ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 8, Issue, 10, pp.39890-39892, October, 2016

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

IDENTIFICATION OF ERRORS IN PRESCRIPTION WRITING AND DRUG – DRUG INTERACTIONS IN GIVEN PRESCRIPTIONS IN TRAINING OF UNDER GRADUATE MEDICAL AND DENTAL STUDENTS

***Dr. Samia Perwaiz Khan, Dr. Muslim Abbas, Dr. FarahJaved and Dr. Fatima Rizvi**

Department of Pharmacology, Jinnah Medical & Dental College, Karachi

ARTICLE INFO

Article History:
Received 20th July, 2016
Received in revised form
22nd August, 2016
Accepted 08th September, 2016
Published online 30th October, 2016

Key words:

Errors in prescription,
DDI-Drug-drug interaction,
Pharmacokinetic,
Pharmacodynamics,
ADR- Adverse drug reactions.

ABSTRACT

Background: This study was carried out to determine the significance of training undergraduate medical and dental students in prescription writing and to identify the errors in prescription writing and types of drug-drug interactions in a prescription to allow safety of the patients and prevent adverse drug reactions.

Methodology: The study was conducted in Pharmacology Department, Jinnah Medical and Dental College, Karachi. The participants include 70 MBBS undergraduate students and 50 BDS undergraduate students. In the given prescriptions the students were made to identify errors and drug-drug interaction in given prescriptions pre and post demonstration assessment was done.

They were given the task to identify errors (Score 0-8) and drug - drug interactions (Score 0-20) in the given prescriptions and responders and non-responders were marked (pre and post demonstration). Demonstration was given to students regarding errors in prescription writing and drug- drug interactions and again number of prescriptions were shown to them. Scores were recorded and statistical analysis was done by applying paired students t - test.

Conclusion: This study emphasizes the need for medical educator to properly train the juniors (under graduate Medical and Dental College students) to avoid the errors in prescription and drug – drug interactions while writing prescriptions for patients safety and to avoid adverse drug reactions.

Citation: Dr. Samia Perwaiz Khan, Dr. Muslim Abbas, Dr. FarahJaved and Dr. Fatima Rizvi, 2016. "Identification of errors in prescription writing and drug – drug interactions in given prescriptions in training of under graduate medical and dental students", *International Journal of Current Research*, 8, (10), 39890-39892.

INTRODUCTION

Identification of errors in prescriptions writing such as name of drug, dosage, strength, route of administration are important from patient safety and care (Giampaolo *et al*., 2009). Medication errors are common in general practice and in hospitals. Both errors in the act of writing (prescription errors) and prescribing faults acan result in harm to patients. Missing information or mistakes are sources of errors, as in unintended omissions in the transcription of drugs. Inappropriate dosage, omitted transcription, and poor handwriting are common. Inadequate knowledge or competence and incomplete information about clinical characteristics and previous treatment of individual patients can result in prescribing faults, including the use of inappropriate medications. Lack of communication among health-care staff, particularly between doctors/Dentistsand nurses have been identified as important underlying factors that contribute to prescription errors and faults (KuanMun Ni *et al*., 2002; Rupp, 1991). Mistakes in prescribing most often occur, because of deficient knowledge or insufficient training. Junior doctors often work in stressful circumstances that are perceived as routine by experienced doctors. Errors are more frequently made by junior staff due to inadequate knowledge or training often underlie inappropriate prescribing and other faults (Lesar, 1992; Dean *et al*., 2002). Errors in prescribing may be classified into two main types, Errors of omission and errors of commission. Errors of omission are defined as prescriptions with essential information missing while errors of commission involve wrongly written information in the prescriptions (Lesar, 1992). Errors of omission include absence or incomplete specification of dosage form or strength, dose or dosage regimen, quantity or duration of drug to be given as well as prescriptions that are illegible. Whereas, errors of commission include wrong or missing dose or dosage regimen, wrong drug indication, wrong quantity or duration of therapy, incorrect or missing patient's name and information on the prescription (Dean *et al*., 2002; Jeffrey K Aronson, 2004; Palleria *et al*., 2013)

Corresponding author: Dr. Samia Perwaiz Khan,
Department of Pharmacology, Jinnah Medical & Dental College, Karachi.

DDI can be classified into two main groups

- Pharmacokinetic drug interactions: Include absorption, distribution, metabolism and excretion, all of them

being associated with both treatment failure or toxicity. (Palleria *et al*., 2013; Yi-Ting Zhou *et al*., 2014)

- Pharmacodynamics drug interactions: include direct effect at receptor function interference with a biological or physiological control process and additive/opposed pharmacological effect.

Drug-drug interactions (DDIs) are one of the commonest causes of ADRs (Yeh *et al*., 2009) and have been reported that these manifestations are commons in the elderly due to poly-therapy (Lee *et al*., 2000) In general, poly-therapy make therapeutic management more complex and increases the risk of clinically relevant drug interactions, which can induce the development of ADRs, and both reduce (Bordet *et al*., 2001) or increase the clinical efficacy. (Gallelli *et al*., 2002; Gallelli *et al*., 2003) Poly-therapy in elderly maycause drug-drug interactionsspecially if misunderstood and new potentially unnecessary drugs are administered; therefore the patient is at risk to develop further ADRs. (Gallelli *et al*., 2003) The aim of this study was to find out the benefit of training undergraduate medical and dental students regards identifying errors and drug –drug interaction in prescription writing.

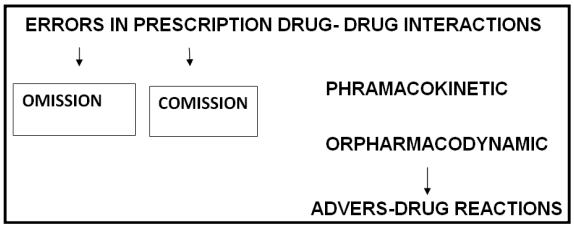

Figure 1. Errors in prescription writing & Drug-drug interactions

METHODOLOGY

The study was conducted in Pharmacology Department, Jinnah Medical and Dental College. The participants include 70 students of MBBS and 50 students of BDS. The study was conducted from July- September 2016. Students who were absent in the training sessions were excluded from the study. The students were given a set of prescription in each session and were given the task to identify errors and drug –drug interactions. Ingivenprescriptions they were asked to identify the errors and drug- drug interaction in givensample prescriptions. Score was done (0-8). The response about drug-drug interactions in these prescriptions was recorded and responders and non-responders were marked as score(0-20). Than Demonstration was given to students regarding the identification of errors in prescription writing and drug -drug interactions and again number of prescriptions were shown to them.

Statistical Analysis

Data was entered SPSS version 21. Paired t test was applied to compare the scores of students before and after demonstration for identification of errors in prescriptions and drug-drug interactions. P-value less than 0.05 was considered statistically significant.

RESULTS

Study was performed by given to MBBS and BDS prescriptions to recognize errors of prescription and drug-drug interactions.

Students Group	Before Demonstration Score(0-8) Mean	After Demonstration Score (0-8) Mean	p-value
MBBS N= 68	3.15	6.13	0.00
BDS N= 25	3.60	7.24	0.00

Table 1. Identification of Errors in Prescription Writing

Paired Samples Statistics- MBBS		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before	3.15	68	1.781	.216
	After	6.13	68	2.232	.271

Table 2. Identification of Drug-Drug interactions in prescription writing

Students Group	Before Demonstration Score(0-20)Mean	After Demonstration Score(0-20) Mean	p-value
MBBS N= 63	2.98	13.9	0.00
BDS N= 26	2.73	13.23	0.00

Paired Samples Statistics-MBBS		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pre	2.98	63	1.529	.193
	post	13.87	63	3.709	.467

Paired Samples Statistics-BDS		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pre	2.73	26	1.041	.204
	post	13.23	26	3.777	.741

Table 2 shows the significance of training in prescription writing and identification of drug-drug interactions. Demonstrations and training in both medical and dental undergraduate students. P value was statistically significant.

DISCUSSION

This study shows that there was considerable improvement in identification of errors in prescription writing and drug-drug interaction in undergraduate Medical and Dental students, after proper training. The faults and errors in prescription writing (Giampaolo P. Velo and Pietro Minuz, 2009; KuanMun Ni *et al*., 2002; Rupp *et al*., 1991; Lesar *et al*., 1992; Dean *et al*., 2002) can be majorrisk topatientssafety. They occur both ingeneral practice and in hospital, they could affect quality ofhealthcare, affect patientssafety may cause ADR that could be fatal. Active training in prescription writing to avoid or reduce the risk of errors and faults in prescriptions is strongly recommended. These should be focused on the education and training of prescribers (Medical and Dental graduates) and the use of on-line aids. The prescribing procedure should be standardized and use uniform prescribing chartsin order to avoid transcription and omission errors.Feedback control systems and immediate review of prescriptions, which can be

performed with the assistance of a hospital pharmacist, are also helpful (Jeffrey K Aronson, 2004). Drug-drug interactions are one of the commonest causes of adverse drug reaction in developed countries, particularly in the elderly due to poly-therapy, with a prevalence of 20-40%. In particular, poly-therapy increases the complexity of therapeutic management and thereby the risk of clinically important drug interactions, which can both induce the development of adverse drug reactions or reduce the clinical efficacy. DDIs can be classify into two main groups: pharmacokinetic and pharmacodynamics. DDIs focusing the interest on their clinical implications (Palleria *et al*., 2013; Yi-Ting Zhou *et al*., 2014; Yeh *et al*., 2009) New technological and recent advances, including automated parallel measurements of bacterial growth, make it possible to identify accurate type of interactions between drugs, leading to a better understanding of the function of agent. There can synergistic and antagonistic interactions (Lee *et al*., 2000; Bordet *et al*., 2001; Gallelli *et al*., 2002). Study of antagonistic drug combinations could be effective as multidrug treatments. The choice between synergy and antagonism may involve a substitution between immediate efficacy of inhibition of microbial growth and in future development of resistance (Bollenbach, 2015; Lee *et al*., 2000). Pharmacovigilance identify and quantify the risks associated with the use of drugs, thus contributing to better understand the most important characteristics of adverse drug reactions (ADRs) and the pathogenic mechanisms involved. (Moore *et al*., 1985) ADRs represent a common clinical problem and can be responsible for an increased number and duration of hospitalizationsof patients. Clinical trials have raised concerns about possible DDIs between PPIs and an antiplatelet drug, clopidogrel. PPIs with a dual antiplatelet therapy consisting of clopidogrel and aspirin may attenuate the anti-aggregation effects of those medications and increase the risk of cardiovascular ischemia. Further studies are urgently required to clarify the mechanism of this DDI and to explore new aspects of the DDI potential of PPIs (Ogawa, 2010). Thus this the accurateprescription writing to avoid errors and up to date knowledge of DDI is most necessary for patient safety.

Conclusion

Active interventions by training undergraduate Medical and Dental students is aimed at reducing prescription errors and prescribing faults are strongly recommended. These should befocused on the education and training of prescribers. Feedback control systems and immediate review of prescriptions by hospital pharmacists are very helpful.

Acknowledgment

Jinnah Medical andDental College chairman and principal for their approval to conduct study. Faculty of Pharmacology for conducting the training sessions and students for their participation.

REFERENCES

Bollenbach T. Antimicrobial interactions: mechanisms and implications for drug discovery and resistance evolution. Current Opinion in Microbiology 2015,27:1–9.

Bordet R, Gautier S, Le Louet H, Dupuis B, Caron J. Analysis of the direct cost of adverse drug reactions in hospitalised patients. Eur J Clin. Pharmacol. 2001;56:935–41.

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

Gallelli L, Colosimo M, Pirritano D, Ferraro M, De Fazio S, Marigliano NM, *et al*. Retrospective evaluation of adverse drug reactions induced by nonsteroidal anti-inflammatory drugs. Clin Drug Investig. 2007;27:115–22.

Gallelli L, Ferreri G, Colosimo M, Pirritano D, Flocco MA, Pelaia G, *et al*. Retrospective analysis of adverse drug reactions to bronchodilators observed in two pulmonary divisions of Catanzaro, Italy. Pharmacol Res. 2003;47:493–9.

Gallelli L, Ferreri G, Colosimo M, Pirritano D, Guadagnino L, Pelaia G, *et al*. Adverse drug reactions to antibiotics observed in two pulmonology divisions of catanzaro, Italy: A six-year retrospective study. Pharmacol Res. 2002;46:395–400.

Giampaolo P. Velo& Pietro Minuz. Medication errors: prescribing faults and prescription errors.Br J ClinPharmacol. 2009 Jun; 67(6): 624–628.

Jeffrey K Aronson.Medication errors resulting from the confusion of drug names, Expert Opinion on Drug Safety 2004 3:3, 167-172, DOI: 10.1517/14740338.3.3.16

KuanMun Ni, Chua Siew Siang, Mohamed Noor bin Ramli. Noncompliance with Prescription Writing Requirements and Prescribing Errors in an Outpatient Department. *Malaysian Journal of Pharmacy 2002;1(2):45-50*

Lee CE, Zembower TR, Fotis MA, Postelnick MJ, Greenberger PA, Peterson LR, *et al*. The incidence of antimicrobial allergies in hospitalized patients: Implications regarding prescribing patterns and emerging bacterial resistance. Arch Intern Med. 2000;160:2819–22.

Lee CE, Zembower TR, Fotis MA, Postelnick MJ, Greenberger PA, Peterson LR, *et al*. The incidence of antimicrobial allergies in hospitalized patients: Implications regarding prescribing patterns and emerging bacterial resistance. Arch Intern Med. 2000;160:2819–22.

Lesar TS. Common prescribing errors. *Ann Intern Med* 1992; 117(6): 537-538.

Moore N, Biour M, Paux G, Loupi E, Begaud B, Boismare F, *et al*. Adverse drug reaction monitoring: Doing it the French way. Lancet. 1985;2:1056–8.

Ogawa R[1], Echizen HDrug-drug interaction profiles of proton pump inhibitors.ClinPharmacokinet. 2010 Aug;49(8):509-33. doi: 10.2165/11531320-000000000-00000.

Palleria C, Di Paolo A, Giofrè C, Caglioti C, Leuzzi G, Siniscalchi A, De Sarro G, Gallelli L. Pharmacokinetic drug-drug interaction and their implication in clinical management. J Res Med Sci. 2013 Jul;18 (7):601-10.

Rupp MT. Screening for prescribing errors. Am Pharm 1991; NS31: 71-78.

Yeh, P. J., M. J. Hegreness, A. P. Aiden, and R. Kishony. Drug interactions and the evolution of antibiotic resistance. Nat. Rev. Microbiol.2009, 7:460-466.

Yi-Ting Zhou, Lu-Shan Yu, Su Zeng, Yu-Wen Huang, Hui-Min Xu, and Quan Zhou·Pharmacokinetic drug–drug interactions between 1,4-dihydropyridine calcium channel blockers and statins: factors determining interaction strength and relevant clinical risk management. Therapeutics and Clinical Risk Management.

****