized prescriptions is cited as a way of minimizing the difficulties of understanding and solving these problems (25). Unfortunately, this is still not a widely used technology in Brazilian health services, especially in the public health system.

The lack of prescriber data, such as lack of graphic marking and signatures, makes the communication between pharmacists, patients, and prescribers difficult, especially in situations where treatment doubts arise (19). This type of carelessness contributes to the excessive and illicit use of medicines, as it allows adulterations of the prescription, as well as suppressing the legal value conferred on the document (10).

The total time spent by the patients in returning to prescribers ranged from 0 to 17 days. Patients who related no worsening of symptoms were those who managed to get the new prescription on the same day that the error was detected by the pharmacist or, at the most, returned the next day. The delay in initiating treatment can bring serious risks to the patient since often medications are essential to the maintenance or improvement of health conditions, productivity, and general wellbeing (26).

The therapeutic classes with the highest rate of errors in prescriptions were anti-infectives and drugs that act on the central nervous system, according to the ATC classification. This was expected in view of the greater rigor defined in dispensing these drugs because, for most of them, the dispensing is conditioned to the withholding of the prescription or notification and accountability to the sanitary authority.

One limitation of the study was that all data regarding financial expenses and health losses were self-reported. Thus, it was not possible to measure the expenses or damage to the patients' health produced by the delay in starting the treatment. The large number of users who refused to participate in the study could be described as another limitation. However, we consider that this is not a source of bias since, even in a small number of individuals; it was possible to identify an expressive number of reports of preventable losses.

Conclusion

Prescription errors that make it impossible to dispense drugs produced clinical and financial losses from the patient's point of view. Implementing procedures that reduce the chance of errors during the prescription process and ensuring that all patients are attended to by a pharmacist can decrease medication errors and drug-related adverse events.

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