RESEARCH ARTICLES

Medical prescription pitfalls of acute upper respiratory infections in government health care facilities in Zambia

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Prescribing of medicines is one of the most important clinical task that is complex and consists of a mixture of sub-competences such as principles of clinical pharmacology, knowledge, skill, critical judgement among many others. Prescription errors, potentially serious and non-serious, have been reported in the United Kingdom hospitals among both junior and senior doctors. The aim of this study was to evaluate pitfalls in medical prescriptions of acute upper respiratory tract infection in Zambia. Medical/dental students attended government healthcare facilities and requested for medical prescriptions to enable them purchase medications for their acute upper respiratory tract infection or sore throat. A total of 80 (77.7%) students out of 103 participated in the survey. This study has demonstrated gross drug misuse as all the healthy medical and dental students who presented at government healthcare facilities with complaints of acute upper respiratory tract infection were given medical prescriptions. Only a small proportion of patient's prescription had addresses indicated (16.7%) and not all (87.1%) had patients' names written on the prescriptions. Only a small proportion of prescriptions (28.5%) had generic names indicated on the prescriptions. More than half of prescriptions in this study did not have prescribers' names (54.7%), identification numbers (73.2%) and addresses or departments (71.7%). This study demonstrated over prescription and drug misuse. A large proportion of prescriptions had no identification of both patients and prescribers. Furthermore, only a small proportion of prescriptions were written using generic names making generic substitutions at pharmacy outlets a challenge.

Introduction

Prescribing of medicines is one of the most important clinical task performed by most healthcare professionals including new doctors upon completion of their medical training [1]. Prescription errors, potentially serious and non-serious, have been reported in the United Kingdom (UK) hospitals among both junior and senior doctors [2]. Prescribing errors has made the World Health Organisation (WHO) to produce a six-step model of prescribing to assist prescribers practice safe and effective prescribing [3] rather than simply transcribing. In addition,

a detailed list of prescribing sub-competences than the ones contained in the WHO model has been produced to assist prescribers [1]. Therefore, it is now well recognised that prescribing is a complex clinical practice that consists of a mixture of sub-competences such as principles of clinical pharmacology, knowledge, skill, critical judgement among many others [4].

Many studies in the UK among medical students and foundation year doctors have shown that prescribing is sub-optimal [5-7]. Consequently, educational interventions applying the WHO model have been used and have shown to improve prescribing performance [8,9]. Consequently, the UK has realised that there is need to strengthen clinical pharmacology and therapeutics (CPT) curriculum for tomorrow's doctors training [10]. It is clear that writing a prescription starts from making a diagnosis and not just a matter of simply transcribing as indicated in established prescribing models [1,3].

Until quite recently, there has been only one medical school in Zambia. Presently, there are almost half a dozen medical schools in Zambia including public and private institutions. In addition, there are many foreign trained healthcare professionals practising in both public and private healthcare facilities. Therefore, it is imperative to evaluate prescribing pitfalls in Zambia including the extent of medication errors, polypharmacy, adverse drug reactions, potential drug-drug interactions and common prescription pitfalls. The ministry of health (MoH) has published national guidelines to prescription writing in the Zambia National Formularly (ZNF) [11]. The ZNF is produced to reflect the Zambia National Medicines Policy as a reference document to promote rational prescription. In addition, the ZNF is expected to assist in keeping the cost of medication reasonable, affordable and reduce adverse drug effects.

No study has been done in Zambia, so far, to determine the common pitfalls in medical prescriptions written by medical practitioners. The aim of this study is to evaluate pitfalls in medical prescriptions of acute upper respiratory tract infection in Zambia. Findings from this study will facilitate in design or implementation of educational programs to promote safe and rational prescribing habits in Zambia among medical prescribers.

Methods

This was a cross sectional study conducted between March 2014 and April 2014. As a method of teaching, all the 103 students received 10 copies of the questionnaire to

administer to clients. Clients were conveniently sampled.

Students acted as patients with acute upper respiratory tract infection, sore throat or throat discomfort to the healthcare prescribers at government health facilities in Zambia. On presentation, students asked for a medical prescription to enable them purchase antibiotics from a pharmacy.

The questionnaire that was adapted from the Zambia National Formulary [11] included the following variables on completion of the prescription (legibility, visit date, file number, patient's full name, address, age, gender), dose, dose frequency, duration of treatment, prescription signed and dated, prescriber's characteristics (name, identification number, address), prescription written on official paper and stamped.

Data file was exported to SPSS version 16.0 for analysis. Frequencies were run to describe the sample. The obtained information was transcribed on to a questionnaire and a prescription stored for analysis. Data was computerised using Microsoft Excel version 2007. Frequencies were run to check for out of range errors.

The study was approved by the Basic Science Department as part of teaching during school break. The study was explained to students who freely participated in the study. Students were informed that their none participation will not affect them in any way.

Results

A total of 80 (77.7%) students out of 103 participated in the survey of whom 54 (68.4%) were males. No information on gender was indicated for 1 participant. The median (Q1, Q3) age was 23 (Q1 = 21, Q3 = 28) years. No information on age was obtained from 2 participants. A total of 685 prescriptions were collected.

Table 1 Patient's details

Observations	Prescriptions		
	Yes n (%)	No n (%)	Total
Full name indicated	594 (87.1)	88 (12.9)	682
Address indicated	114 (16.7)	569 (83.3)	683
Age indicated	385 (56.5)	297 (43.5)	682

Over 10% of medical prescriptions did not include patient's name and a large proportion of prescriptions (83.3%) did not have patient's address. In addition, nearly half of prescriptions did not show patient's Most prescriptions were eligible indicating dosage,

Table 2 Prescriptions legibility and content

Observations	Prescriptions		Total
	Yes n (%)	No n (%)	
Legibility	656 (96.0)	27 (4.0)	683
Generic drug name	194 (28.5)	486 (71.5)	680
Drug dosage/dose indicated	673 (98.7)	9 (1.3)	682
Dose frequency indicated	667 (97.8)	15 (2.2)	682
Drug quantity specified	9 (1.3)	672 (98.7)	681
Treatment duration specified	662 (97.1)	20 (2.9)	682
Large blank space left	349 (51.2)	333 (48.8)	682

frequency and duration of treatment. However, only a small proportion of prescriptions (28.5%) had generic names prescribed. In addition, almost half of the prescriptions (51.2%) had large blank spaces left. A large proportion of prescriptions was signed (95.2%) and dated (97.2%). However, only a small proportion of prescription had prescriber's name (45.3%), identification number (26.8%) and address or department (28.3%) indicated.

Discussion

This study has demonstrated gross drug misuse as all the healthy medical and dental students who presented at healthcare facilities with complaints of acute upper respiratory tract infection (URTI) were given medical prescriptions. If the WHO six-step prescribing model had been applied by the prescribers, it would have been clear that there were no clinical signs to support a diagnosis of acute URTI. In addition, anti-microbial drugs are not recommended for acute URTIs, [12]. Therefore, all the prescriptions that were given in this study were inappropriately issued, clearly indicating drug over-prescription and drug misuse by healthcare professionals.

Only a small proportion of patient's prescription had address indicated (16.7%) and only (87.1%) had patient's name written on the prescription. This indicates that a significant proportion of medical prescriptions would not be traced to the affected patients. Medication errors [13] and adverse reactions [14] have been reported to be a growing concern in the UK. The findings from this study has revealed that patients' safety would not be assured in case of prescribing error, as significant proportion of patients would not be traced and advised appropriately.

Table 3 Prescribers' relevant details

Observations	Prescriptions		Total
	Yes n (%)	No n (%)	
Prescription signed	649 (95.2)	33 (4.8)	682
Prescription dated	659 (97.2)	19 (2.8)	678
Prescriber's name indicated	309 (45.3)	373 (54.7)	682
Prescriber's ID number indicated	183 (26.8)	499 (73.2)	682
Prescriber's department indicated	193 (28.3)	489 (71.7)	682

Only a small proportion of prescriptions (28.5%) had generic names indicated on the prescriptions. The implication is that large proportions of prescriptions have brand names making it a challenge to substitute drugs at pharmacy outlets.

A large proportion of prescriptions in this study did not have prescribers' names (54.7%), identification numbers (73.2%) and addresses or departments (71.7%). This observation may have many negative implications such as prescriptions being written by unqualified persons, identification of prescribers in case of drug errors, difficulty to targeted educational programmes to prescribers with prescribing challenges, even in case of medical errors resulting in medical-legal issues.

Being a non-random sample, the results may not be generalised to all clients. However, we have no reason to believe that clients who did not participate were any different from those who participated.

This study demonstrated over prescription and drug misuse. In addition, a number of gross prescribing pitfalls have been highlighted such as poor identification of both patients and prescribers. Furthermore, only a small proportion of prescriptions were written using generic names, making generic substitutions at pharmacy outlets a challenge. In addition, to develop prescriptions monitoring systems should be established to promote safe and rational use of medicines. Furthermore, more research on prescribing practices to be conducted in order to establish relevant gaps in this complex clinical task.

Author Contribution
CB conceived the study, participated in the data collection, analysis and interpretation of the results. SS participated in the analysis and analysis of the results. Both authors participated in drafting of the manuscript and agreed its submission for publication

References
1. Mucklow J, Bollington L, Maxwell S. Assessing prescribing competence. Br J Clin Pharmacol. 2012;74(4):632-9.
2. Ashcroft DM, Lewis PJ, Tully MP, Farragher TM, Taylor D, Wass V et al. Prevalence, Nature, Severity and Risk Factors for prescribing errors in hospital inpatients: prospective study in 20 UK hospitals. Drug Saf. 2015;38(9):833-43.
3. De Vries TPGM, Henning RH, Hogerzeil HV, Fresle DA. Guide to Good Prescribing: a practical manual. Geveva: World Health Organisation, Action Programme on Essential Drugs, 1994.
4. Maxwell SR. How should teaching of undergraduates in clinical pharmacology and therapeutics be delivered and assessed? Br J Clin Pharmacol. 2012;73(6):893-9.
5. Heaton A, Webb DJ, Maxwell SR. Undergraduate preparation for prescribing: the views of 2413 UK medical students and recent graduates. Br J Clin Pharmacol. 2008; 66:128-34.
6. Tobaiqy M, McLay J, Ross S. Foundation year 1 doctors and clinical pharmacology and therapeutics teaching. A retrospective view in light of experience. Br J Clin Pharmacol. 2007;64(3):363-72.

7. Wall D, Boshaw A, Carolan J. From undergraduate medical education to pre-registration house officer year: how prepared are students? Med Teach. 2006; 28(5):435-9.

8. Ross S, Loke Y. Do educational interventions improve prescribing by medical students and junior doctors? A systematic review. Br J Clin Pharmacol. 2009;67(6):662-70.

9. De Vries TP, Henning RH, Hogerzeil HV, Bapna JS, Bero L, Kafle KK et al. Impact of a short course in pharmacotherapy for undergraduate medical students: an international randomised controlled study. Lancet. 1995;346(8988):1454-7.

10. Ross S, Maxwell S. Prescribing and the core curriculum for tomorrow's doctors: BPS curriculum in clinical pharmacology and prescribing for medical students. Br J Clin Pharmacol. 2012;74(4):644-61.

11. Ministry of Health. Zambia National Formulary Committee (2013). Zambia National Formularly 2011-2013, 3rd Edition. Lusaka: Mininstry of Health; 2013.

12. Gonzales R, Steiner JF, Sande MA. Antibiotic prescribing for adults with colds upper respiratory tract infections and bronchitis by ambulatory care physicians. JAMA. 1997;278(11):901-4.

13. Dean B, Schachter M, Vincent C, Barber N. Causes of prescribing errors in hospital inpatients: a prospective study. Lancet. 2002;359:1373-8.

14. Pirmohamed M, James S, Meakin S, Green C, Scott AK, Walley TJ et al. Adverse drug reactions as cause of admission to hospital: prospective analysis of 18820 patients. BMJ. 2004;329:15-9