A STUDY OF THE ANTIBIOTIC PRESCRIPTION PATTERN AMONG THE INDOOR PATIENTS IN THE MEDICINE DEPARTMENT OF A TERTIARY CARE HOSPITAL IN NORTH EAST INDIA

Indrani Bhagawati[1], Bhaskarjyoti Thakuria[2]

[1]Associate Professor, Department of Pharmacology, Fakhruddin Ali Ahmed Medical College, Barpeta, Assam.
[2]Demonstrator, Department of Pharmacology, Fakhruddin Ali Ahmed Medical College, Barpeta, Assam.

ABSTRACT

BACKGROUND

Antibiotics are among the most commonly prescribed drugs in a hospital setting, be it paediatric or adult age group. These are substances or compounds which are used to treat infections caused by microorganisms including fungi and protozoa. Their inappropriate and indiscriminate use can potentially cause a number of problems. Because of an overall rise in health care costs, lack of uniformity in drug prescribing and the emergence of antibiotic resistance, monitoring and control of antibiotic use is of growing concern and strict antibiotic policies should be warranted. Before such policies can be implemented, detailed knowledge of antibiotic prescribing practice is important.

MATERIALS AND METHODS

A cross sectional, retrospective study was carried out in the Department of Medicine at a Tertiary Care Hospital from May to August 2016. The records of all patients admitted during the study period will be examined. Proportion of patients who were prescribed antibiotics will be found out and details of antibiotic use within this period will be isolated.

RESULTS

300 patients were prescribed antibiotics; 49% were male. 385 antibiotics were prescribed. 45% (135) of the patients were on therapy with a single antibiotic, 50% (151) of patients were on therapy with two antibiotics while 5% (14) of patients were on therapy with three antibiotics. Most commonly prescribed antibiotics were cephalosporins followed by quinolones, penicillins, aminoglycosides and macrolides.

CONCLUSION

Antibiotic usage was found to be reasonable although polypharmacy was prescribed. Usage of generic drugs was considerable and broad-spectrum antibiotics were highly used.

KEYWORDS

Cross-Sectional Study, Antibiotics, Drug Utilization.

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BACKGROUND

One of the ways in which standards of medical treatment and health care at all levels could be enhanced is via performance review and audit that sets the standard of medical treatment and assesses the quality of health care at all levels, and this should become part of everyday clinical practice.[1] This, in turn, promotes the quality of life of the patients thus leading to a beneficial effect on the health care standards of the country. The study of prescribing patterns seeks to monitor, evaluate and suggest modifications in practitioners' prescribing habits so as to make medical care rational and cost effective.

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Corresponding Author:
Dr. Bhaskarjyoti Thakuria,
House No. 28, Manik Nagar, Zoo Road, Guwahati,
P.O. Dispur District, Kamrup, Assam, India.
E-mail: bhaskarthakuria4u@gmail.com
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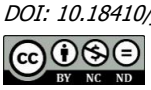

The bacterial disease burden in India is among the highest in the world. Antibiotic use has been increasing steadily and the units of antibiotics sold has increased by about 40 per cent. Excessive and inappropriate use of antibiotics in hospitals, health care facilities and the community contribute to the development of bacterial resistance. It is necessary to have information about antibiotic utilization patterns in order to develop a constructive approach to the problems that can arise due to the availability of multiple antibiotics nowadays.[2] Another important thing is the burgeoning cost of drugs and health care at the community level in a developing country like India.[3] Poor quality prescriptions, under- and overdosing, duplication and multiplicity of drugs on the restricted purse of the sick especially of the lower socio-economic strata is playing a deleterious impact on the non-health household expenditures such as food, clothing and education.

In India reports on antibiotic utilization at an institutional level include both cross-sectional.[4] and longitudinal studies.[5,6] of prescribing patterns. The present article reports the result of an antibiotic prescription audit in a tertiary hospital in a North Eastern state of India to

quantify any excessive and inappropriate use of antibiotics that may lead to development of antibiotic resistance and the correlation between the prescribing behaviour of medical practitioners and the concept of essential drugs.

MATERIALS AND METHODS

We conducted a hospital-based, cross sectional, retrospective study among the inmates of the Medicine ward of a tertiary care hospital in a north eastern state of Assam. Using purposive sampling we took a sample size of 300. A random, once weekly data collection was done for a 4 month duration from May, 2016 to August, 2016. Patients more than 17 years of age of either sex, inpatients of the Medicine ward and those receiving antibiotics were included in the study. On the other hand neonates and patients of paediatric age group, those receiving IV fluids and blood transfusion were excluded from the study. Besides referred patients from other departments were excluded from the study. Informed consent was obtained verbally from the patient or legal guardian. The adherences of antibiotics prescription were checked with the WHO essential drug list (EDL).[7] The ethical clearance was obtained from the Institutional Ethics Committee. Drug utilization was assessed by the World health organization (WHO) core drug indicators such as prescribing indicators.[8] The candidates were analysed for-

- Total number of prescriptions analysed
- The average number of drugs per patient
- Total number of drugs prescribed
- Number of antibiotics given as monotherapy
- More than one antibiotic prescribed
- Total number of antibiotics prescribed
- Number of injectable preparations.

These were the proposed prescribing indicators[9] selected by us before commencing the study. The source of data will be the patient case sheet in the Medicine wards. Both patient related and drug related information will be recorded on a data collection sheet containing the following queries-

1. Hospital number
2. Date
3. Age
4. Sex
5. Address
6. Marital status
7. Occupation
8. Provisional diagnosis
9. Name of prescribed drug(s)
10. Total number of drugs used in the prescription.
11. Classes of drug used
12. Prescribed strengths and regimens of the drugs
13. Duration of administration
14. Route of administration of each drug
15. Number of generic drugs
16. Fixed dose combinations used
17. Condition of patients on discharge.

The data will be analysed for ratio and percentage using MS Excel sheet.

RESULTS

Male patients comprised 49% of the total inmates while females comprised 51%. Analysis of age showed that 47% of the patients were in the age group 17-40 years, 34% in the age group 41-60 years and 19% fell in the age group above 60 years of age. 27% of the patients came from within 5 kms distance from the hospital, 60% of them from a distance more than 5 kms but within the same district and the remaining 13% patients came from a different district. The average number of drugs per prescription was 5 per prescription. The total number of drugs prescribed was 1492 and out of this the total number of antibiotics prescribed was 385. 45% (135) of the patients were on therapy with a single antibiotic, 50% (151) of patients were on therapy with two antibiotics while 5% (14) of patients were on therapy with three antibiotics (Figure 1). Out of the 385 antibiotics prescribed a total of 322 (83.6%) were injectable preparations.

Out of the 385 antibiotics prescribed, 128 (33.25%) were cephalosporins, 103 (26.75%) were quinolones, 77 (20%) were penicillins, 26 (6.75%) were aminoglycosides, 26 (6.75%) were macrolides while the remaining 25 (6.50%) were other antibiotics like nitroimidazoles and beta-lactamase inhibitors (Figure 2).

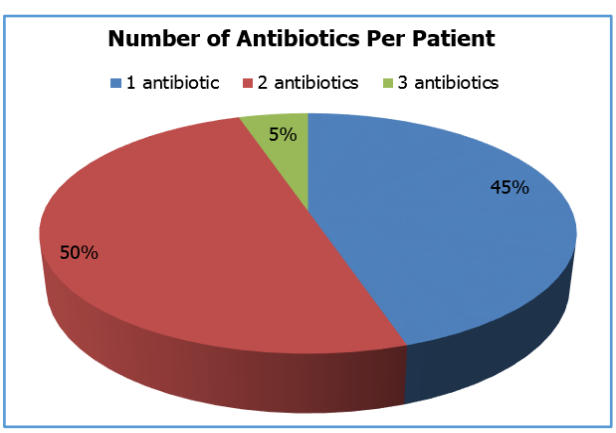

Figure 1. Showing the Distribution of the Patients According to the Number of Antibiotics Prescribed

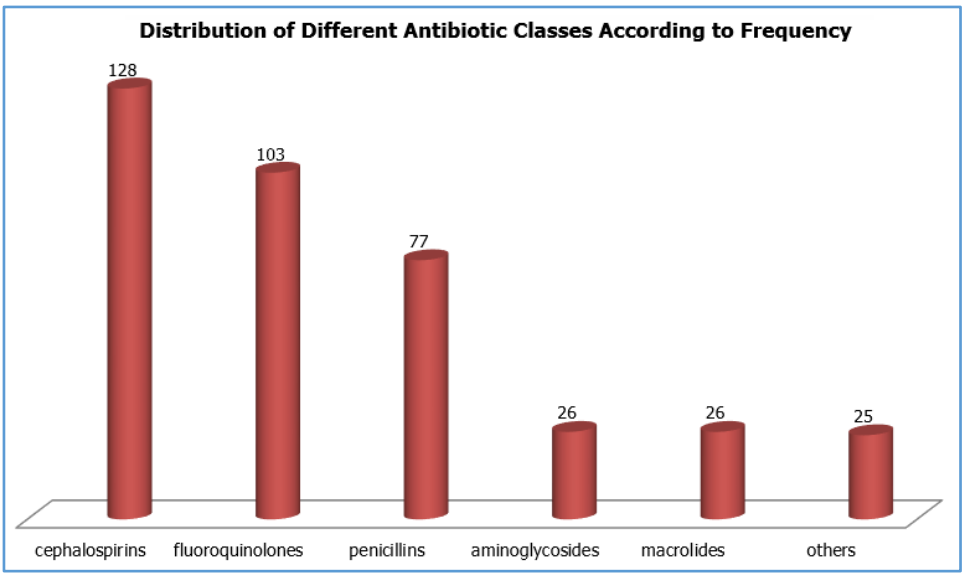

Figure 2. Showing the Distribution of Antibiotic Classes According to Frequency

DISCUSSION

In antibiotic prescription analysis studies like drug utilization, the average number of drugs per prescription is the most frequently used measure. In this study the average number of drugs per prescription is 5 indicating polypharmacy. This was in accordance with the study by Kuruvilla et al.[4] that documented an average of 1 to 7 drugs per prescription. Regarding antibiotic usage the present study reveals that the prescription of antibiotics increased with an increase in the number of drugs per prescription. It was seen that more than 1 or 2 antibiotics were frequently prescribed as the total number of drugs per prescription reached 5 or 6. This, in essence indicates irrational prescribing. In this study a total of 95% patients were on therapy with 1-2 antibiotics. This was in accordance with the study by Badar et al[10] which had 77% of patients on 1-3 antimicrobials. In this study it was seen that that cephalosporins followed by fluoroquinolones were the most frequently prescribed drug followed by penicillins, aminoglycosides and then macrolides. In another study by Ahmad et al.[11] the most frequently used antibiotics were cephalosporins, followed by fluoroquinolones and then penicillin while in the study by Kumar Abhijit et al.[12] the most frequently prescribed antibiotic was again cephalosporins followed closely by fluoroquinolones. In contrast to these in the study by M.M. Ahmed et al.[13] the major antibiotic prescribed were quinolones, followed by penicillins and then by cephalosporins. On the other hand, in another study by Shankar et al.[14] ampicillin and amoxicillin (broad spectrum penicillins) were the most commonly prescribed followed by metronidazole (nitroimidazoles) and then by ciprofloxacin (fluoroquinolones). Prescription of fixed dose formulations was limited but contributed to 130 (43.3%) of the total number of prescriptions. This was in contrast to the study by Kumar Abhijit et al.[12] where fixed dose combinations accounted for 84% of prescriptions. Again 83.6% of the antibiotics prescribed were injectable forms when compared with the study by Kumar Abhijit et al[12] which had 95.6% of injectable preparations. Out of these ceftriaxone-sulbactam was the most frequently prescribed fixed dose formulation (32%) and was followed by amoxicillin-clavulanic acid.

CONCLUSION

The prescribing pattern of physicians in the tertiary government hospital shows that polypharmacy was resorted to often. Prescribing was irrational in that the prescription of antibiotics increased with the number of drugs per prescription. The usage of generic drugs in the study was considerable but that of fixed dose formulations was to a lesser extent. Polypharmacy was prescribed as more than 50% of the prescriptions had two or more antibiotics prescribed and this increased with the number of drugs per prescription. The same can be said about the number of injectable forms prescribed as more than 80% of the prescriptions had parenteral antibiotics and this increased with the number of drugs per prescription.

Antibiotic usage was found to be reasonable in most of the cases as most of the antibiotics prescribed were from the essential drug list (EDL). Broad spectrum antibiotics were highly used. Cephalosporins followed by quinolones were the most commonly prescribed antibiotics and the parenteral (injectable) route was preferred. Average number of drugs per prescription was high (n=5) and this may increase the risk of drug interactions leading to polypharmacy.

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