PRESCRIBING PATTERNS AND COMPARATIVE ANALYSIS OF ANTIBIOTICS IN GENERAL MEDICINE DEPARTMENT AT A TERTIARY CARE HOSPITAL, PEERANCHERU

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ABSTRACT

Antibiotics are the most commonly prescribed drugs in hospitals. Antibiotic resistance among pathogenic microorganisms is a matter of worldwide concern. The objective of this study is to determine the use of antibiotic Rational / Irrational use in a tertiary care hospital. This prospective study was carried out from in-patient as well as out-patient of General ward at a teaching hospital, Peerancheru. The study was carried out for a period of six to eight months from July 2017 to February 2018. In this study, 175 prescriptions were analyzed. Out of 175 prescriptions most of them were found to prescribe with more than one antibiotic. 70% of the prescriptions (125) were found to be rational and remaining 30% of prescriptions (50) was irrationally given The distributions of disease among 175 prescriptions are upper respiratory tract infection URTI, lower respiratory tract infection LRTI, and chronic obstructive pulmonary disease COPD, urinary tract infection UTI. In another study, antibiotics were commonly used in respiratory tract infection and urinary tract infections. Rational use of antibiotics gives positive response but irrational used increases the possibility of antibiotic resistance. So there is need of a clinical pharmacist to aid and evaluate prescriptions and to provide better patient care in all the health care units to give opinion to the physician in civilizing prescribing skills. In this study, Ceftriaxone and amoxicillin was commonly prescribed antibiotics. Amoxicillin (36%) was found to be the major resistant antibiotic followed by Ciprofloxacin (30%).

KEYWORDS: Antibiotics, Drug utilization, Internal Medicine ward, Bacterial resistance, Quality of life, Culture sensitivity testing, patient care.

INTRODUCTION

Antibiotics are the group of drugs used to treat infections caused by the microorganisms. It is necessary to remember that antibiotics acts against infection caused by the bacteria.[1] They do not act against infection caused by the virus and fungi. Excess and abuse of antibiotics increases the possibility of developing antibiotic resistance. Antibiotics are collectively grouped based on their mechanism of action. An antibiotic either kills the bacteria or inhibits its growth. Antibiotic which kills the bacteria are called as *Bactericidal* and the one who inhibits the bacterial growth called as *Bacteriostatic.* Categories of antibiotics include

Objective: To determine the use of antibiotic Rational / Irrational use in a tertiary care hospital along with its beneficial and adverse outcomes.

Penicillins: phenoxymethylpenicillin, flucloxacillin, amoxicillin

Cephalosporins: Cefaclor, Cefadroxil, Cefalexin, Cefuroxime

Tetracyclines: Tetracycline, Doxycycline, Clarithromycin, Clindamycin

Amino glycosides: Gentamicin, Tobramycin

Macrolides: erythromycin, azithromycin,

Sulphamethoxazole and Trimethoprim: Co-trimoxazole

Metronidazole and Tinidazole

Quinolones: Ciprofloxacin, Levofloxacin, Norfloxacin

The selection of infection depends on the type of infection and the bacteria responsible for the cause of infection. Antibiotic resistance develops if the bacteria are incompletely treated or not killed. This may occur if an antibiotic is stopped in mid-course. Overuse of antibiotics changes the structure of bacteria (mutating) and a gene is generated and bacteria transfer the genetic information in a horizontal fashion by plasmid exchange and develops resistance. Bacteria that are resistant to several antibiotics are called as Multi Resistant Organisms (MRO). Many studies verified the patterns of antibiotic practice and affecting the number of people in a wide range of population.[2] In severe infection, supportive care is considered as an intensive care. Antibiotic also destroy the normal bacteria present in the bowel and vagina. Many adverse drug events of antibiotics are not serious. Common side effects include soft

stools (feces), diarrhea, mild stomach upset, feeling sick, nausea and vomiting. Few patients may develop allergic reactions and some antibiotics interact with other medicines causing reaction or reducing the efficacy of drugs.

Antibiotics resistance can be prevent by minimizing the unnecessary prescribing of antibiotics, by completing the whole course of prescribed antibiotic and by keen good hygiene.[3]

Aprescribing the right drug in satisfactory dose for the sufficient time of period Rational use of drug can be done by growing awareness program, cost the drug, consumer protection act,[3] (CPA). Irrational means unnecessary prescribing the drug leads to other health hazards. Irrational use of drug occurs due to lack of information, inadequate training or education, demand from the patient,[4] promoting activities of the pharmaceutical industries, and ineffective drug regulation.

METHODS

A prospective study was carried out in the general ward at a teaching and general hospital, Peerancheru. The study was carried out for a period of six to eight months from July 2017 to February 2018. In this study 175 cases were analyzed in which 260 antibiotics were prescribed.

RESULTS

175 cases were prescribed with antibiotics; 75 (43%) were male and 100 (57%) were female. Total numbers of antibiotics prescribed were 260. Median duration of hospitalization was 5 days. The most common were amoxicillin, Metronidazole, ciprofloxacin and azithromycin. Culture and sensitivity testing was carried out in 50 patients. The common organisms isolated were *H. influenza, E. coli, K. pneumonia* and *S. aureus*. On assessing the results of study it was found that out of 260 antibiotics prescribed which accounted for 100%, Ceftriaxone indicated was 35% followed by Cefixime accounts for 12% of patients, Cefuroxime accounts for 5% of patients and Cefoperazone + Sulbactum accounts for 3% of patients. Ciprofloxacin was10 %, azithromycin was 6%, Erythromycin accounts for 4% of patients and Clarithromycin accounts for 3% of patients, Amikacin accounts for 2% of patients, Gentamycin accounts for 1% of patients and Streptomycin 1% of patients. Doxycycline 2% of patients, tetracycline accounts for 1% of patients. On assessing rationality, it was found that 125 (70%) prescriptions were rationality prescribed and 50 cases i.e., 30% had

irrationality. Amoxicillin (36%) was found to be the major resistant antibiotic followed by ciprofloxacin (30%).

DISCUSSION

Antibiotic resistance among pathogenic micro-organisms is a matter of worldwide concern. Unnecessary and inappropriate use of antibiotics contributes to the development of bacterial resistance.[5] Information of the antibiotic use and resistance patterns of common micro-organisms are lacking in the hospital. Therefore it is important to evaluate antibiotics usage to reduce occurrence of antimicrobial resistance which could be a foremost problem in mere future.[5] Among patients admitted to the hospital in General medicine ward, there was a frequency of patients of >59 years. This factor attributes prescribing of antibiotics in more to older patients because older patients are likely to get sick and have serious infection. Pediatric patients <12 years are not included in this study as they are admitted in pediatric medicine ward. Respiratory tract infection, urinary tract infection, gastro-intestinal infections were the most frequent conditions in our study. Majority of the antibiotics were prescribed in the treatment of RTI, UTI and Intra-abdominal infections.

It is preferable to maintain the number of drugs in prescription as low as possible to minimize the drug interaction, development of bacterial resistance & inexpensive for patients. Physicians were prescribing broad spectrum antibiotics rather than narrow spectrum antibiotics, though several antibiotic guidelines recommends to use narrow spectrum antibiotics to avoid bacterial resistance.[6] Ceftriaxone, Ciprofloxacin, Azithromycin and Amoxicillin were the most commonly prescribed antibiotics. Reduction of inappropriate use of antibiotics especially broad-spectrum agents is an important goal.[7] Quickening the availability of culture and sensitivity reports will facilitate in the selection of suitable antibiotic. Educational program and antibiotic order form may be useful idea to promote rational antibiotic use.[8] Rational use of antibiotics can be achieved by adjusting baseline prescribing, duration of intervention and prescribing narrow-spectrum antibiotics instead of broad-spectrum antibiotics. Specific principles of academic detailing include emphasizing effective techniques of patient-physician communication, using graphic materials, involving opinion and encouraging communications.[9] All these factors should be considered while developing a program to reduce irrational use of antibiotics and its resistance.

CONCLUSION

Antibiotic resistance is becoming a problem in the Internal Medicine ward. For the achievement of rational use of antibiotic to treat infections caused by microorganisms, culture sensitivity testing has a significant role in recognizing the organism and to select the appropriate antibiotic. Awareness programs should be launched and seminars should be conducted so as to minimize problems which are common at ward level. News Letters and Drug bulletins about the rational use of antibiotics should be releases periodically. Cost effective prescription should be encouraged. Formulation of a policy for hospital antibiotic use and educational programs especially for junior doctors also required.

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