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PRESCRIBING ASSESSMENT IN PEDIATRIC PATIENTS SUFFERING FROM PNEUMONIA IN TEACHING HOSPITALS OF HYDERABAD, PAKISTAN

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ABSTRACT

Introduction: Pneumonia is a type of acute respiratory tract infection (ARTI) of lower respiratory tract, characterized as the inflammation of lungs parenchyma in which there is fluid and pus in the alveoli resulting in difficulty in breathing and decreased quantity of oxygen exchange.

Objective: To assess the medications prescribed to pediatric patients suffering from pneumonia, their effectiveness and to verify that these medications are according to FDA and WHO guidelines.

Design: Purposive observational study

Method: Data was collected from the patient's medication record on predesigned questionnaire over a period of 6months in 2015. A total of 70 patients were enrolled. All of the collected prescriptions were evaluated for objectives on the basis of authenticated drug references and was keenly analyzed according to WHO and FDA guidelines. Patients of less than 18 years are included in this study regardless of gender.

Result: Out of 70 patients 66% were female and 34% were male. Most prescribed drugs were ceftriaxone and ampicillin. In 34.7% cases medication were changed after 3 days of therapy due to side effects, ineffectiveness and severity of disease. 27.5% of the cases were those who got alteration in their prescriptions due to ineffectiveness. 9% of the cases were reported with side effects of antibiotics. In 51 % of prescriptions the medication was according to FDA and WHO guidelines and 49 % were deviating from these guidelines.

Conclusion: Significant number of pediatric patients was having prescriptions deviating from FDA and WHO guidelines. Most prescribed drugs were ceftriaxone and ampicillin. In noticeable number of patients, therapy was changed due to ineffectiveness.

Keywords: Pneumonia, Prescription, Respiratory tract infection, Pediatrics

INTRODUCTION

Pneumonia is a type of acute respiratory tract infection (ARTI) of lower respiratory tract, characterized as the inflammation of lungs parenchyma in which there is fluid and pus in the alveoli resulting in difficulty in breathing and decreased quantity of oxygen exchange. This accumulated fluid, WBCs (to combat disease) and bacteria results in the opaque picture of lungs in X-rays, which is normally seen as a clear region. According to WHO pneumonia is febrile illness with tachypnea without any clear and obvious cause. Pneumonia can also be clinically defined in two ways as a bronchopneumonia is a febrile state accompanied with respiratory distress, cough with signs of patches on chest x-ray which is either generalized or localized and secondly lobar pneumonia is also very alike bronchopneumonia except that the radiographs and physical findings shows lobar consolidation [1] [2].

Viruses and bacteria are main cause of pneumonia. The most common causative agents are respiratory syncytial virus (RSV), Haemophilus influenza type b (Hib) and Streptococcus pneumonia [3] [4]. From the first two type of bacterial pneumonia, Streptococcus pneumonia is more frequent in the developing countries in the children below five years of age [4]. RSV is least common type than Hib, in the children less than two years of age. Streptococcus pneumonia along with other viruses are frequently present in upper respiratory tract mostly the nasopharynx then can enter into lungs resulting in disease. Bacterial pneumonia cannot be differentiated from the viral pneumonia on the basis of clinical findings [2].

The Lancet, a multinational independent research group of UNICEF and WHO, in its 2010data, which is the most recent data available, indicates that pneumonia accounts for majority of deaths in children [5].

Pakistan contributes as a top ranking country with death rate of seven million cases each year from pneumonia and 89 from every 1000 children die before celebrating their fifth birthday due to diarrhea and pneumonia [6].

Pediatrics ranges from birth till the age of 18years and exhibit as the significant population with 28% of total world's population [7].

Prescription assessment is the key to monitor the prescribed drugs are according to standard guidelines. Drug utilization assessment carries great importance in the medical field but the drug utilization data on pediatric patients is very limited because of various genuine reasons like ethical, mechanical and legal [7] [8]. The reasonable data of medicine is available for adults through clinical trials but not for children so the medications are prescribed to the children as off-label drug for which the prescription assessment plays an important role in monitoring the safety of these medications [9].

In the treatment pneumonia clinical, radiographic and laboratory findings are very important and should be taken in account. The selection of therapy or antibiotic is influenced by number of reasons such as child age, local epidemiological impact, sensitivity of pathogen, resistance, severity of disease and cost. In children, mostly these infections are viral in which antibiotic is not needed but it is equally crucial to select

rational antibiotic to stop further morbidity and deaths [2].

METHODOLOGY

A quantitative observational study was conducted by collecting the patient's data on predesigned questionnaire over a period of 6months in 2015. A total of 70 patients were enrolled via purposive sampling from Pediatric ward of different hospital of Hyderabad. All of the collected prescriptions were evaluated for objectives on the basis of authenticated drug references and was keenly analyzed according to WHO guidelines on pneumonia [1].

Inclusion & Exclusion criteria:

Patients of less than 18 years are included in this study regardless of gender.

All the adult patients, ICU emergency patient and Patients having HIV-AIDS, Hepatitis B & C, Pulmonary & Extra-pulmonary tuberculosis, Cancer, are excluded from study.

Table 1: Total number of patients and gender

Gender	Frequency	Percentage (%)
Male	24	34%
Female	46	66%
Total	70	100%

Table 2: Age groups

Age	Frequency	Percentage (%)
New born	5	7.1%
1day-28days	14	20%
29days-2years	35	50%
3years-11years	13	18.5%
12years-18years	3	4.3%
Total	70	100%

Table 3: Frequency of medication prescribed

Ceftriaxone	21%
Ceftazidime	5%
Cefixime	4%
Cefotaxime	13%
Ampicillin	26%
Ceftazidime and ampicillin	4%
Ceftriaxone and solucortef	6%
Meroneum	4%
Gentamicin and ampicillin	4%

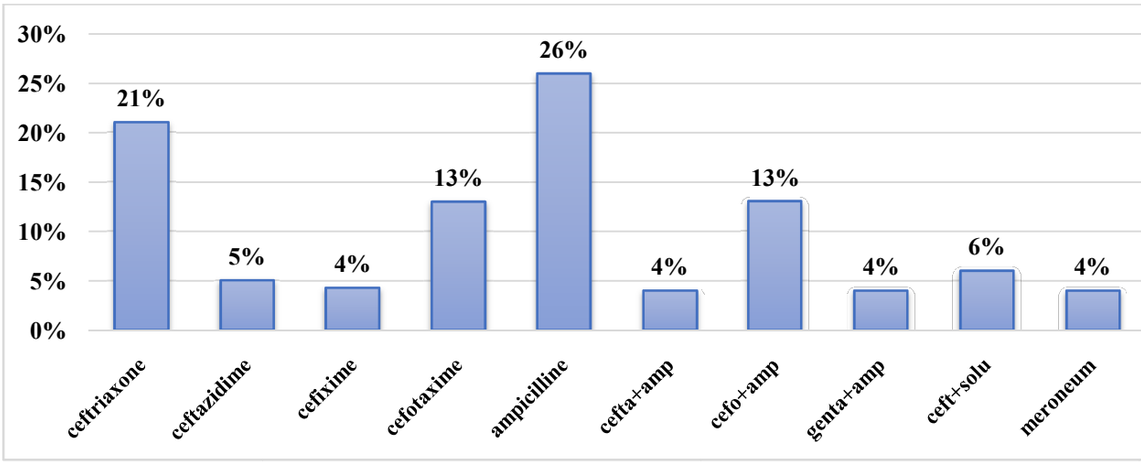

Figure 1: Frequency of medication prescribed

Table 4: Medication changed

Ceftazidime	Ampicillin+meroneum
Ampicillin	Ceftriaxone
Ampicillin	Meroneum+ampicillin
Ampicillin+gentamicin	Vancomycin+ceftriaxone
Meroneum	Vancomycin
Ceftriaxone+solucortef	Piperacillin Tazobactum + Solucortef

RESULTS

The data of 70 patients was collected in which 66% were female and 34% were male as shown in table 1.Most affected age group is infants and toddlers of 29days - 2 years as shown in table 2. Out of 70 patients 21% patients were prescribed ceftriaxone, 5% were prescribed ceftazidime, 4% were prescribed cefixime, 13% were prescribed cefotaxime, 26% were prescribed ampicillin, 4 % were prescribed combination of ceftazidime and ampicillin, 13% were prescribed cefotaxime and ampicillin combination, 6% were prescribed ceftriaxone and solucortef, 4% were prescribed meroneum and 4% were prescribed combination of gentamicin and ampicillin as shown in table 3 and figure A. In 34.7% cases medication were changed after 3 days of therapy due to side effects, ineffectiveness and severity of disease. 27.5% of the cases were those who got alteration in their prescriptions due to ineffectiveness as mentioned in table 4. 9% of the cases were reported with side effects of antibiotics. In 51 % of prescriptions the medication was according to FDA and WHO guidelines and 49 % were deviating from these guidelines.

DISCUSSION

Pneumonia is mostly common in the children with the age less than five years, undernourishment, crowded places, indoor pollution which may include tobacco smoke, poor environmental factors and with zinc deficiency. Healthy child has least chances of pneumonia as the body have natural defense mechanism [2] [4] [10] [11]. Same results are seen in this study that most affected age group of pneumonia is 29days – 2years with 50% out of total.

According to WHO and UNICEF data, pneumonia is the major cause of death in pediatric patients worldwide. Pneumonia and respiratory failure is responsible for the death of 1.3million children each year before celebrating their fifth birthday [12]. It is the single reason of death in children under the age of five as compared to malaria, AIDs and measles combined [10].

In two research conducted on this topic, identified five major risk factors for pneumonia ,which are low body weight, no breast feeding, lack of complete vaccination, overcrowding in bedroom and sibling (s) suffering from cough[2][13][14]. Main cause and agents for pneumonia cannot be recognized in 40% to 60% of patients [15][16].

According to guild lines, the standard therapy of antibiotics for the severe pediatric patients of pneumonia is established, in which first choice of drugs should be amoxicillin, benzyl penicillin, ampicillin or amoxicillin-Clavulanate. If these antibiotics are not effective and patient is febrile with high fever for about 48-72 hours then second line of therapy including Cephalosporins and third option is Carbapenem and other aminoglycosides should be considered. Pediatric patient with severe pneumonia must be given antibiotics parentally. Combination therapy of cephalosporin (second and third generation) and macrolides should be administered in severe cases [2]. But it was observed during this study that 49% of prescriptions are deviating from these guidelines.

Due to the wide spread occurrence of the disease there is also variation in the choice of antibiotics prescribed by the doctors. The finding of this study when compared to Sarah

S. Long's study published in the journal of pediatrics 2014, which reported that 75% of pneumonia children were prescribed third generation cephalosporin, which was not beneficial to the acute uncomplicated pneumonia, whereas in our study, 43% of pneumonia children were prescribed third generation cephalosporin alone. 5-10% was given macrolide only, which was also not effective for pneumonia, no any patient was prescribed macrolids in our study. Less than 1% were given ampicillin, which is the drug of choice for this condition.In contrast to this study, 26% were prescribed ampicillin alone and 17% were prescribed in combination with other antibiotics. The data comparison shows that prescribing pattern have been improved in past two years.

CONCLUSION

Results showed that significant number of pediatric patients was having prescriptions deviating from FDA and WHO guidelines but still there is an improvement in prescribing pattern as compared to 2014 data. In noticeable number of patients, therapy was changed due to ineffectiveness.

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