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Original Research Article

Practices regarding prescription and dispensing of drugs in a tertiary care hospital in rural West Bengal, India

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ABSTRACT

Background: Irrational prescription practices are a distressing global problem, especially in the developing countries. A study was conducted to assess the patterns of prescribing and dispensing drugs in a tertiary healthcare centre serving a large rural population in the eastern India.

Methods: A cross-sectional observational study was conducted from July-September 2016 in the general out-patient department and the institution pharmacy of a tertiary care hospital of West Bengal, India. Data were congregated by collection and review of individual prescriptions, measuring the time of interaction between patients and prescribers/dispensers, and conducting patient interviews at exit.

Results: Analysis of the collected and tabulated data revealed that after average, 2.5 medicines were prescribed per prescription, with 95.26% being under their generic name. Of the drugs prescribed, 95.79% were from the essential drug list. The average consultation time was 150.0s (SD 62.3s) and average dispensing time was 81.5s (SD 51.2s). Of the drugs prescribed, 86.12% of drugs were actually dispensed from the institution pharmacy but none of the drugs were labeled. The percentage of prescriptions with an antibiotic was 47.83%, while injections were recorded on in 2.83% of the prescriptions. Percentage of patients who had knowledge of the dosage of the drugs prescribed to them was 91.67%.

Conclusions: While the study found high percentages of drugs prescribed under generic names high percentage of drugs actually prescribed from the Institution Pharmacy, prescription of drugs from the Essential Drugs List, and a low number of injections per prescription conforming to WHO set standards, it also found a lack of drug labelling, high percentage of prescription of antibiotics to be indicators that do not conform with the WHO set international standards.

Keywords: Drug use indicators, Rational drug use, West Bengal

INTRODUCTION

Prescription practices have always been one of the most important aspects of medical care, mostly because of its ability to single-handedly determine not only the general trends in the prescription and use of drugs in a population, but also the overall development and progress of the healthcare system in a particular region. Not only that, prescription practices also provide us with an insight into the general state of physician-patient relationship in a healthcare setting, and how it compares to that of the rest of the world. Therefore, determining the general trends of medical care practices among the healthcare professionals is immensely important in the understanding and improvement of the state of medical care in a geographical region.

Irrational drug prescribing and dispensing is a widely pervasive and serious problem plaguing the healthcare system all around the world. According to the WHO, medicine use is rational when patients receive the appropriate medicines, in doses that meet their individual requirements for an adequate period of time, at the lowest cost to both them and the community.[1] When one of these

conditions is not met, the medicine practice is deemed irrational. It is estimated that worldwide, over half of all medications are prescribed and dispensed inappropriately, and that half of all patients fail to take their medications as prescribed or dispensed.[2-4]

Irrational use of drugs can take different forms, as for example, polypharmacy, over-use of injections and antibiotics for diseases that do not necessarily require them for the treatment, failure of adherence to the standardized clinical guidelines and treatment regimens, and inappropriate self-medication.

In the developed nations, irrational drug use has led to adverse medication events to become one of the top 10 causes of death.[5,6] Irrational prescription and dispensing practices cost an estimated £466 million annually in the United Kingdom and up to $5.6 million in the US every year.[7-9] In the developing and the transitional countries, the situation is far worse.[10]

In the World Medicine Situation 2011, the WHO reports that in the developing countries like India, Bangladesh, Nigeria, Nepal etc. about 80% of all prescribed medicines are dispensed, but often by unqualified personnel. The report further states that on an average, the dispensing time is only 1 minute, only half of the patients are told how to take their medicines, about one-third do not know how to take their medicines immediately on leaving the facility, and that 20-50% of the medicines dispensed was not labeled. [11]

To assess the extent of the problems posed by the irrational practice of medicine on the populace of the world, the World Health Organization (WHO) has developed a number of indicators to determine prescribing and dispensing practices among healthcare professionals.[12] These widely tested, validated and standardized indicators have been used to a great effect in several countries, especially in the developing world countries like Bangladesh, Burkina Faso, Cambodia, Ethiopia, Ghana, Lebanon, Morocco, Nepal, Nigeria, Pakistan, Tanzania, Zimbabwe etc. where the scale of the problem is much greater.[13-24]

To improve the prescribing practices of a region, a baseline of current trends in practices among the physician-patient population must be understood and set. This is especially true for a country like India, where 67% of the population live in rural areas and there is often a palpable difference in the healthcare services provided between the facilities serving the rural and the urban populations of the country.[25]

The present study was undertaken in North Bengal Medical College and Hospital, Darjeeling, West Bengal; a tertiary healthcare centre of Eastern India, catering to predominantly the rural and semi-urban population residing in this part of the country, with an aim of determining the practices of physicians and medical personnel in day-to-day encounters with their patients in a tertiary care hospital, utilizing the standardized tools developed by the WHO.

The objectives of the study were to determine the prescription and dispensing practices in the General Out-patient Department of a tertiary care hospital in rural West Bengal, India.

METHODS

Study type and format: The study was a cross-sectional study using the Drug Use Indicators developed by the World Health Organization (WHO), utilizing all of the core indicators mentioned, under the following headings:

Prescribing indicators

- Average number of drugs per encounter
- Percentage of drugs prescribed by their generic name
- Percentage of encounters with antibiotics prescribed
- Percentage of encounters with an injection prescribed
- Percentage of drugs prescribed from essential drug list or formulary

Patient care indicators

- Average consultation time
- Average dispensing time
- Percentage of drugs actually dispensed
- Percentage of drugs adequately labeled
- Patient's knowledge of the correct dosage*
  *The patient's knowledge here refers to his/her ability to recall and repeat the dosage schedule of all the drug(s) prescribed and/or dispensed to him/her, as written in the prescription.

Facility indicators

- Availability of a copy of essential drug list or formulary
- Availability of key drugs

The study period was three months (July-September 2016), with 4 non-consecutive weeks of data collection. The study was performed in the General Out-Patient Department (GOPD) as well as the Institution Pharmacy of North Bengal Medical College. A total of 600 prescriptions of 'new' physician-patient encounters (all follow-up cases were excluded) were analysed and studied, and the dispensing and prescribing times were noted and calculated for an equal number of encounters.

The researchers took the first 50 consecutive new encounters and prescriptions each day of sampling for the study. These cases that were referred from the GOPD to another department for treatment were excluded from the study sample.

The team of two researchers collected prescriptions from the patients for 6 consecutive days for 2 weeks to account for the day-to-day and physician-to-physician variations in prescription practices and consultation times. 50 separate prescriptions were obtained daily, for a total of 600 prescription sample for the study.

The information on the dispensing practices was obtained from the Institution Pharmacy by a similar method, gathering data for 600 prescriptions. The knowledge of the patient about the dosage of the drugs they were prescribed was assessed after they exited the Pharmacy by asking them to recall the dosage of the drugs they were prescribed and comparing their responses with the dosage written on their prescriptions.

Statistical analysis

The data was systematically entered in MS Excel and was analysed thoroughly, using tools of descriptive statistics.

RESULTS

The average number of drugs prescribed per prescription was 2.50, with the number of drugs varying from 1 to 5. In most of the prescriptions, 2 drugs were prescribed, accounting for 35.7% of the total prescriptions. In 15.5% of the prescriptions, 1 drug was prescribed, while only 3.2% of the prescriptions contained 5 drugs. Of the 600 prescriptions studied, a total of 1499 drugs had been prescribed. Of these, 1426 drugs, or 95.3% of the drugs were prescribed under their generic name. At least one anti-microbial was prescribed in 47.8% of the prescriptions examined, while injections were prescribed in only 2.8% of the prescriptions.

Table 1: The prescribing indicators with the recommended standard values.

Indicators	Frequency	Standard value*
Drugs prescribed per encounter	2.5	<2.0
Drugs prescribed by generic name	95.3%	100%
Encounters with antibiotics	47.8%	<30%
Encounters with injections	2.8%	<20%
Percentage of drugs from the essential drugs list	95.8%	100%

* based on Isah AO et al. The development of standard values for the WHO drug use prescribing indicators.[26]

Table 2: The patient care indicators.

Indicators	Average/percentage
Average consulting time	2.50 minutes
Average dispensing time	1.35 minutes
Percentage of drugs actually dispensed	1291 (86.12%)
Percentage of drugs adequately labelled	0 (0%)
Patient knowledge of the correct dosage	550 (91.67%)

Table 3: The distribution of drugs per prescription.

Number of drugs per prescription	Number of prescriptions (%)
1	93 (15.5%)
2	214 (35.7%)
3	213 (35.5%)
4	61 (10.2)
5	19 (3.2%)
Total	600 (100%)

The average consultation time per encounter was 2.5 minutes or 150.0 seconds (SD = 62.3 seconds) (range from 53 seconds- 7.1 minutes), and the average dispensing time was 1.35 minutes or 81.5 seconds (SD = 51.2 seconds) (range from 15 seconds- 6.1 minutes). Of the 1499 drugs prescribed 1291, or 86.1% of the drugs were actually dispensed from the Institution Pharmacy.

Of the drugs prescribed, 95.8% of the drugs were from the National List of Essential Medicines 2015, a copy of which was available in the Institution Pharmacy. None of the drugs dispensed by the pharmacy were labeled, however, the dosage of the drugs and instructions on how to take them were verbally explained to the patients. Of the total patients interviewed, 91.7% had a sufficient knowledge of the dosage of the drugs prescribed to them.

DISCUSSION

The number of drugs prescribed per prescription is a major component of the prescribing indicators and can provide a basic knowledge about the prevalence of poly-pharmacy among the healthcare professionals in a region. As per the WHO standards, a value of 1.6-1.8 drugs per encounter is optimal.[26] However, this value varies widely not only in different countries around the globe but in different regions of the same country. For example, in countries like Ethiopia, Sudan and Zimbabwe the average number of

drugs per prescription varies from 1.3-1.6, while in countries like Iran or Nigeria it is more than double, and even reaches as high as 3.8.[27-31] Regional variations within the country has been demonstrated in prescriptions from various parts of India, with value varying between 2.7 and 3.2.[31-38] While the present study findings of 2.5 drugs per prescription are slightly lower than from other parts of India, it is still higher than the recommended international standards.

With current advances in the field of medicine, a growing concern among the global populace is the ballooning of healthcare costs. One of the most important determinant of this problem is the practice of prescribing drugs and formulations by their brand-names rather than their generic names by the physicians, the prices of the former being substantially higher.[39] This often make essential drugs out of reach for patients in the lower socio-economic strata, who are the ones that are the most vulnerable to all forms of diseases and are in most need of these drugs. This problem is especially alarming in the developing and transitional countries of the world, such as India.[40] The study found that 95.26% of the total drugs prescribed were prescribed in their generic names, a value which is close to the close to the standard (100%) (Table 1) and much higher than that found in a 2007 study done in West Bengal (38%) and studies done in other countries like Nepal (13%) and Nigeria (54%).[32,37,41] This can be attributed to the guidelines issued by the Medical Council of India in 2013 and the growing awareness among the healthcare practitioners.[42]

The proportion of prescriptions with injections was found to be 2.83%, which is well below the maximum recommended value, probably because of the study setting, which is a general outpatient department, where diseases requiring parenteral drugs are not commonly encountered. In a specialized department like surgery or oncology, and in an inpatient setting, the number of injections per prescriptions is expected to be much higher.

With advancements in healthcare across the world, a particularly dangerous problem that has emerged is the over-prescription of antibiotics. In the developing countries of the world such as India, this has led to unprecedented rise in antibiotic resistance, causing significant rise in the morbidity and mortality among the population.[11] A significantly large number of prescriptions containing antibiotics, (47.8%) was found in our study, against the standard (20.0-26.8%).[26] The study area being endemic to malaria, tuberculosis, pneumonia and water-borne diarrheal diseases and the study period (July-September), when there is an increase in the reporting of the aforementioned diseases in this region of India may be the reason for this reported increase in antibiotic prescriptions.[43] Studies throughout the year need to be undertaken to rule out seasonal differences in antibiotic prescriptions.

The average consultation time in the present study was higher than that reported by Sarkar AP et al (45 sec; SD 27.8), in their study in the OPD of a district hospital of West Bengal, India but lower than the 3.7 min reported by Prasad PS et al, or the 12 min 49 sec reported in a study conducted in a private tertiary care teaching hospital in South India.[32,44] The General Out-Patient Department of the hospital, an extra caters to a large patient population daily, being the sole tertiary care hospital in North Bengal, serving patients from 6 districts (Darjeeling, Alipurduar, Uttar Dinajpur, Dakshin Dinajpur, Jalpaiguri, Coochbehar), and also patients from parts of Bihar, Sikkim, Assam, and from the neighbouring country of Nepal. This massive inflow of people results in more than 100 doctor-patient encounters per doctor per day in the GOPD alone. The situation at the pharmacy is worse, as it has to cater to patients outpatient departments of the hospital. Labelling of drugs was virtually non-existent in the pharmacy although the dosage of the drugs was verbally explained to the patient. The standard of adequate labelling of dispensed drugs is 100%.

To properly tend to the healthcare needs of a population in a region, drugs must be selected based on their relevance to the existing healthcare problems in the region, their efficacy and safety, and comparative cost-effectiveness. For this reason, the WHO publishes the WHO Model List of Essential Medicine, revised every two years, to be followed by healthcare professionals and pharmacists all over the world. Based on this Model list, Governments of individual countries publish their own national lists of essential medicines. In India, this list is called the National List of Essential Medicines, a copy of which is supplied to Healthcare facilities all across the country. Regular update of the status of available drugs at the pharmacy to the outpatient departments helps the physicians in deciding prescription drugs from the list.

During interview, almost all (91.7%) the patients correctly remembered the dosage of the drugs prescribed to them, close to the optimal value of 100% as recommended. These interviews were conducted just at the time of leaving the pharmacy. In the absence of labelling of the drugs, the patients are prone to make mistakes that may result in under or overmedication leading to serious complications.

Care was taken to gather data as discreetly as possible, keeping both the prescribers and the dispensers ignorant of the exact nature of the study, in order to minimize any bias regarding data collection and analysis.

CONCLUSION

The present study analysed the drug prescribing practices at a tertiary care hospital General Out-Patient Department and the Institution Pharmacy. Although some of the parameters were within optimal limits and conformed with the prescribed standards, a number of the parameters deviated from rational prescribing practices, which include

too many antibiotics in prescriptions, a low average consultation and dispensing time absence of drug labelling.

This can be solved by lowering of the patient load on the healthcare facility as well as conducting periodic appraisal of drug prescribing practices at the facility to promote rational drug use.

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