Research Article

Appraisal of Prescribing Patterns and Clinical Outcomes of Pneumonia in A Tertiary Care Hospital

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ABSTRACT

Pneumonia is a leading cause of illness and mortality in people of all ages around the world. The goal of this study is to look into the prescription patterns for pharmaceuticals or drugs used to treat pneumonia, as well as the clinical outcomes. The findings of the study will aid in the rational use of drugs in pneumonia patients. Objective of the study is to assess the prescribing patterns and clinical outcomes associated with Pneumonia in a tertiary care hospital. A prospective observational study was conducted for a period of 6 months in the various department of a tertiary care Super Speciality Hospital at malabar region of Kerala. The patients were selected based on Inclusion and Exclusion criteria. Out of 92 pneumonia patients studied, 48 (52%) patients were male and 44 (48%) were female. Majority of patients belongs to the age group <5years and least number was in the age group between 13 to 30 years. The most of the patients was found Bronchial pneumonia 45 (48.9%) patients and least was multi-lobar pneumonia 5 (5.4%) patients. Community acquired pneumonia was most of the samples. Many of the patients received antibiotics therapy 131 (27.8%). Average number of antibiotics per prescription was 1.42. Most commonly used Antibiotic was Cephalosporins 53 (41.2%) followed by Penicillin. Assessment of clinical outcomes are also measured. The study showed that pediatric patient and elderly patients were at higher risk of developing Pneumonia disease. Bronchial pneumonia is the most common type of pneumonia also patients with community acquired pneumonia were founded mostly as compared with other types of pneumonia. This study revealed that antibiotics and bronchodialator which were prescribed for the treatment of patient suffering from pneumonia.

Keywords: Pneumonia, Prescribing patterns, Rational drug use, Antibiotics, Infectious disease.

INTRODUCTION

Prescription auditing is an important tool that brings valuable information about drug status to medical profession, public health administration and society. Prescription order is an important transaction between the physician and patient[1]. Prescribing patterns study of drugs are helpful in exploring the commonly used groups of drugs, commonly used drugs in each group, drugs prescribed by generic or brand names by the physician[2]. Irrational prescription of drug is a common occurrence in clinical practice. Inappropriate, irrational and cost-ineffective uses of pharmaceuticals are worldwide phenomena especially in the developing countries. Drug is an important regimen for patient care management in health care settings. Prescriber and consumers flooded with vast of array of pharmaceutical products with innumerable brand names, available often at an affordable cost. More than 50% of all medicines worldwide are prescribed, dispensed, or sold inappropriately. Hence, a periodic auditing of drug utilization pattern has come necessary to promote rational prescribing. Good prescribing practice is prescribing the right drug at the right time, in the right dosage of the right formulation and for the right length of time [3]. Inappropriate use of drugs and dosage forms results in health hazard to the patient and cause financial burden. To avoid and overcome such problems each member of health system should practice rationally[4].

METHODOLOGY

The study was conducted at a tertiary care hospital at malabar region of Kerala and It is a prospective observational study with a period of 6 months that focused on prescribing patterns and clinical outcomes associated with Pneumonia in a tertiary care hospital. Inclusion and exclusion criteria were made based on the different patients admitted on the various departments of the hospital. Excluded the patients with malignancy disorders, psychiatric patients. All the patients from various departments were closely monitored throughout the period of study. Well-designed data collection form was used to collect and document the patient data, that describe the patients demographics, past medical and medication history, lab investigation, pharmacotherapy details and so on. All the cases were reviewed prospectively and monitored extensively.

RESULTS

Analyzing the estimated population of pneumonia patients, we found that the male patients (52%) were dominated over the female patients (48%) on causing

pneumonia. The most number of patients whose prescriptions were analyzed were under the age group of 01 - 05yrs (34.78%) which were followed by age group above 50yrs (30.43%). Pediatric patients were dominating in this group. Various types of pneumonia were taken into account before assessing the prescriptions such as bronchial pneumonia, aspiration pneumonia, lobar pneumonia, multi-lobar pneumonia. Among 92 patients selected, 45 patients (48.9 %) were found having bronchial pneumonia, 28 patients (30.4 %) were found having lobar pneumonia, 14 patients (15.2 %) were found as aspiration pneumonia, 5 patients (5.4 %) were found having multi-lobar pneumonia. And Among 92 patients, 90 patients (97.8 %) were Community acquired pneumonia and 2 patients (2.2 %) were Hospital acquired pneumonia (fig:1).
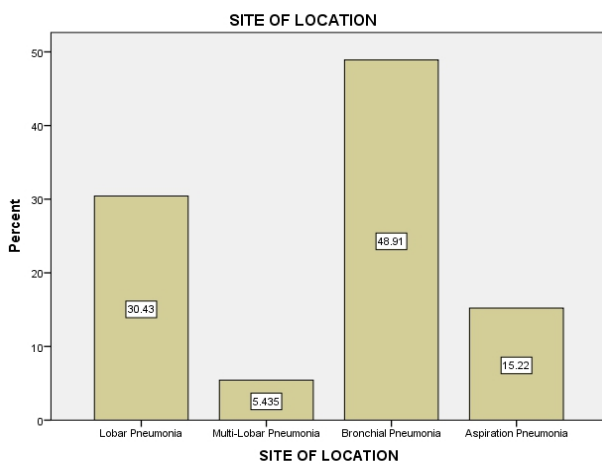

Figure 1: Site of Location

Among 92 patients analyzed, most of the patients showed breathing difficulty 90 patients (28.3%), almost 87 patients (27.3%) showed cough, 77 patients (24.2%) showed fever. 23 patients (7.2%) showed cold, 16 patients (5.0%) showed wheezing difficulties, 12 patients (3.7%) were having pleural effusion, 11 patients (3.4) were having mild chest pain and 2 patients (0.6%) were having previous pneumonia condition.

Antimicrobial resistance in bacterial pathogenesis is a worldwide challenge associated with high morbidity and mortality. Multi drug resistance patterns in Gram-positive and gram-negative bacteria have resulted in difficult-to-treat or even untreatable infections with conventional antimicrobial. Because the early identification of causative microorganisms and their antimicrobial susceptibility patterns in patients with bacterial pneumonia and other serious infections is lacking in many healthcare. Hence culturing the microorganism is necessary in order to isolate the microorganism and to find it's specific antibiotic in order to prevent the onset of antibiotic resistance. Among 92 patients, 20 patients culture sensitivity test showed organisms grown. *Streptococcus pneumonia* were isolated from 10 patients, *Klebsiella pneumonia* were isolated from 2 patients, *Staphylococcus haemolyticus* were isolated from 4 patients, *Pseudomonas aerginosa* were isolated from 4 patients. (fig : 2)
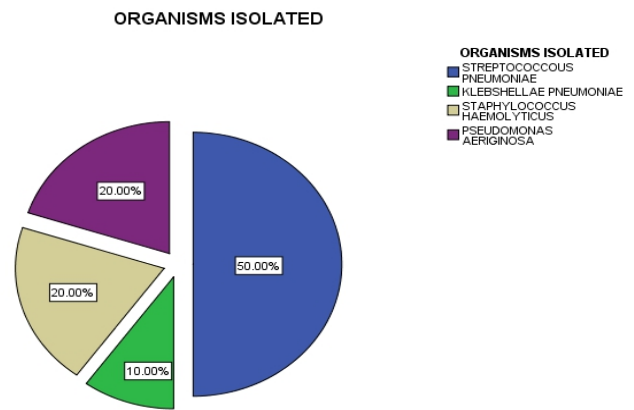

Figure 2: Organisms isolated

Among 466 drugs prescribed for 92 patients, 131 (27.8 %) Antibiotics were prescribed, followed by 87 (18.6 %) Bronchodialators prescribed, 34 (7.2 %) leukotriene receptor antagonists. Among 131 antibiotics prescribed in 92 prescriptions 53 (41.2%) drugs were cephalosporins antibiotics, 33 (24.4%) penicillin, followed by macrolides and aminoglycosides. (fig:3)
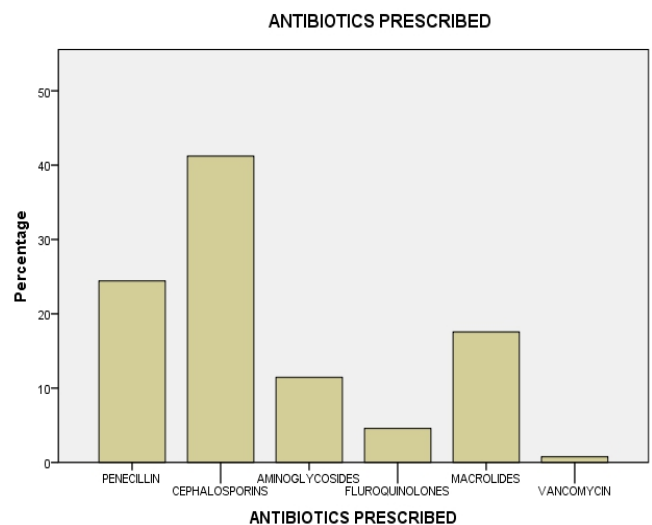

Figure 3: Antibiotics prescribed

The drug therapy was found to be almost 100% rational. All prescriptions were containing the right drug. A similar instance was there in case of dosage form, route and frequency of administration. Their accuracy was 96.7%, 97.8%, 95.6% respectively. The assessment of rationality was based on National Treatment Guidelines for Antimicrobial Use in Infectious Diseases, 2016.

In this study, certain drug-drug interactions were found. They were categorized into mild, moderate and major. Among 92 prescriptions, the drug interaction which was mild was found to be 55.5% and the moderate level drug interactions were found to be 27.8% and the major drug interactions were found to be 16.7%. (fig :4). It is evident from the clinical outcome generated that the antibiotic therapy has been effective and the symptoms, length of stay at the hospital has been reduced for majority of the

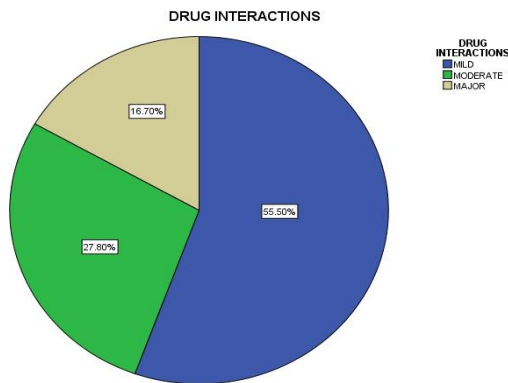patients. Also, improvements in laboratory parameters are achieved due to the antibiotic therapy. (fig: 5)

Figure 4: Drug interactions

Among 92 patients selected for the study, 20 patients had undergone the procedures for the isolation of organisms. From the isolated organisms, Streptococcus pneumoniae

were common organisms. Association between the organisms and length of stay clearly shows the relation, when the organisms were isolated length of stay also were increased. The p-value was below 0.05, therefore the result was statistically significant.
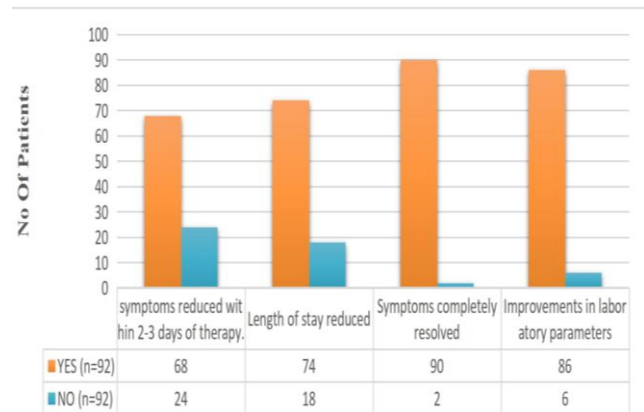

Figure 5

Table 1: Association between organisms and length of stay

Characters	1-3 Days	4-6 Days	7-9 Days	10-12 Days	P-value
Organisms isolated					
Streptococcus pneumoniae	0 (0.0%)	3 (30%)	6 (60%)	1 (10%)	0.001
Klebshellae pneumoniae	2 (100%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Staphylococcus haemolyticus	0 (0.0%)	2 (50%)	2(50%)	0 (0.0%)	
Pseudomonas aerginosa	0 (0.0%)	1 (25%)	2 (50%)	1 (25%)	

DISCUSSION

Prescribing patterns of drug is the study of drugs prescribed by the physicians, such studies are helpful in exploring the commonly used groups of drugs, commonly used drugs in each groups, drugs in each group, drugs prescribed by generic or brand names. It can be said that drug prescribing pattern studies can provide guidelines for establishing rational use of drugs. Irrational prescription of drug is a common occurrence in clinical practice, Inappropriate, irrational and cost ineffective uses of pharmaceuticals are worldwide phenomena especially in the developing countries.

Pneumonia is a single largest infectious cause of death in children worldwide. Pneumonia is form of acute respiratory infection that affects the lungs and also the most deadly communicable disease. we can prevent and treat pneumonia through vaccines, proper treatments, and healthy practices.

A Prospective observational study was carried out for a period of six month in various departments of tertiary care hospital in Perinthalmanna. The prospective method involves evaluating patients drug therapy in the inpatients and outpatients. The patients were randomly selected on the basis of inclusion and exclusion criteria. The study was carried out with a primary objective for the study of prescription pattern of drugs used in the treatment of

pneumonia, rationality of drugs therapy, drug interactions, medication errors. A total number of 92 cases were collected as per inclusion and exclusion criteria. All cases belongs to Pneumonia. The entire prescription and therapeutic management of pneumonia had crosse checked before analyzing the prescriptions.

On analyzing the 92 patient prescriptions, 48 (52%) patients were male and 44 (48%) patients were female. It found that male patients are affected with pneumonia than females. The most number of patients whose prescriptions were analyzed were under the age group of 01 - 05yrs (34.78%) which were followed by age group above 50yrs (30.43%). Pediatric patients were dominating in this group. Various types of pneumoniae were taken into account before assessing the prescriptions such as bronchial pneumonia, aspiration pneumonia, lobar pneumonia, multi-lobar pneumonia. Among 92 patients selected, 45 patients (48.9 %) were found having bronchial pneumonia, 28 patients (30.4 %) were found having lobar pneumonia, 14 patients (15.2 %) were found as aspiration pneumonia, 5 patients (5.4 %) were found having multi-lobar pneumonia. And Among 92 patients, 90 patients (97.8 %) were Community acquired pneumonia and 2 patients (2.2 %) were Hospital acquired pneumonia. Among 466 drugs prescribed for 92 patients, 131 (27.8 %) Antibiotics were prescribed, followed by 87 (18.6 %) Bronchodialators were prescribed, 34 (7.2 %) leukotriene receptor antagonists.

Among 131 antibiotics prescribed in 92 prescriptions 53 (41.2%) drugs were cephalosporins antibiotics, 33 (24.4%) penicillin, followed by macrolides and aminoglycosides. Among 466 drugs, 218 (46.8%) drugs administrated through Orally, followed by 149 (32.0%) drugs parentrally, 99 (21.2%) drugs nasal route. Among 466 drugs prescribed, 144 (30.9%) injectables were prescribed, followed by 131 (28.1%) tablets, 100 (21.5%) nebulisations, 79 (17%) syrups. The drug therapy was found to be almost 100% rational. All prescriptions were containing the right drug. A similar instance was there in case of dosage form, route and frequency of administration. Their accuracy was 96.7%, 97.8%, 95.6% respectively. The assessment of rationality was based on National Treatment Guidelines for Antimicrobial Use in Infectious Diseases, 2016. Assessment of clinical outcome was carried out during the patient monitoring. Improvement in the symptoms reduction due to antibiotic treatment has been monitored.

Also the length of stay in hospital was reduced due to the antibiotic treatment. The factors like gender, age and site of location of pneumonia are not statistically significant with antibiotics prescribed due to P-value was >0.05. The association between organisms isolated and length of stay, Association between dosage form and site of location of pneumonia are statistically significant due to P-value < 0.05.

A total of 466 drugs were prescribed to the study population. Among this 131 (27.8%) drugs were found to be antibiotic drugs. Average number of drugs per prescription was 5.06. Majority of drugs are given orally. The average number of antibiotic drugs were found to be 1.42.

CONCLUSION

Our study shows that antibiotics prescribing practices were globally sufficiently appropriate, But in certain aspects require closer investigation. In addition, from this study, we can understand that both men as well as women get the disease almost equally. The study showed that elderly and pediatric patients were at higher risk of developing pneumonia. Most pneumonia patients were found in the pulmonology department as well as most patients are admitted to the hospital for 4-6 days in the treatment period. Bronchial pneumonia is the most common type of pneumonia also patients with community acquired pneumonia were found mostly as compared with other types of pneumonia such as hospital acquired pneumonia and ventilator acquired pneumonia. Patients had more clinical presentation such as breathing difficulty, cough, fever. In this study, culture sensitivity tests were provided and a greater number of streptococcus organisms isolated in the pneumonia patients. This study revealed that antibiotics and bronchodilators which were prescribed for the treatment of patient suffering from pneumonia. In antibiotic classes the penicillin and cephalosporins were more commonly prescribed drugs. Most common prescribed drugs may administer through orally and parental route. In this study, if the drugs were more rational, it would have developed a more positive impact on the treatment and also drug related problems such as mild

to moderate drug interactions could have been avoided during the drug therapy. Assessment of clinical outcomes were measured with certain parameters. It is evident from the clinical outcome generated that the antibiotic therapy has been effective and the symptoms, length of stay at the hospital has been reduced for majority of the patients. Also improvements in laboratory parameters are achieved due to the antibiotic therapy.

These findings emphasized the need for appropriate management in pediatric and elderly patients to prevent the complication of pneumonia. Appropriate management and close monitoring is advised to improve the patients health.

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