

EVALUATION OF DRUG-PRESCRIBING PATTERNS AT OUTPATIENT CLINICS OF PUBLIC HEALTH FACILITIES IN MIRPUR AZAD KASHMIR

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ABSTRACT

Objective: To evaluate prescribing practices in public health facilities of district Mirpur, Kashmir where no previous evidence regarding drug-prescribing behaviours was available.

Study Design: Cross-sectional study.

Place and Duration of Study: Department of Pharmacology and Therapeutics, Army Medical College, Rawalpindi and outpatient departments of public health facilities in district Mirpur, Kashmir, from Aug to Oct 2020.

Methodology: The prescribing pattern analysis was done by objective observations of prescriptions after patient-physician encounter. World health organization defined core and complementary prescribing indicators were evaluated for all the prescriptions.

Results: Among the core prescribing indicator, average number of medicines per prescription were 3.11 (World Health Organization's standard, 1.6-1.8). Only 2% and 67% of medicines were generic and essential medicines respectively (standard, 100%). Almost half the prescriptions contained antibiotics (standard, 20-26.8%) whereas 8% had injections (standard, 13.4-24.1%). Among the complementary indicators there was no prescription without medicines and average prescription cost was 479 Pakistani Rupees.

Conclusion: This is the first study to give a snapshot of prescribing behaviours in public health facilities in Kashmir. All the prescribing indicators except injectables were below the standards. A multi-disciplinary approach involving authorities, industry and professionals is required to promote rational prescribing.

Keywords: Drugs, Pakistan, Polypharmacy, Prescriptions standards, World health organization.

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INTRODUCTION

Irrational use of drugs is a major health problem concerning particularly low- and middle-income countries leading to negative outcomes in patients including various drug-related problems, such as polypharmacy, adverse drug events, more demands on drug monitoring, and unwanted increase in treatment cost^{1,2}. Irrational prescribing practices may include non-adherence to the use of essential medicines for common conditions, polypharmacy, use of medicines that are irrelevant to the diagnosis, inappropriate use of antibiotics, and limited use of medicines by their generic names³⁻⁵.

The World Health Organization (WHO) held a conference in Nairobi in 1985 on rational use of drugs. As a result of it, parameters were developed in three general areas to improve the rational use of drugs worldwide including prescribing indicators, patient care indicators, and healthcare facility specific indicators⁶.

A major bulk of research pertaining to rational drug use both locally in Pakistan and globally has been

carried out in relation to prescribing behaviours^{7,8}. However, there are few studies on dispensing and community pharmacy but very little research has been carried out on the aspect of drug pricing and regulation policies and customer related elements^{9,10}.

There is lack of evidence regarding drug-prescribing behaviours in Kashmir region of Pakistan. The main objective of the study was to evaluate prescribing practices in public health facilities of district Mirpur, Kashmir, Pakistan. This study will serve as baseline to assess the needed strategies that will promote the rational use of medicine in Kashmir.

METHODOLOGY

The was cross-sectional study from August to October 2020. Data was collected from 10 different public health facilities in District Mirpur, Kashmir including a district headquarters (DHQ) hospital, a tehsil headquarters (THQ) hospital, 3 rural health centres (RHC) and 5 basic health units (BHU) keeping appropriate representation from urban, semi urban and rural facilities. The selection of health care facilities such as RHC and BHU was carried out after discussion and approval by the local health administration considering convenience, accessibility and other logistic

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Received: 03 Feb 2021; revised received: 27 May 2021; accepted: 27 May 2021

aspects. As per the WHO protocol minimum of 600 prescriptions or more should be covered in any study investigating the prescribing patterns in healthcare facilities¹¹.

Ethical approval was obtained from ethical review committee Army Medical College (ERC/ID/89). In addition, the permission to collect data from the health facilities was obtained from the district health officer. Consent was obtained verbally from each study participant before objective observation of prescriptions. The data was coded and then entered to keep identities of patients and prescribers confidential.

The reference population included all patients who visited the outpatient clinics at these facilities during the study time period and were included using non-probability convenient sampling technique. Anti-leprosy, anti-tuberculosis, antifungal, anti-amoebic, anti-giardiasis, anti-leishmaniasis, anti-trypanosomal and antimalarial drugs were not considered among antibiotics. Prescriptions of patients undergoing any surgical procedure and antenatal prescriptions were not included. A total number of 800 encounters were found to meet the inclusion criteria, thus were included in the study analysis. Data were collected immediately after patient-physician and patient-dispenser encounters through objective observations made by the investigator of the prescriptions carried by the patients attending the health facility on that day. The required indicators were recorded in the prescribing indicator and detailed indicators encounter forms devised by the WHO. The prescribing indicators recorded included mean number of drugs per prescription to determine polypharmacy; percentage of drugs prescribed with generic names and from essential medicines list (EML) to determine the extent to which prescribing behaviours are complied to a national drug policy as designated in the national medicine list of Pakistan; percen-

tage of prescription-encounters with antibiotics and injections calculated to determine the overall use of commonly overused and costly forms of medicine therapy. INN (International non-proprietary names) prescribing was referred to as generic prescribing in the present study to analyse the prescription patterns in this regard. INN prescribing is not only statutory in many countries but also a standard practice without legal obligation in other countries¹². Alongside core prescribing indicators complimentary indicators such as percentage of patients treated without drugs, average drug cost per encounter, percentage of drug costs spent on antibiotics and on injections were also assessed.

Statistical Packages for Social Sciences (SPSS) version 26 was used to calculate means, standard deviations (SD), percentages and frequencies. Method of calculating core prescribing indicators and reference WHO parameters for prescribing indicators to which the results of the study were compared¹³ (table-I). Cost of each prescription was calculated by checking prices of individual medicine from Pharma Guide available online and mobile app¹⁴.

RESULTS

The total number of prescriptions that met the study criteria was 800. The mean age of the patients was 28 ± 20 with 316 (43%) male and 427 (57%) females. The average number of medicines per prescription was 3.11 ± 1.2 (range 8). Out of total 2491 medicines prescribed only 58 (2%) were prescribed according to their generic names and 1671 (67%) of the medicines were from EML. Almost half of the prescription (41%, n=325) contained antibiotics but only 62 (8%) patient encounters had injections prescribed (table-II).

Among complementary indicators there were zero per cent of patients treated without drugs. The average cost per treatment encounter was 479 ± 28 PKR

Table-I: Method of calculation of prescribing indicators with reference to world health organization parameters.

Prescribing Indicators	Method of Calculation	WHO Standard Value or Percentage
Average number of drugs per encounter	(Number of prescribed medicines/Number of prescriptions)	1.6-1.8
Percentage encounters with antibiotics prescribed	(Number of prescriptions with at least 1 antibiotic/Number of prescriptions) x 100	20.0-26.8
Percentage encounters with injection prescribed	(Number of prescriptions with at least 1 injection/Number of prescriptions) x 100	13.4-24.1
Percentage of drugs prescribed by generic name	(Number of medicines prescribed by generic name/Number of medicines prescribed) x 100	100
Percentage of drugs prescribed from the national essential drug list	(Number of medicines prescribed on essential medicines list/number of medicines prescribed) x 100	100

(\$3). Percentage of drug cost spent on antibiotics and injections was similar and was approximately 7% (table-III).

Table-II: Analysis of core prescribing indicators.

Prescribing Indicators	Total Drugs/ Prescriptions (n)	Mean or Percentage	WHO Standard Value
Medicines / prescriptions	2491	3.1 ± 1.2	1.6-1.8
Prescriptions with antibiotics	325	41%	20-26.8%
Prescriptions with injections	62	8%	13.4-24.1%
Medicines prescribed by generic name	58	2%	100%
Medicines from essential drug list	1671	67%	100%

Table-III: Analysis of complementary indicators.

Complementary Indicators	Total Number or Cost	Mean ± Standard Deviation	%
Patients treated without drugs	-		
Drug cost (Pakistani Rupee)	382782	479 ± 928	
Drug costs spent on antibiotics (Pakistani Rupee)	28361	139 ± 119	7
Drug costs spent on injection (Pakistani Rupee)	25200	125 ± 948	7

The most common categories of medical conditions for which the patients were seen were diseases of gastrointestinal system 192 (24%) followed by that of respiratory 171 (21%), Skin 99 (12%), musculoskeletal 88 (11), chronic medical conditions 54 (7%), urinary tract infections 39 (5%) and psychiatric illnesses 35 (4%). About 12% of prescriptions did not have a diagnosis written on them.

DISCUSSION

Findings of this study are indicative of irrational prescribing practices such as polypharmacy, profound low level of generic prescribing, misuse and over use of antibiotics and limited compliance to national essential medicine list. The mean drug per prescription in our study was 3.1 ± 1.2, which was higher than the WHO benchmark of 1.6-1.8. The figure in the present study is comparable with other studies done nationally

in public health facilities including a study by Hussain *et al*, getting an average value of 2.9 drugs per prescription¹⁵, but slightly better than another study conducted in Abbottabad by Ullah *et al*, showing an average 4.1 drugs per prescription¹⁶. On the other hand, our study value is higher when compared to international studies in Low- and Middle-Income Countries including a study done in North India by Tripathy *et al* showing an average 2.2 drugs in a single prescription¹⁷, and study conducted in Eritrea by Amaha *et al* showing an average value of 1.76 drugs per prescription¹⁸. There are not enough good quality studies looking into the reasons for polypharmacy but it may be related to various factors such as multiple prescribers, ageing population, complex medical therapies and psychosocial contributions, financial incentives and lack of training of prescribers¹⁶. However, in the present study majority of patients were young with an average age of 27 and seen by single prescriber for common conditions. Higher number of medicines prescribed always needs to be justified and must be supported by clinical requirements because of the increased risk of adverse drug events.

More than two thirds of the drugs (67%) were prescribed from EML. Though this is below the WHO standard of 100% but the figures are encouraging as compared to national average of 50% and comparable to figures (72%) of low and middle-income countries¹⁹. Essential medicines are those that are safe, cost effective and selected by keeping in view the disease prevalence and public health relevance and hence fulfilling the health care requirements of majority of population. Pakistan has EML currently containing 428 medicines. However due to lack of effective drug registration policy at the government level without due consideration of local bio-equivalency and comparative costs has led to disproportionate registration of drug products⁸. This has led to steady increase of expensive originator brands at expense of affordable low-price essential generics. This was reflected in our study as well whereby very low percentage of drugs (2%) was prescribed by their generic names. According to WHO guidelines an international non-proprietary name (INN), also referred as a generic name, categorises a pharmacological substance or active pharmacological component by an exclusive name that is universally documented and is a public property²⁰. The figure in our study is well below the ideal standard of 100% as well as lower than the national average of 25%¹⁴, and international figures. A study in India by Tripathy *et al*¹⁶, covering 12 districts in two states covering all levels of care

found that the drugs were prescribed in their generic names in 70% of cases. A study of the drug prescribing analysis in 12 developing countries reported percentages of drugs prescribed by generic names ranging from 37-94%¹¹. The reasons for low percentage in our study could be due to multiple reasons such as non-compliance of essential drug list, procuring originator drug brands, slow market penetrate rate of generic due to delayed approval, open access of prescribers to industry agents and salespersons, lack of educational intervention, lobbying by special interest groups and manufacturers²¹. A recent study by Saeed *et al*, showed not only poor availability of lower priced generic drugs in public sectors in Pakistan below the WHO benchmark of 80% but in fact the mean percent availability reduced from 35% in 2017 to 9% in 2019²².

Irrational prescribing of costly branded drugs compared to low-cost generics results in cost inefficiencies and poor patient compliance resulting in poor treatment outcomes. The mean cost of prescription in our study was 479 PKR (approximately \$3), which is below the WHO affordability index. This index defined as if a patient has to spend >1 day of salary of the lowest paid unskilled government employee in a month for a specific treatment²³. The average cost per treatment encounter in daily wages was 0.8 days wage based on salary of 17500 PKR by Wage indicator (2020)²⁴. However, approximately one third of the population lives below the national poverty line in Pakistan and 20% make less than the lowest-paid unskilled government employee²⁵. In addition, Pakistan spends lower than WHO benchmark of \$2 per capita per year on drugs in health sectors⁸. This inevitably leads to medicine shortages at government health facilities driving patients to purchase from private retail pharmacies. Although the cost spent both on antibiotics and injections was only 7% of each treatment encounter, but this indirectly means that majority of patient budget goes towards purchasing medicine for chronic illnesses such diabetes, hypertension, ischemic heart disease, asthma and acid reflux disease.

In the present study, 8% of the encounters had injection prescribed that is lower than the WHO standard (13.4-24.1 %) and way below the national average of 60%¹⁹. The lower predominance of injection might be due to outpatient setting in our study as well as social norms against this form of treatment intervention in the study area. However, overuse of antibiotics in up to 41% of cases is concerning, which is higher than the WHO standard figures of up to 26.8% but compar-

able to median figure of 41% evidenced in the study of 12 lower and middle-income countries by Hogerzeil *et al*¹¹. Over prescribing of antibiotics in conditions such as upper respiratory tract infection and gastrointestinal conditions warrants urgent inter-vention by instituting antibiotic prescription guideline and monitored closely through prescription audits. Such overuse of antibiotics causes avoidable adverse events, contributes to antimicrobial resistance and unnecessary treatment costs.

Another area of concern in our study was that none of patients were treated without drugs suggesting patients were not counselled properly because as many as one third of patients may not require drug treatment.

Implications for Policy, Practice and Research

A multi-disciplinary approach through national drug regulation authority involving other stakeholders such as health care professionals, pharmaceutical industry and consumer groups is required to formulate and implement medicine use policies by enforced regulation.

Problem based pharmacotherapy training and continued medical education of prescribers to promote adherence to national drug policy, generic prescribing, and to avoid prescribing inappropriate antibiotics and costly branded drugs.

INN prescribing should be encouraged through education among the trainee doctors in medical schools.

Regular audits and monitoring are needed to ensure appropriate antibiotic prescribing and compliance with local treatment guidelines as well as essential medicine list.

ACKNOWLEDGEMENTS

We acknowledge all the doctors and health-care workers working at different health facilities of Mirpur for providing a comfortable environment for accessing information and data collection. A special thanks to National University of Medical Sciences (NUMS), Rawalpindi for funding our project.

CONCLUSION

This is the first study to give a snapshot of prescribing practice patterns of patients visiting public health facilities in Kashmir region of Pakistan. The prescribing practices for all the core prescribing indicators except injectables were below the WHO standards indicative of irrational prescribing practices such as polypharmacy, use of costly branded drugs other than

generics, inappropriate and over use of antibiotics. Among complementary prescribers, there were no prescriptions without drugs suggesting lack of counselling on physicians' part. A multi-disciplinary approach involving authorities, industry and professionals is required to promote rational prescribing. This study will serve as a baseline to assess the needed strategies that will promote the rational use of medicine in Kashmir.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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