Original Research Article

A prospective study on antibiotic prescribing pattern among in-patients of medicine department of a tertiary care hospital

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ABSTRACT

Background: Irrational prescription is a major contributor to the antimicrobial resistance. Tertiary care centres in a state are the centres of excellence where policies are framed. So, they have an important role in promoting rational antibiotic prescription.

Methods: The study was conducted on in-patients of medicine ward in government medical college, Calicut, for a period of 2 months (January to February 2018), The data was collected from IP case records of patients. The parameters checked includes appropriateness of the antibiotic as, to whether it is according to our hospital antibiotic policy, whether de-escalation and change to oral drug was done, whether it is prescribed by generic name, is it given as fixed drug combination (FDC), is it from national list of essential medicine.

Results: Among the 135-prescription analyzed, total 225 antibiotics were used. Cephalosporins (32%) were the most commonly used. Of this only 40% was given by generic prescription. 27% was FDCs. 55% was from national list of essential medicines and 69% of them were 'WATCH' drug according to WHO Antibiotic Policy. Regarding appropriateness of prescriptions around 56% included right drug, 93% had right dose and frequency, and 70% had right duration and 100% were given through right route.

Conclusions: Strict adherence to hospital antibiotic policy and plan for effective teaching programs regarding antibiotic resistance and importance of rational prescription of antibiotics can improve the quality of antibiotic prescription and minimize antibiotic resistance.

Keywords: Antimicrobial resistance, Hospital antibiotic policy, National list of essential medicines

INTRODUCTION

Antibiotics are one of the most commonly prescribed drugs in a hospital. It is said that about 1/3rd of the total prescription in a hospital is antibiotics and about 1/3rd of the antibiotic's prescription is usually irrational and about 1/3rd of hospital pharmacy budget is obtained from antibiotics. There are several challenges in rational use of antibiotics which starts from general lack of awareness, personal and environmental sanitation, to lack of surveillance methods for monitoring antimicrobial use, absence of a hospital antibiotic policy, and widespread use of antibiotics in poultry. Irrational use of antibiotics is a serious issue, which contributes to the emergence and spread of resistance.[1] The bacterial disease burden in India is among the highest in the world; consequently, antibiotics play a critical role in limiting morbidity and mortality in the country. This has led to increasing use of newer antibiotics and ultimately ended up with increased prevalence rates of multi-drug resistant bacteria.[2]

Antibiotic auditing and antibiotic stewardship are important tools to check and correct the irrational

antibiotic usage. This is gaining importance worldwide due to the emergence of widespread antibiotic resistance.[3] A variety of antibiotics are used in day to day clinical practice especially in Medicine wards, where severe bacterial infections are suspected. There are a number of studies conducted in other parts of the country to know about the prescription pattern of antibiotics in their hospital. So, we decided to conduct an observational study to identify the prescription pattern of antibiotics in the medicine ward in government medical college, Calicut. The aim of the study was to identify the prescription pattern of antibiotics in inpatients of medicine ward in government medical college, Calicut and to check the appropriateness of prescription by comparing with the hospital antibiotic policy. The knowledge of the prescription pattern will definitely help the clinicians to improve their prescription practices.

METHODS

Study design

The study design was prospective observational study

Study tool

Case records with antibiotic prescriptions of in patients of medicine wards were compared using hospital antibiotic policy

Study group

Patients admitted to wards in Department of General medicine wards of Government Medical College, Kozhikode during the period of January to February 2018. Sample size - 135.

Study was be conducted in Department of General Medicine, Government Medical College, Kozhikode. Duration of study from January to February 2018.

Inclusion criteria

Inclusion criteria were case record of all inpatients where antibiotics are prescribed. Those willing to give informed consent.

Exclusion criteria

Exclusion criteria were case records with no antibiotic prescriptions.

Obtaining informed consent - written informed consent was obtained from all participants.

Study procedure

After obtaining consent and ensuring confidentiality, the data was collected from IP case records of patients. The parameters checked includes appropriateness of the antibiotic, its dose, route, frequency, duration, whether it is according to our hospital antibiotic policy, whether de-escalation and change to oral drug was done, whether prescribed by generic name, is it given as fixed drug combination (FDC), is it in accordance with WHO antibiotic policy and is it from national list of essential medicine (NLEM). The data was entered in excel and analyzed using SPSS software.

RESULTS

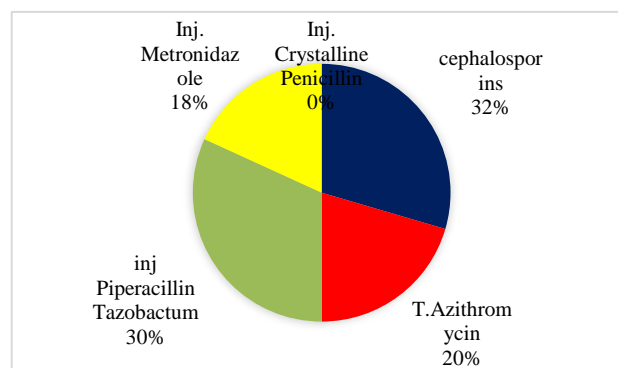Among the 135 prescriptions analyzed, total 225 antibiotics were used.

Figure 1: Percentage of various antibiotics prescribed.

Among the various antibiotics used, cephalosporins (32%) were the most commonly used of which cefotaxime (16%) was the commonest, followed by piperacillin-tazobactum and then by azithromycin and metronidazole.
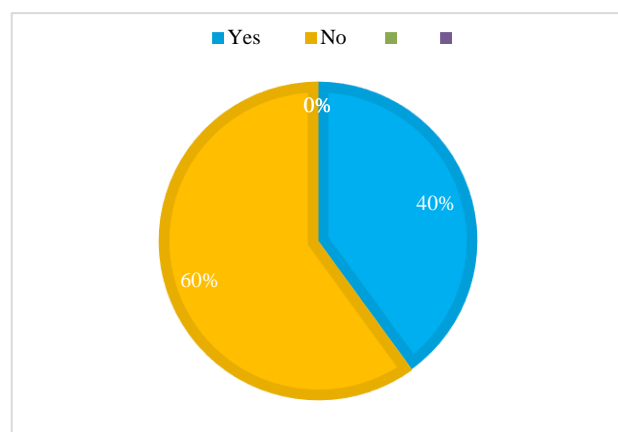

Figure 2: Percentage of generic prescription.

Among the prescription analyzed 40% was prescribed using generic name and 60% was prescribed using brand name.

Among the FDC, piperacillin-tazobactum, followed by cefaperazone-sulbactum were the commonest.

Based on WHO AWaRe (access, watch, reserve) classification of antibiotics, prescription of antibiotics was 30% from access list, 69% was from watch list and 1% was from reserve group.
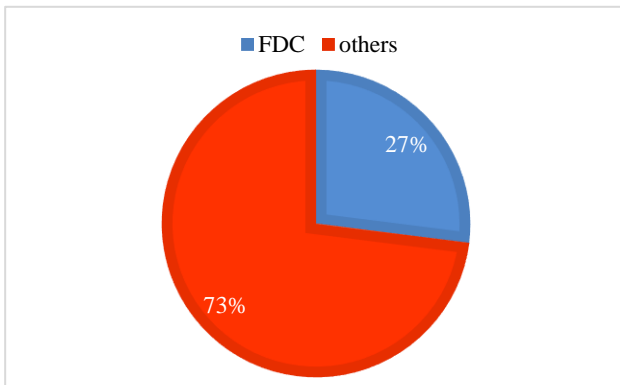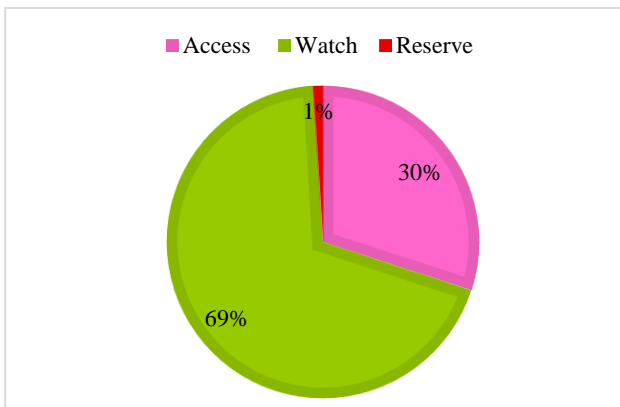

Figure 3: Percentage of FDC.

Figure 4: Percentage of antibiotics from WHO AWaRe group.
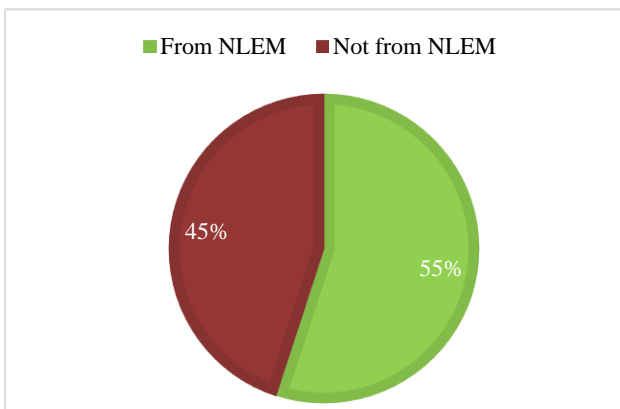

Figure 5: Percentage of antibiotics from national essential medicine list.

On analysis 55% of the prescribed antibiotics were from NLEM.

Analyzing the parameters to assess the appropriateness of antibiotic prescription in accordance with the hospital

antibiotic policy showed that 56% of prescription had appropriate drug in reference with the indication, 93% had correct dose, 71% had correct duration of therapy and 96% had correct frequency of therapy. De-escalation was done in 18% of cases.

Table 1: Parameters used to assess appropriateness of antibiotic prescription.

Parameters	Percentage of appropriate precription (%)
Drug	56
Dose	93
Duration	71
Frequency	96
Route	100
Deescalation done	18
Change to oral	72

DISCUSSION

A total of 135 prescriptions were analysed. This had a total of 225 antibiotics prescribed. On analyzing the various antibiotics, cephalosporins (32%) were the most commonly used, among which cefotaxime was the commonest (16%), followed by piperacillin-tazobactam and then by azithromycin and metronidazole. In a similar study conducted in a tertiary care hospital in eastern India, ceftriaxone (36.3%), co-amoxiclav, amikacin, vancomycin, and ampicillin were predominantly used.[4] In a study 25 hospitals across the country a similar result was obtained, i.e., ceftriaxone (24%), piperacillin-tazobactam (8%), and meropenem (8%) were the antimicrobials most frequently prescribed.[5]

On analysing for prescriptions which used generic names of antibiotics, 60% used brand names. In a similar study conducted in a tertiary care hospital in south Kerala, 90% of drugs were prescribed as brand names.[6]

On analysing the FDC of antibiotics prescribed 27% were given as FDCs. In the similar study in south Kerala 16.78% was FDCs.[6] Also, in a study conducted in another tertiary care centre in South India by Ahmed et al, 30.5% were FDCs.[7] On assessing the antibiotics prescribed from WHO AWaRe classification of antibiotics 30% was from access list, 69% was from watch list and 1% was from reserve group. This is a good indicator that physicians are aware of the importance of preserving reserve group antibiotics to tackle only multi-resistance cases.

Another indicator of good antibiotic prescription practice is that 55% of the prescribed antibiotics were from NLEM. This observation is similar to a study conducted at a medical college in North India by Kumar et al, were about 50% of antibiotics prescribed were from NLEM.[8] Analysing the parameters to assess the appropriateness of antibiotic prescription in accordance with the hospital antibiotic policy 56% of prescription had appropriate

drug in reference with the indication, 93% had correct dose, 71% had correct duration of therapy and 96% had correct frequency of therapy. De-escalation was done in 18% of cases. The choice of antibiotics needs to be improved which can be made possible by the strict implementation and timely update of hospital antibiotic policy. In a similar study in a teaching hospital in South India by Rajalingam, appropriateness of antibiotics was checked for indication (60.61%), duration (55.38%), dose (59.07%) and frequency (56.31%).[9]

CONCLUSION

Irrational drug prescribing leads to antibiotic resistance which further leads to prolonged hospital stay, increased mortality, and is a global threat. The control of antibiotic use requires a multidisciplinary approach involving physicians, microbiologists, pharmacologists and administrators and it is high time to act. A continuous process of education and monitoring is required to ensure rationality of antibiotic prescription.

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