ORIGINAL ARTICLE
REVIEW OF PRESCRIBER APPROACH TOWARDS RATIONAL DRUG PRACTICE IN HOSPITALISED PATIENTS

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Background: The rational drug prescribing practice is an important health concern around the globe that not only interferes patient's life but also the socioeconomic issues. **Objective:** The aim of current study was to evaluate the rational use of drug, prescribing behaviour of consultant physicians, role of medical team members in irrational therapy and form the basis for providing necessary information to the policy makers. **Methods:** This cross-sectional study was conducted involving a set of 340 medication orders containing about 1,755 medications prescribed to patients in DHQ Teaching Hospital DI Khan, Pakistan from March to July 2009. The WHO operational package for monitoring and assessing country pharmaceutical situations indicators were used for data collection. **Results:** Among drugs prescribed per average encounter, 75% were dispensed from hospital pharmacy. Generally about 22.3% encounters of overdosing, 16.16% drug duplication, 24.25% drug-drug interactions, 3.5% adverse drug effects and 3.8% cases of contraindications were recorded. The proportion of consultations with antibiotics and injectables prescribed was 80% and 57% respectively. Likewise not less than 70% patients were prescribed NSAIDS, 67% steroids, 55% vitamin supplements, and 34% oral re-hydration solutions. Minimum 5 drugs per prescription were recorded and 70% of prescriptions were reported with high cost of therapy. **Conclusion:** The drug practice among hospitalised patients was clearly irrational accompanied by high levels of medication error. An accurate prescribing decision, appropriate treatment, and rational use of drugs are major needs of the day to ensure safe medication practice.
Keywords: Rational drug use, adverse drug effects, generic drugs, medication profile

INTRODUCTION

Rational drug use is well recognised as important part of health management systems having unavoidable effect on patient health and socioeconomic features. Many studies have done to document the drug use pattern, and indicates that over prescribing, multi-drug prescribing, misuse of drugs, use of unnecessary expensive drugs, and overuse of antibiotics and injections are most common problems of irrational drug use by prescribers as well as consumers.[1]

The concept of rational use of drug is new in developing countries, though several steps have been taken in the recent past towards ensuring rational drug use. Among the various measures, the development and revision of national essential drug list, development of national formulary, amending pharmacy act and opening drug information centres are vital.[2] On one side the members of the healthcare team (Physician, nurse, pharmacist) are needed to practice rational drug therapy in order to ensure patient safety[3] but cannot be implemented without prior patient knowledge regarding medication and their use[4].

Currently, accurate prescribing decisions, appropriate treatment, and Rational Use of Drugs (RUD) are major concerns among healthcare services. The results obtained after auditing prescriptions indicate that majority of the prescribers do not adhere to the ideal pattern of the prescription writing[5] and these prescriptions are not explicit in their contents.

Replacement of *Rx* sign with the word 'Advice' in large number of prescriptions is indicative of changing pattern of the prescriptions. Over-prescribing indicates the increasing tendency of poly-pharmacy. Overuse of antibiotics and injections is also commonly observed.[6] The trend of the polypharmacy may be due to the patient's expectations and demand of quick relief, the incorrect diagnosis, and the influence of the lucrative promotional programmes of the drug companies. More than 50% of the inappropriate therapy shows that prescribers are not up to date with the progress in medical field and should be more responsible.[7] The pharmacist is often the last member of the health care team to see the patient before he/she takes the drug and has an immense responsibility in counselling the patients.[8]

This study aimed to evaluate the rational drug practice by the doctor, determine the role of medical team members and suggest strategies to lessen burden of this serious health issue.

MATERIAL AND METHODS

The study was designed to collect patient medication data from March to July 2009 in nursery, paediatrics, surgical, medical, and orthopaedic wards at a tertiary care hospital in DI Khan involving a set of 340 medication orders containing about 1,755 medications prescribed to patients. The pharmacists were trained on

matters pertaining to data collection, data evaluation and analysis.

Patient medication details were recorded on specially designed proforma consisting of demographic details, medical history, investigations, diagnosis, medication, drug interaction, diet etc. All age group were included in the study starting from a few hours to 70 yrs. Medication profiles of all patients staying at least 3 days in hospital were included in the study. Any miswritten, ineligible, incomplete, overwritten medication profiles were excluded. Rational drug was defined as medical therapeutic view accepted at WHO conference of 1985 in Nairobi.[9]

The contents of medication records were assessed by team comprising of chief pharmacist, a paediatrician, a medical specialist, and a chief nurse using online software programmes for drug interactions, over dosing, adverse dug effects etc. The types of errors were categorised into groups that best represented the data. If a single drug episode was judged to be an error for multiple reasons, it was counted only once for the error rate analysis.

RESULTS

A total of 513 patient medication charts were assessed, among those 173 were rejected on various basis, and 340 prescriptions were evaluated involving 1,750 medications on average. Seventy-seven percent of patients were male and 33% were female. Age ranges are presented in Table-1.

Among drugs prescribed per encounter, 75% were dispensed from hospital pharmacy, of which 100% were adequately labelled, and 87% were on the national essential drug (ED) list. Only 13% were prescribed by generic name (Table-1).

There were 22.3% encounters of overdosing, 16.16 drug duplication, 24.25% drug interactions, 3.5% adverse drug effects, and 3.8% cases of contraindications. About 70% drugs were costly and were considered as a burden on patients, as cheaper alternatives are available.

About 5 drugs per prescription were recorded. Fifty-five percent of patients knew how to take the drugs they received, 80% of them received antibiotics. Ninety percent of prescriptions with antibiotic therapy contained at least 2 antibiotics. Third generation antibiotics were reported as drugs of choice and 57% of drugs were administered as injectables. Seventy percent patients were prescribed NSAIDS, 67% steroids, 85% vitamin supplements, and 34% oral re-hydration solutions etc. (Table-2).

Fifty percent physicians were using irrational drug prescription followed by trainee doctors (27%). Administration errors were seen in 18%, and dispensing errors in 5%.

Table-1: Medication errors reporting parameters

Variable	Percent
Clinical data (Before Trial Patient Data)	
Male	77
Female	23
A few hours to 10 years	37
11–20 years	13
21–30 years	20
31–40 years	9
41–50 years	9
51–60 years	8
61–70 years	4
Patient prescription evaluation data	
Over dosing	22
Drug duplication	16
Drug interactions	24
Adverse drug effects	50
Contraindications	13
High cost of therapy	70
More than 1 antibiotic	90
3rd Generation	80
IV/IM	57
Drugs per prescription	5
Dispensed from hospital	75
Adequate labelling	100
Drugs in National Essential Drug List	87
Drugs prescribed by generic name	13
Patients having knowledge about drug use	55

Table-2: Therapeutic classification of drug use

Therapeutic Class	Percentage
Antibiotics	80
NSAIDS	70
Steroids	67
Vitamin Supplements	55
Oral re-hydration solutions	37
Cardiovascular, renal, blood	4.5
Antihistamines	8
Gastrointestinal system	17
Respiratory system	11
Anti diabetics	15
Autonomic nervous system	11.2
Anti-parasites	3

DISCUSSION

The issue of rational drug use is somewhat new in developing countries where the dispensing practices, nurse care and drug dispensing are affected by multiple of factors. Poverty and less drug usage knowledge are also contributing factors. Although patterns of dispensing practices has been extensively studied in the developing countries yet no published overview exists of the impact of interventions to change the drug use practice in developing countries.[1]

Minimum drugs per prescription recorded were 5 which not only exceeds the WHO limits of 2 drugs per prescription[10] but also much higher than Nepal (2.91)[11], Brazil (8.6)[11], and India (3.2)[12]. This simply show physicians' trend towards the poly-pharmacy which is an important factor for hospitalisation.[13] Poly-pharmacy leads to elevated levels of drug related problems (drug interactions, adverse drug effects, non-compliance, overdosing etc.) all over

the world. Medication errors prevalence results of current study support this fact.

Errors are frequent in medical practice as a result of its human nature and of the complexity of medical management. In modern medicine, errors are still frequent and are the most common cause of iatrogenic adverse events.[14] Drug dose and adverse effects are strongly interconnected with each other. Drug dosing errors are the most common type of prescription errors observed up to 15%[15] accounting for 56% of all preventable adverse drug events (ADE)[16]. Same is being populated in our study reporting 22% of dosage errors accounting for 50% of preventable reported adverse effects. There are variable ADE percentages reported.[17] This variability is due to local socioeconomic, educational, and cultural factors related to prescribers as well as consumer. Moreover this study shows high occurrence rates of drug duplication, and drug interactions which are not different from that observed in other parts of world especially the developing countries.[17] Above mentioned factors prevalence rates are relatively high.[18] Accounting to a major portion of drug related problems, this may lead to increased cost of therapy, risk to patients' health and greater chances of hospitalisation.

The world physician trends aim at generics 48.4–68%[19] despite the advantages of generic prescription. However, only 13% generic drug prescription was noted in current study. Somewhat similar trend is being observed in the region.[2] This trend not only reflects the impact of pharmaceutical manufacturers on prescription patterns but increases the cost of therapy. The same is observed in our study where 70% of drugs were costly for patients. This trend is very high as compared to other countries[2] high cost may lead to non-adherence to the therapy.[12,15]

Most commonly prescribed therapeutic class of drugs observed in the current study was antibiotics (80%) followed by NSAIDS (70%) and steroids (67%). Antibiotic prescription is remarkably higher than reported in Iran (61.9%),[20] England (60.7%)[21], and Norway (48%)[22]. It has been observed that more than one antibiotic prescription was a common practice using mostly third generation antibiotics. Overuse of antibiotics is the principal factor in the emergence of resistant strains of bacterial pathogens. Second most commonly used therapeutic class was NSAID (70%). The excessive use of NSAIDS is also reported in other countries as well.[23] There are reports of prescribing more than one NSAIDS at a time[24], as also observed in this study. Apparently this is not a good prescription pattern as reported elsewhere. Similarly the proportion of using contraindicated drug specially in NSAIDS therapeutic class drugs (e.g., aspirin in peptic ulcer patients) observed was 13% which is significantly low as compared to other countries (47–89%).[25] Such risk

bearing effort is never allowed except in a few cases with recessive need (acceptable if there is a very strong indication, and if the drug is prescribed in combination with gastro-protective drugs (e.g., secondary prevention of myocardial infarction with aspirin). Reasons for prescribing NSAIDs could be that physicians did not assess contraindications for use of NSAIDs because they lacked knowledge of the relevant risks, underestimated the importance of these risks, or simply forgot to assess these risks.[26]

Injections have long had a connotation as particularly powerful and fast acting medicine. Already 25 years ago so-called injection doctors existed[26] and still today injection are widely overused by prescribers and consumers.[27] Nearly similar pattern is observed in our study. Somewhat quick mode of action makes it popular among prescribers and consumers. This may lead to irrationality of drug as well.

In developing countries objective information on drug is limited. Health workers have very little training on matters of drugs and their safe usage.[28] As indicated in current study, the physicians' contribution in irrational drug use is 50% followed by trainee doctors, nursing staff and pharmacy. Prescribing and dispensing patterns are affected by socio-cultural, economic factors, patient demands, prescribers attitude to risk, drug promotions, previous experience etc. Misleading promotion of pharmaceutical companies and salesman pressure, and work load etc. are key factors in irrational drug prescription, administration, and dispensing.[29]

CONCLUSION

Drug practice in the tertiary care hospital was mainly irrational and was potentially exposing the life of patients to a continuous threat during treatment period. This study suggests a greater need for improvement in prescribing and dispensing practices by physicians and health team members.

RECOMMENDATIONS

Continuing medical education and strengthening of cooperation between medical staff and pharmacists are needed. Moreover, common man needs to be provided awareness on matters pertaining to drug usage. Reducing the interactions with medical representatives may help in reducing irrational prescriptions and tend physicians toward generics. The Pharmacy and Therapeutics Committee of the hospital should take the leading role in rationalising the prescribing and dispensing pattern in the hospital. Pharmacists could be routinely involved in ensuring accurate medication histories at the time of admission, with particular attention to high-risk groups (e.g., patients with cognitive impairment using multiple medications).

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