SURVEY OF ANTIBIOTIC UTILIZATION AT SHEIKH ZAYED HOSPITAL, RAHIM YAR KHAN

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ABSTRACT

Background: Irrational use of multiple antimicrobial agents in hospitals may cause the emergence of resistant microorganisms, as well as increase costs and unnecessarily exposure of patients to potentially dangerous drugs. **Objective:** To determine prescribing patterns of antibiotics among hospitalized patients, and to evaluate the antibiotic consumption. **Materials & Methods:** In this cross sectional study we analyzed the patient's drug charts in medical and surgical wards from July to August 2010 at Sheikh Zayed Hospital, Rahim Yar khan. **Result:** Record of 800 patients, was analyzed. Antibiotics were given to 650 patients (81.2%) with the mean age of 38.17 years. Route of administration was intravenous (84.4%), oral (2.3%) and both (13.2%). Patient receiving single antibiotics were 38.1%, while 61.8% received multiple antibiotics. Average number of antibiotics prescribed per patient was 1.8. The range of antibiotics used included 14 active ingredients with 21 different brands. Most commonly prescribed drugs were Ceftriaxone (65.3%), Metronidazole (49.3%) and Quinolones (31.6%). **Conclusion:** Multiple medications are a well-known potential risk factor in terms of patient's health. They increase the risk of drug-drug interactions and adverse drug reactions in all age groups. Moreover, irrational use of antibiotics may lead to emergence of microbial resistance. There is a high proportion of patients receiving multiple antibiotics in in-patient department of Sheikh Zayed Hospital, Rahim Yar Khan, and hence local guidelines should be established for use of antibiotics.

Keywords: antibiotics, polypharmacy, resistant, drug utilization

INTRODUCTION

Drug utilization has been defined as the marketing, distribution, prescription and use of drugs in a society, with special emphasis on the resulting medical and social consequences.[1] Evaluation of the quality of health care is an essential component of health system research.[2] Antibiotics are one of the most frequently used drugs in outpatient and inpatient care, and their irrational use is considered to be an important risk factor for the development and spread of antimicrobial resistance.[3] During the past two decades, resistance to antibiotics has become a major public health concern, due to the rapid spread of multi-resistant bacterial clones and decreasing availability of new antibacterial drugs.[4, 5] Antimicrobial resistance is increasing world wide to gram-positive, as well as gram-negative bacteria.[6,7] Irrational antibiotic use contributes to the emergence of antimicrobial resistance..[8] In developing countries, antibiotics are prescribed to 44.97% of patients in hospitals, often unnecessarily or inappropriately.[9-12] Today, reducing medication errors and improving patient safety has become a common topic of discussion. Improving the judicious use of medications and minimizing adverse drug reactions has always been key areas of research and study for those working in clinical pharmacology. The practice of medicine, pharmacy and nursing in the hospital setting is very complicated. Many steps occur from "pen to patient", and there is a lot to analyze. Implementing safer practices requires developing safer systems.[13]

The present study was carried out to determine prescribing pattern and utilization of antibiotics at the Sheikh Zayed hospital, Rahim Yar Khan. It is hoped that this study will generate base line data that will adequately evaluate the medical practices pertaining to safe and appropriate antibiotic prescription.

MATERIALS & METHODS

This cross-sectional study was conducted at Sheikh Zayed hospital by Department of Pharmacology and Therapeutics, Sheikh Zayed Medical College, Rahim Yar Khan.

The data of 800 consecutive patients from both surgical and medical wards was collected from July-August 2010. 500 patients from medical ward and 300 patients from surgical ward were included in the study, with equal gender distribution, regardless of clinical presentation & diagnosis.

Information about patient's age, gender, route of drug administration and different groups of antibiotics was gathered. After getting the required data, we calculated average age of patients, route of administration, average number of antibiotics per patient and frequently used antibiotic in medical and

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surgical wards. The results were summarized in the tables and computer based analysis was used for processing the data.

RESULTS

Out of 800, 650 (81.2%) patients received antibiotic therapy. 248 (38.1%) patients were given single antibiotic, while 402 (61.8%) received multiple antibiotics. Antibiotic utilization was 100% in surgical ward, while in medical ward it was 70%. Mean age of patients observed was 38.17 years, and number of antibiotics prescribed per patient was 1.8. Most commonly used route of administration was intravenous route (84.4%), followed by intravenous & oral routes (13.23%) and 2.3% received oral antibiotics only.

The most frequently used antibiotics were Ceftriaxone (65.3%), followed by Metronidazole (49.3%), Quinolones (31.6%) & Penicillins (19.2%). Less commonly used antibiotics included Cephradine (6.1%), Aminoglycosides (5.0%), Clindamycin (3 %), Tetracyclines (0.15%) & Vancomycin (0.76%). Mostly patients received more than one antibiotic (61.8%), while single antibiotic was given to only 38.1% patients. (Figure I)

Figure: I   Utilization of antibiotics
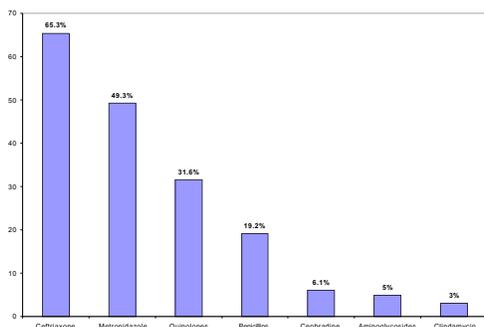
DISCUSSION

The excessive use of antibiotics has led to the emergence of bacterial resistance. The inappropriate and irrational use of antibiotics in clinical medicine is widespread, sometimes at inadequate dosages and often, for nonbacterial diseases. This is more evident in the indoor setting where the use of antibiotics is maximal.[20]

Our study confirms that 81.2% of total indoor patients received antibiotics regardless of the diagnosis and clinical presentation, which is comparable to a local study conducted at KTH Peshawar which showed a 78.7% antibiotic consumption. But, our figure is much higher than other parts of Asia, Europe or USA.[15-18] This percentage was 71.1% in Bangladesh [19], 45.8% in Bahrain, Jordan 60.9% [20], Sudan 63% [21] & 56.2% in Saudi Arabia.[22] In Africa, Zimbabwe had a rate of 29% while Malawi had a rate of 34% .[21] In the Middle East, Lebanon had a rate of 17.5% in a university health centre.[23] In Europe, Andorra had an antibiotic prescribing rate of 27% [24], while Central and South America, Ecuador and Guatemala had rates of 27%.[21] It shows the unnecessary and over use of antibiotics in our indoor hospital setting; wasting the limited resources on those who do not need them, while depriving the other needy patients at the same time.

In our study, the most commonly used drug was Ceftriaxone (65.3%). Much higher percentage was shown in India (82%).[30] Another study conducted at Bangladesh showed 30.2% consumption of ceftriaxone.[19] This much higher usage probably explains why ceftriaxone has abnormally high resistance.[25,26] Metronidazole consumption was 49.3% in our study, second highest, which is much higher than Thailand 9.7%.[27] Quinolones utilization was 31.6% which is more than utilization of quinolones at KTH Peshawar (9.7%).[28] The mean number of antibiotics prescribed per patient in our study was 1.80 which is comparable to most studies conducted in developing countries. This figure was 3.3 in Bahrain [29] which is the highest among many other countries. In the Asir region of Saudi Arabia, the mean number of antibiotics prescribed per patient was 1.44.[22] One study of 12 developing countries demonstrated that the mean number of drugs prescribed was 1.6.[21] In Lagos, Nigeria, however, the implementation of rational drug use policies produced a significant decrease in the number of drugs prescribed 10 years later.[25]

The limitation of our study was inadequate availability of antibiotics in the indoor pharmacy and policy of strict adherence to the available antibiotics. This study offers information on the trend of antibiotics used in a sample of admitted patients of SZH hospital based on patients records. A more detailed understanding of the problems related to hospital use of antibiotics should involve prescription data linked to patients data, particularly in terms of diagnosis and microbiological findings. Further studies are therefore needed using linkage techniques between pharmacy and medical records, also taking into account information about possible adoption of local guidelines or recommendations.

CONCLUSION

Polypharmacy, especially the use of multiple antibiotics, is a well-known potential risk factor in terms of patient's health. Multiple and unnecessary use of antibiotics should be regarded as a risk in terms of potential drug-drug interactions and emergence of resistant strains of bacteria, ultimately resulting in development of more and more potent and expansive antibiotics. We have analyzed current antibiotics used at the institution, and gathered baseline data, and found that there is high proportion of patients receiving multiple antibiotics in in-patient department of Sheikh Zayed Hospital, Rahim Yar Khan and local guidelines should be established for use these of antibiotics.

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