(RESEARCH ARTICLE)

Assessment of antibiotics utilization in respiratory tract infections in teaching hospital

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Abstract

Background: Antibiotics are the main key drugs for treatment of respiratory tract infections (RTI) of both in upper respiratory tract infections (URTI) and lower respiratory tract infections (LRTI), and are among the most commonly prescribed drugs in adults. The caution use for anti-microbial agents (AMAs) is very important as their serious side effects, drug resistance and cost effectiveness can be life threatening. "In general drug utilization studies are carried out to identify appropriate usage of drugs in terms of medical, social and economical aspects.

Objectives: A prospective observational study was carried out for a period of nine months between Januarys to September 2018. The information was collected from the Department of General Medicine and Pulmonology Basaveshwara general and teaching hospital Kalaburgi (India).

Materials and methods: The prescription is chosen based on the inclusion criteria and the treatment follow-up until the patient discharge. During the study period the inpatient case records will be reviewed, which include antibiotics used and their dosage schedule, route of administration, dosage frequency & strength, date of discontinuation, generic name & bacteriological investigation. The information will document in the patient profile form. The data were analyzed by using online drug information like microdex, mediscap and data were present percentage calculation.

Results: The results showed that out of 80 patients enrolled in the study 39 (48%) were given both IV route and oral route, 38 (47%) were given only IV route, 3 (4%) were given by oral route of antibiotics. In our study found that the combination of antibiotics Ceftriaxone, Amoxicillin with Clavunate, Pipericillin with Tozabactum were found to be commonly prescribed. In 42 patients (52%) are prescribed on diagnostic report were as in 38 patients (47%) prescribed without diagnosis of RTIs.

Conclusion: The 20% of studied prescriptions founded prophylactic use of antibiotics combination. Thus special measures are imperative for their rational usage to prevent emergence of antibiotic resistance, serious side effects and cost effective treatment of poor economical patients. It can be concluded that it is mandatory to prepare suitable clinical guidelines for antibiotic prescriptions and usage rather than prescribing multiple and combination antibiotics.

Keywords: Antibiotics utilization; Respiratory tract infections; Prescription patterns; Teaching hospital

1 Introduction

Respiratory tract infection (RTI) is considered as one of the commonest public health problem dealt with in primary care. RTI is recognized as the leading cause of morbidity and mortality in many developing countries[1].The prescribing

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pattern deals with monitoring, evaluating and suggesting modifications in the prescribing pattern, so as to make a patients care, safety, effective and economical treatment. Irrational antibiotics usage has been widely reported from both developed as well as under developing countries[2,3].

Inappropriate use of antibiotics is a great public health concern because of its increased chances of development of antibiotic resistance in a community. The threat caused by injudicious use of antibiotics can be optimized by implementing appropriate use of antibiotics[4].

Prescribing of antibiotics in RTI, whether necessary or not, may also have collateral effects on microbial flora elsewhere in the body, notably the bowel. Thus, restriction of use or, conversely, over use may have beneficial or critical side effectson other diseases, such as urinary tract infection, via susceptibility patterns of associated pathogenic infections[5].

The population living in and around the Gulbarga city is highly surrounded by air pollution due to large industries such as cement and lime stone in addition each individual personal habit such as chewing tobacco and smoking. The population living in such an environment in everyday survival that exposed to traffic related air pollution, cement dust pollutions by cement factories and consumption of chewing tobacco and cigarette smoking habits are the more common factors inducing respiratory problems and associated with RTI's in adults. Our study with these factors we have planned to assess antibiotics utilization in the treatment of RTI's.

2   Material and methods

2.1   Study site

Department of General Medicine and Pulmonology at H K E'Society,s Basaveshwara General and Teaching hospital (BGTH), Sedam Road, Gulbarga.

2.2   Study duration

Study will be carried out for a period of nine months.

2.3   Study design

A prospective observational study.

2.4   Study criteria

2.4.1   Inclusion Criteria

- Patients who were referred and diagnosed with RTI.
- Respiratory tract infection RTI patients prescribed with antibiotics.
- Patients of either sex, above 18 years of age.

2.4.2   Exclusion Criteria

- Patient suffering with TB, Lung cancer, HIV infections and ICU patients.
- Patients below the age of 18 years.

2.5   Case Study procedure and data collection

The prescriptions are selected on inclusion, criteria and the treatment follow-up until the patient discharge. During the study period the inpatient case records will be reviewed. The antibiotics used and their dosage schedule, route of administration, dosage frequency and strength, date of discontinuation, generic name and bacteriological investigations. The information will document in the patient profile format. The data was analyzed by using subscribed sites microdex, mediscap and data was present in percentage calculation. In addition the in-patients case records will be reviewed which include antibiotics used and their dosage schedule, route of administration, dosage frequency and strength, date of discontinuation, generic name and diagnostic reports.

3   Results

3.1   Gender and age

Out of 80 patients 41(51%) were males and 39(49%) were females. 20 (25%) were in the age group of 18-30 yrs followed by 9 (11%) patients age between 31-40 yrs, 22 (27%) patients age between 41-50yrs and 29 (36%) patients age between 51yrs and above.

3.2   Occupation

In the patients of 33 (41%) were House wife followed by 19 (23%) were Agriculture, 12 (15%) were Students, 8 (10%) were Employée and 8 (10%) were Self empolyed.

3.3   Diagnose with type of RTI

With URTI is 35 patients (44%) and LRTI is 45 patients (56%)

3.4   Pathogenic organisms diagnosed

The organism identified in URTIs were *streptococus pyogenesis* in 30 patients (37%) and in LRTIs were *Streptococcus Pneumonia*is in 14 patients (17%), *Haemophilus influenza*in 12 (15%) and *Corynebacterium Diphtheriae*in 8 patients (10%).

3.5   Number of Antibiotics prescribes

In 35 patients (44%) were prescribed single antibiotic followed by combination (more than 1 antibiotic) is in 45 patients (56%).The patient between 18-30 years is 10 (12%) received mono therapy and 10 (12%) combination therapy, patients between 31-40 years 4 (5%) received mono therapy and 5 patients (6%) combination therapy, patient between 41-50 years 8 patients (10%) received mono therapy and 12 (15%) combination therapy followed by patients between 51 years and above patients receive 13 (16%) received mono therapy and 17 (21%) combination therapy.

Table 1 Diagnose Wise Distribution of Patients

Indication	Number of patients	Percentage
URTI	35	43.75%
LRTI	45	56.25%
Total number of patients	80	100%

Table 2 Pathogenic Organisms diagnosed

Organism diagnosed	Number of patients	Percentage
Streptococcus pyogenes (Strepthroat)	30	37.5%
Streptococcus Pneumonia	14	17.5%
Haemophilus influenza	12	15%
Corynbacterium diphtheriae	8	10%

Table 3 Antibiotic prescription on the basis of Diagnostic reports

Number of patients prescribed Antibiotics on the basis of Diagnostic reports	Percentage (%)	Number of patients prescribed Antibiotics without Diagnostic reports	Percentage (%)
42	52 %	38	47%

Table 4 Number of Antibiotic Prescribed Per Prescription (n = 80)

Age	Mono Antibiotics	Combination Antibiotics
18-30 Yrs.	10 (12%)	10 (12%)
31-40 Yrs.	4 (5%)	5 (6%)
41-50 Yrs.	8 (10%)	12 (15%)
51 & Above	13 (16%)	17 (21%)
Total number of patients	35 (44%)	45 (56%)

Table 5 Most Commonly Prescribed Antibiotics among Patients

Commonly prescribed Antibiotic	Type of Respiratory Tract Infections	Number of patients
Ceftriaxone	LRTI, URTI	28
Amoxicillin + clavulanate	LRTI, URTI	24
Pipercillin + Tazobactum	LRTI, URTI	22
Levofloxacin	LRTI, URTI	15
Cefotaxime	URTI, LRTI	11

Table 6 Condition of Patient at the Time of Discharge

Conditions	Number of Patients	Percentage (%)
Improved	62	77 %
Discharged against Medical advise	15	19 %
Referred	3	4 %

Table 7 Side effects observed in patients

Side effects observed in Mono Antibiotic prescribed	Side effects observed in Combination of Antibiotic prescribed
13 (35) %	19 (45) %

4 Discussion

The patients average length of hospitalize was four days and have observed that patient having age group of above 50 years had received more number of antibiotics. The pathogenic organisms diagnosed in our study were streptococcus pyogenes, streptococcus, pneumonia, Haemophilus influenza. Among the various groups of antibiotics, Cephalosporins were the most frequently prescribed antibiotic followed by Amino penicillin + Betalactama, Penicillin + Betalactamase, Quinolone,Cephalosporins + Betalactamase. In the usage of antibiotics in studied prescriptions revealed that ceftriaxone was the antibiotic commonly used to treat LRTI and URTI. Combination of antibiotic are prescribed on the basis of diagnosis and maximum contraindication are considered. The proper clinical advisory on rational usage of drug and an antimicrobial order form should be implemented in teaching hospitals to reduce the inappropriate therapy. Thus special measures are imperative for their rational usage to prevent emergence of antibiotic resistance consequently. The empirical therapy and antimicrobial usage for viral infection can be reduced by the availability of rapid diagnostic method to differentiate between viral and bacterial infection. From this study it can be concluded that it is mandatory

to prepare guidelines for antibiotic prescription and usage "the appropriate drugs for the disease rather than prescribing multiple drugs"

5   Conclusion

From these studies we concluded that the hospital provides advanced rapid diagnostic facilities for rational antibiotics utilization for minimize drug resistance, side effects and cost-effective treatments.

Compliance with ethical standards

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Disclosure of conflict of interest

We wish to confirm that there are no known conflict of interest associated with this study and there has been no significant financial support for this work that could have influenced its outcome.

Statement of ethical approval

The institutional review board which met on 27-03-2017 at HKES MTRIPS Kalaburagi to scrutinize the our dissertation research protocols has been accorded ethical clearance.

Statement of informed consent

Before collecting the patient data prepared the patient consent form and clearly explained about the objectives of the study and I know about my rights to withdraw the patient from the study at any point of time.

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