

Evaluation of Prescription Errors at Healthcare System in Khyber Pakhtunkhwa (KPK) Pakistan

Shahid Khattak¹, Taseer Ahmad^{*2}, Aftab-Ullah¹, Shaista Hussain², Faiza Naseer³, Farzana Zenab², Reem Altaf²

¹Faculty of Pharmacy, Gomal University Dera Ismail Khan, Pakistan.

²Shifa College of Pharmaceutical Sciences, Shifa Tameer-e-Millat University, Islamabad, Pakistan

³Bashir Institute of Health Sciences, Islamabad

Email: drtasir2011@gmail.com

Abstract – The main objective of the study was to identify the errors associated with prescriptions starting from prescribing through to drug administration and to measure the frequency of those errors. In this study, we reviewed a random sample of 150 prescriptions collected from different areas and organizations, (including private/government hospital settings as well as community settings) for possible errors. These prescriptions were collected and evaluated by a panel of expert reviewers. Errors were classified under three categories; prescriber's detail, patient's detail and prescription detail. The results depict that the most common (88%) prescription errors are due to the incorrect prescribing of dose in accordance to patient's weight. Omission of serial number/hospital number and quantity of the medicines to be dispensed, contributed 74.67% and 75.33 % respectively in the total percentage of medication error. In conclusion, incorrect prescribing, inadequate information given by the prescriber or the pharmacist and incorrect use of medicines by the patient can potentially cause suffering for patient, difficulty in achieving the therapeutic outcomes and expense to both patients and community.

Keywords – Prescriptions errors, Public/Private hospitals, evaluation studies, Pharmacist.

1. Introduction

The prescription is a written document that engages the medical and legal responsibility not only of the physician, but of all those subsequently involved in its execution. The error can be defined as "the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim". Dean et al. (2000) describes prescribing error as error which occurs as a result of a prescribing decision or in prescription writing process [1]. As a result, there is an unintentional significant reduction in the probability of treatment being timely and effective. The errors are classified into two main types: errors of omission (incomplete prescription) and errors of commission (incorrect information) [2, 3]. Prescribing errors may have various detrimental consequences. Medication prescribing deficiencies are the most common cause of actual and potential adverse drug events [4]. Studies carried out in US hospitals suggest that prescribing errors occur in 0.4–1.9% of all medication orders written and cause harm in about 1% of all inpatients [5].

Several researchers have collected data on the prescriptions of antibiotics and other drugs for identification of the prescribing errors, especially of the hospitalized patients [6]. A prospective cohort study was performed on the paediatric wards of two academic institutions. A total of 10,778 prescriptions were observed and medication errors were identified in 5.7% (616). Of these, 28% of errors were due to incorrect prescribing of anti-infective agents. A further retrospective study of medication errors demonstrated that the most widely

observed medication error was administration of wrong dose [7]. A study was conducted in 24 critical care units of U.K in 2004 collating 21,589 prescriptions. 3141 of the prescriptions had prescribing error and out of this 916 had shown seriously life threatening errors [8]. Jayawardane and his co-workers reported the prescribing errors in teaching hospitals. They observed 3,513 errors in 466,311 prescriptions, and 53.9% errors were due to incorrect dose of antibiotics [9].

The pharmacy profession is undergoing a paradigm shift from product-oriented to patient-oriented practice, termed as pharmaceutical care. It means the responsible provision of drug therapy for achieving definite outcomes that improve the quality of the patient's life [10]. Improved therapeutic outcomes include greater patient safety, better drug therapy and disease management, valuable health care expenditure, best adherence, and improved quality of life [11]. So, several, mainly observational studies describe and, to some extent, support the positive contribution of pharmacists in detecting and reducing the impact of drug related problems (DRPs) [12]. The current study has focused on identifying the medication errors associated with prescriptions from general practices, to measure the frequency of those errors and also to propose the ways to minimize such errors.

2. Methodology

A pilot study was conducted on 150 prescriptions, collected from different areas and organizations, including private/government hospital settings as well as community settings of Khyber Pakhtunkhwa (KPK) Pakistan. These prescriptions were collected and evaluated by a panel of

expert reviewers. The Panel consisted of hospital pharmacists, clinical pharmacists, clinical pharmacologists, retail pharmacists and physicians. The prescriptions were analyzed to detect and classify the medication errors, according to World Health Organization [13], parameters for prescription writing, British National Formulary (2010) and Drug information hand book criteria [14]. Depending on the requirements for prescriber's detail (Name, Address/telephone number/ department, Signature), patient's detail (Name, Address, Age, Gender, Weight, clinical record) and prescription detail (Serial number/ hospital number, Date, Name of the medicines, Strength, Dosage form, Dose, Total amount to be dispensed, Directions for use), three broad error categories were defined and then every prescription was evaluated for the presence of errors. The identified errors were placed under the specific error category and the error proportion (C) to each section of the study design was calculated by dividing the total number of prescriptions with error (A) by the total number of prescriptions reviewed (AB). This figure multiplied by 100 to give a value as a percentage.

$$C = \frac{A \times 100}{AB}$$

2.1. Data analysis

Finally, as a whole, the total extent of error was calculated for all the 150 prescriptions. The descriptive

statistical tools were used for analyzing the collected data.

3. Results and Discussion

In the present study, a total of 150 prescriptions were collected, analyzed and evaluated for the presence of errors. 132 (88%) prescriptions were missing the weight of the patients. The quantity of medicines to be dispensed and serial number or hospital number was not mentioned on 113 (75.33%) and 112 (74.67%) prescriptions respectively. Patient gender was missing in 94 and patient age in 65 prescriptions.

Aslam et al. 2012 have demonstrated that different types of error associated with prescription from general practice and lack of provision of pharmaceutical care services to the patients in Pakistan. The quantitative part of the study revealed that a great proportion of the prescription error is due to the incomplete information of patient's profiles and dose omission or wrong dose have contributed 88% of the total prescriptions.

Two studies in 2005 revealed that 19.4% prescriptions had no dose units and 54% prescriptions were with the wrong dose especially of the antibiotic class [15,16]. (Irshaid et al. 2005; Gandhi et al. 2005). Previously conducted research in 2008 had shown that 49.6% and 28.6% of the prescriptions had overdose and underdose errors, respectively [17]. Another study of 2011 had reported that 54.3% of prescriptions have not calculated doses according to the patient's weight and doses were not mentioned evidently in 35.1% of prescriptions [18].

Table 1: Data shows the type of error, number of prescriptions with the errors and error rate (as a percentage of total errors of 150 prescriptions)

Type of Prescribing Error	Number of prescription with the Errors	Error Rate
Prescriber's name not mentioned	21	0.14
Prescriber address/telephone number (in case of hospital not mentioned)	17	0.113
Prescriber's signature is absent	24	0.16
Patient's name is not mentioned	3	0.02
Patient's gender is not mentioned	94	0.627
Patient's age is not mentioned	65	0.433
Patient's weight is not mentioned	132	0.88
Clinical Record of the patient is not mentioned	24	0.16
Serial number or hospital number is not mentioned	112	0.747
Date of writing the prescription is not mentioned	8	0.053
Strength of medicines prescribed is not mentioned	41	0.273
Missing Dosage form of the medicines prescribed	19	0.126
The total amount of the medicines to be dispensed	113	0.753
Directions for the use of prescribed medicines	2	0.013

Concerning the strength of medications, it is one of the most important factor, especially when a drug is available in the market in various strengths. We found that in 41 out of 150 (27.33%) prescriptions, the strength of the medicines was not mentioned as shown in table 1. Such

error was also reported by Irshaid et al. (2005) and Vaishali et al. (2011) who stated that 52.8% and 26.8% of prescriptions were missing the strength of medications respectively.

Omission of gender and age of the patient also contributed to prescription errors. Our study investigated

that in 94 (62.67%) and 65 (43.33%) prescriptions gender and age were omitted as shown in table 01. Previous studies of Balbaid and Al-Dawood, (1998) identified that only 10 and 4.1% of prescriptions [19]. Irshaid et al. (2005) found that 22.7 and 48.7% of prescriptions and Vaishali et al. (2011) found that 11 and 10% of prescriptions omitted age and gender, respectively.

The lack of communication between hospital pharmacists and physicians in relation to drug information is also one of the reason of prescription errors [20]. It is further concluded that prescribing errors are one of the main reasons of preventable adverse drug events with nearly half resulting from prescribing errors.

The Pharmacists' role is often limited to the hospital pharmacy in the majority of public/private hospitals. They are mainly involved in drug procurement, purchasing and dispensing, because of which, they were unable to provide the main pharmaceutical care services to the patients. The insufficient number of pharmacists working in a pharmacy, their underutilization of medicines expertise and acceptance as the medicines experts are the main hurdles in the implementation of Good Pharmacy Practice in Pakistan [3]. A clinical and/or community pharmacist can contribute tremendously in avoidance of prescribing errors, irrational drug usage and various drug interactions to ensure appropriate and safe drug therapy.

4. Conclusion

Training and supervision in safe prescribing should be emphasized during medical undergraduate and postgraduate teaching to minimize related errors and transact the desired therapeutic goal. For improvement of medicine use and patient quality of life and maximally avoiding the medication errors, health authorities in Pakistan are needed to execute pharmaceutical care practice in the healthcare system of the country. One of the critical points of concern is the shortage of pharmacists in hospitals and too much focus on traditional duties rather than patient-orientated pharmaceutical care. Over the past few years in Pakistan the number of Pharmacists employed have been increasing but greater strides are needed to achieve a level of patient safety that would be deemed as acceptable from the Pharmacy profession.

References

- [1] B. Dean, N. Barber, M. Schachter, "What is a prescribing error?," *Quality in Health Care*, 2000, 9: 232-237.
- [2] S. A. Uema, E. M. Vega, P.D. Armando, D. Fontana, "Barriers to pharmaceutical care in Argentina", *Pharm World Sci*, 2008, 30: 211-215.
- [3] S. Azhar, M. A. Hassali, M. M. Ibrahim, M. Ahmad, I. Masood, A.A.Shafie, "The role of pharmacists in developing countries: the current scenario in Pakistan", *Human Resources for Health*, 2009, 7: 54.
- [4] B. Dean, N. Barber, M. Schachter, "What is a prescribing error?," *Quality in Health Care*, 2000, 9: 232-237.
- [5] L.O.T. Westerlund, B.R. Marklund, W.H.A. Handl, M. E.Thunberg, P. Allebeck, "Non-prescription drug-related problems and pharmacy interventions", *Ann Pharmacother*, 2001, 35: 1343-1349.
- [6] R. Kaushal, D.W. Bates, C. Landrigan, K.J. McKenna, M.D. Clapp, F. Federico and D. A.Goldmann, "Medication Errors and Adverse Drug Events in Pediatric Inpatients", *JAMA*, 2001, 285(16), 2114-2120.
- [7] S.D.Phillips, B.J. Burns, E.R. Edgar, K.T. Mueser, K.W. Linkins, R. A. Rosenheck, R. E. Drake, E.C. McDonel Herr, "Moving. Assertive Community Treatment In Standard Practice", *Psychiatric Services*, 2001, 52:771-779.
- [8] S. A. Ridley, S.A. Booth, C.M. Thompson, "Prescription errors in UK critical care units", *Anaesthesia*, 2004, 59:1193-1200.
- [9] S. J. Jayawardena, S. Eisdorfer, S. A. Indulkar, D. Pal, Sooriabalan, R. Cucco, "Prescription errors and the impact of computerized prescription order entry system in a community-based hospital", *Am J Ther*, 2007,14:336-40.
- [10] A. Awad, S. Al-Ebrahim, E. Abahussain, "Pharmaceutical care services in hospitals of Kuwait", *JPPS*, 2006., 9, 149-157.
- [11] S. Azhar, M. A. Hassali, M. M. Ibrahim, "Perceptions of hospital pharmacist's role in Pakistan's healthcare system: a cross-sectional survey", *Trop J Pharm Res*, 2011, 10: 11-17.
- [12] A. T.Montgomery, S. Källemark-Sporrong, M. Henning, M.P. Tully, A. Kettis-Lindblad, "Implementation of a pharmaceutical care service: prescriptionists', pharmacists' and doctors' views", *Pharm World Sci*, 2007, 29: 593-602.
- [13] De Vries, R. H. Henning, H. V. Hogerzeil, "Guide to Good Prescribing. A Practical Manual. Geneva, World Health Organization Action Programme on Essential Drugs", *Saudi Pharmaceu J*, 2014,22:522-527.
- [14] M. S. Lacy, M. Hayman, K. Gertz, A. Short, S. Dispenzieri, "Pomalidomide (CC4047) plus low dose dexamethasone (Pom/dex) is active and well tolerated in lenalidomide refractory multiple myeloma (MM) Leukemia", 2010, 24:1934-1939.
- [15] Y. M. Irshaid, M. Al Homrany, A. A. Hamdi, K. K. Adjepon-Yamoah, A.A. Mahfouz, "Compliance with good practice in prescription writing at outpatient clinics in Saudia Arabia", *East Mediterr. Health J*, 2005, 11:922-928.
- [16] T. K. Gandhi, S. N. Weingart, A.C. Seger, J. Borus, E. Burdick, E. G.Poon, L. L. Leape, D. W. Bates, "Outpatient Prescribing Errors and the Impact of Computerized Prescribing", *J. Gen. Int. Med*, 2005, 20:837- 841.
- [17] L. A. Costa, C. Valli, A. P. Alvarenga, "Medication dispensing errors at public pediatric hospital. *Rev Latino-am Enfermagem*., 2008, 16:812-817.
- [18] D. P. Vaishali, B. P. Deepak, M.M. Syed, M. Aarif, S. Saudamini, K.Piyush, "Prescription writing practices in a rural tertiary care hospital in Western Maharashtra", *India. Austr. Med. J*, 2011, 4: 4-8.
- [19] O. M. Balbaid and K. M. Al-Dawood, "Assessment of physician's prescribing practices at Ministry of Health Hospitals in Jeddah City", *Saudi Arabia.Saudi Med. J*, 1998, 19: 28-35.
- [20] G. Murtaza, R. Kousar, S. Azhar, S.A. Khan, Q. Mahmood, "What Do the Hospital Pharmacists Think about the Quality of Pharmaceutical Care Services in a Pakistani Province? A Mixed Methodology Study", *BioMed Research International*, 2015, 2; 6.