



A STUDY ON PRESS BASED SEVERITY ASSESSMENT & DUE OF RESPIRATORY TRACT INFECTIONS IN PAEDIATRICS IN A TERTIARY CARE HOSPITAL

Pharmaceutical Sciences

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ABSTRACT

RTI is the leading cause of death in children in the world (11.9 million per year) with the greatest number of deaths occurring in developing countries. Considering the prevalence of RTI, the use of an objective measure of severity of respiratory illness would have implications in clinical management as well as clinical research. So, it is crucial to treat respiratory infections appropriately to avoid risk of respiratory failure, which is fatal in children. Hence PRESS scoring system may help to assess and classify respiratory illness. And also the rational drug use is one of the main concerns of the health care system in India. Paediatric population being more vulnerable require additional focus to achieve this goal. Thus this study is also meant to evaluate the prescription patterns of RTI according to WHO guidelines and Drug use core indicators. The main aim and objectives of the study is to analyze the overall utilization pattern of medicines and compare them with standard guidelines, differentiate the URTI & LRTI outcomes in patients. And to assess the severity of RTI in paediatric population using Paediatric respiratory severity score (PRESS).

KEYWORDS

Lower respiratory tract infections, Upper respiratory tract infections, Paediatrics, PRESS

INTRODUCTION

RESPIRATORY TRACT INFECTIONS

Respiratory tract infections refers to any of the infectious diseases involving the respiratory system (1,2). It is classified into 2 types they are;

- UPPER RESPIRATORY TRACT INFECTIONS
- LOWER RESPIRATORY TRACT INFECTIONS

UPPER RESPIRATORY TRACT INFECTIONS

Upper respiratory tract infections (URTI) are the illness caused by an acute infection which involves the upper respiratory tract; that are, sinuses, middle ear, pharynx, larynx etc. It include otitis media, sinusitis, pharyngitis, laryngitis, rhinitis, epiglottitis.^(1,2)

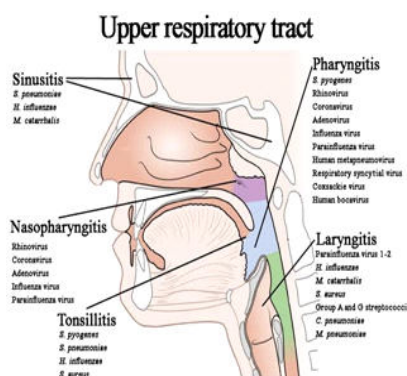


Figure:1

LOWER RESPIRATORY TRACT INFECTIONS

Lower Respiratory Tract Infections can be defined as the inflammation of the air passages within the lungs. It involves trachea (windpipe), and the large and small bronchi (airways) within the lungs become inflamed because of the infection. The infections of the Lower Respiratory Tract which includes Bronchitis, Bronchiolitis and pneumonia.^(1,2,3)

EPIDEMIOLOGY

Globally, the incidences of LRTIs among children under 5 years of age have been observed to be 12,197.8 new cases per 100,000 children.⁽²⁾

Lower respiratory tract

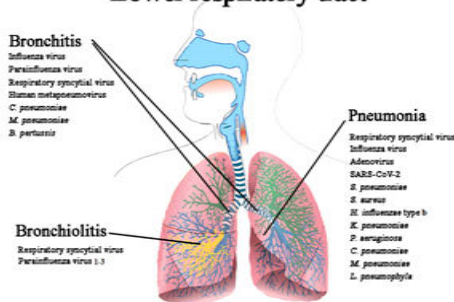


Figure:2

DRUG USE EVALUATION

WHO defines Drug use evaluation (DUE) as an ongoing, systematic criteria based program of medicine evaluation that will help to ensure appropriate medicine use. If the therapy is determined to be inappropriate, interventions with providers or patients will be necessary to optimize pharmaceutical therapy. This terminology is similar to that Drug use review (DUR) and Medication utilization review (MUR).^(1,5)

The designed study involves a comprehensive review of patient's prescription and medication data before, during and after medication dispensing in order to assure appropriate therapeutic decision making and positive patient outcomes. (1)Other advantages of these studies include:

- Creation of a comprehensive medico-socio-economic background for decision making in healthcare.
- Rationalization of drug use.
- Detection and prevention of adverse effects, drug interactions and toxicity.
- Provision of performance feedback to physician and other stakeholders.
- Designing educational programs that would eventually lead to improvement in prescription.⁽¹²⁾

TYPES OF DUE

Quantitative DUE: are concerned with quantifying various facts of

drug therapy use within health care. Qualitative DUE: compare drug use or practice with predetermined standard or criteria. (1).

Need for DUE

The inappropriate medication use patterns in the form of irrational prescribing, unwanted multidrug regimens, and disproportionate dosage decreases the effectiveness of therapy, increases incidence of the adverse effects and heightens cost of the medical care. Therefore, it is imperative to assess the prescribing pattern of physicians periodically to identify any defects and undertake effective corrective measures.(5,1)

DUE CYCLE:

It includes mainly seven steps:

- Planning
- Data collection
- Evaluation
- Feedback and results
- Intervention
- Re-evaluation
- Feedback and results



Figure:3 DUE Cycle (1)

Objectives of DUE include the following,

- Ensuring that the pharmaceutical therapy meets its current standard of care.
- Promoting optimal medication therapy.
- Preventing medication related problems.
- Identifying specific medicines use problems that require further evaluation.
- Creating criteria for appropriate medicine use
- Enhancing accountability in the medicine use process.
- Controlling pharmaceutical cost.(1)

PEDIATRIC RESPIRATORY SEVERITY SCORE

Acute respiratory infections (ARIs) are commonly found causes of morbidity and mortality in children. The pediatric respiratory severity (PRESS) score is a simple severity scoring system. Healthcare providers can apply it as a preliminary patient assessment for proper treatments. Based on many reviews, the PRESS score is an easy and simple method for assessing a patient.(10)

PRESS score is a severity assessment score to categorize patients with respiratory infections into 3 groups: mild (0 - 1), moderate (2 - 3), and severe (4 - 5) based on five parameters: respiratory rate, wheezing, accessory muscle use, SpO₂, and feeding difficulties. Each parameter has either a score of 0 or 1, where 1 is present, and 0 is otherwise. And summation of these parameters classifies the group of the patient. When the classification identifies condition as severity, this consequently indicates a proper treatment with urgency. Thus, patients can be treated promptly and appropriately.

According to the above given table, each features is assessed and scoring is done either 1 or 0. In case of respiratory rate, age group has to be analyzed before providing a score and finally the sum of these five characters decides the score for a paediatric patient and review whether the condition is severe or not.

Table:1 PRESS scorings system⁽⁹⁾

Score Component	Operational definition		Scoring
Respiratory rate	Respiratory rate at rest, on room air*		0 or 1
Wheezing	High-pitch expiratory sound heard by auscultation		0 or 1
Accessory muscle use	Any visible use of accessory muscles		0 or 1
SpO ₂	Oxygen saturation <95% on room air		0 or 1
Feeding difficulties	Refusing feedings		0 or 1
	Sum of five components		
PRESS score	0-1: mild 2-3: moderate 4-5: severe		0-5
Criteria of tachypnea*	Month	Respiratory rate	
	<12	60<	1
	12≤, <35	40<	1
	36≤, <156	30<	1
	156≤	20<	1
*Respiratory rate evaluated according to American Heart Association guideline. PRESS, Pediatric Respiratory Severity Score			

MATERIALS AND METHODS

A prospective observational study was conducted in a 450 bedded tertiary care hospital. Study was conducted in a 450 bedded tertiary care hospital. The study was carried out for a period of six months. The Inclusion criteria included In-patients of paediatric department with respiratory tract infections, Patients of either sex will be included, Patients of age 0-15 years. The Exclusion criteria included Paediatrics out patients, Patients from department other than paediatrics department, Patients who are not willing to participate in the study.

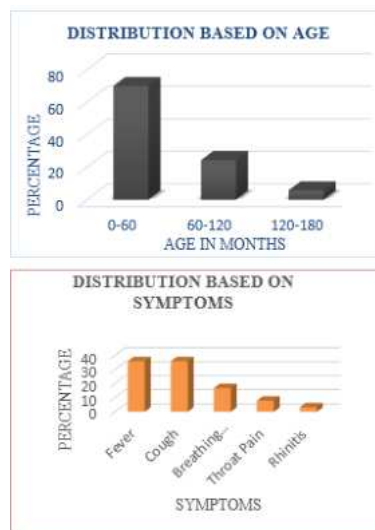
DATA COLLECTION AND ANALYSIS: Patient's demographic details, current complaints, current drugs prescribed, drug interactions, adverse drug reactions, laboratory values, diagnostic tests were collected in specially designed data entry form during ward rounds. All case charts were analyzed to assess severity and to classify RTI using PRESS. Prescribing patterns and drug utilization in patient were reviewed.

The documented data was analyzed by simple statistical measures and result was shown by graphical method and using chi-square test statistical analysis.

RESULTS

DISTRIBUTION OF PATIENS BASED ON AGE: The study depicts that, the age group between 0-60 months have high incidence rate for respiratory tract infections (86) with 69.9% followed by 60-120 months (30) with 24.4% and 120-180 months (7) with 5.7% respectively.

DISTRIBUTION BASED ON SYMPTOMS: In the present study the paediatrics patients with respiratory tract infections was admitted mostly with fever (110 and cough (110) as primary symptoms with 36%. The other symptoms were breathing difficulty (51) with a percentage of 16.7, Throat pain (24) with 7.8%, Rhinitis (10) with 3.2%.



Figures:4,5

DISTRIBUTION BASED ON DIAGNOSIS: From the current study, we understood that the most of the paediatric patients were diagnosed with lower respiratory tract infections with a total number of patients having LRTI-103 and Upper respiratory tract infections 20 with a percentage of 83.7 and 16.2 respectively.

DISTRIBUTION BASED ON CLASS OF ANTIBIOTICS PRESCRIBED: In the study, most commonly prescribed class of antibiotics were cephalosporins (119) and aminoglycosides (119) with a percentage of 44.7 each. The next mostly prescribed antibiotic is penicillin (21) with a percentage of 7.8 followed by macrolide antibiotic (7) with a percentage of 2.6.

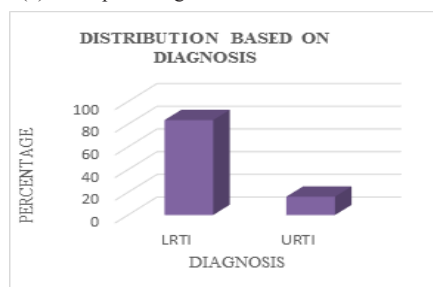


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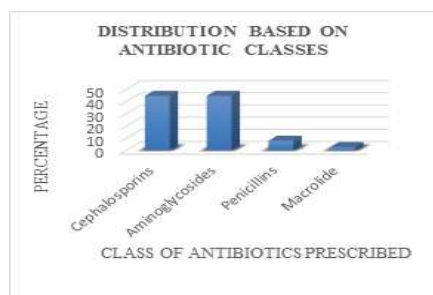


Figure:7

DISTRIBUTION OF SEVERITY OF RESPIRATORY TRACT INFECTIONS BASED ON PRESS SCORING: PRESS scores are a severity assessment score to categorize patients with respiratory infections into 3 groups: mild (0 - 1), moderate (2 - 3), and severe (4 - 5) based on five parameters: respiratory rate, wheezing, accessory muscle use, SpO₂, and feeding difficulties. Each parameter has either a score of 0 or 1, where 1 is present, and 0 is not present.

According to the PRESS based assessment of the severity of respiratory tract infections in paediatric patients of sample size 123, mild cases were more in 52 patients with 42.3%, then moderate cases of RTI in 46 patients with a percentage of 37.4% followed by severe cases in 25 patients with 20.3%.

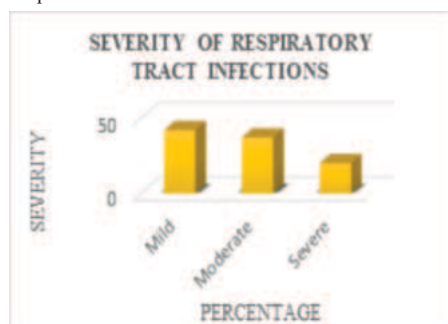


Figure:8

DISTRIBUTION BASED ON NO. OF DAYS OF HOSPITAL ADMISSION AND SEVERITY OF RTI: From this study we understood that as the severity of the disease increases, the no of days of hospital stay, increases. The patients in the severity category according to PRESS has been admitted for a period of 9-11 days.

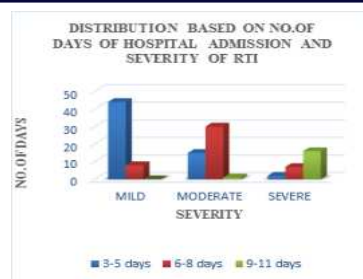


Figure: 9

DISTRIBUTION OF SEVERITY OF RESPIRATORY TRACT INFECTIONS IN RELATION TO AGE: In this study the mild cases of RTI was more in age group of 0-60 months followed by 60-120 months, and then 120-180 months. Like wise moderate cases of respiratory tract infections were also mostly reported in age group of 0-60 months and then 60-120 months followed by 120-180 months of age. Severe cases of RTI was also more in 0-60 months then in age group of 60-120 months followed by 120-180.

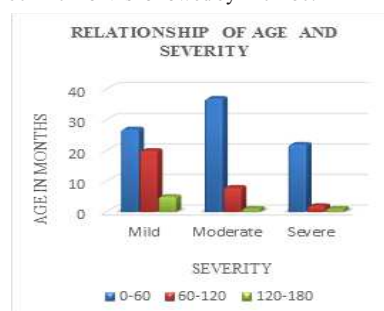


Figure:10

DETERMINATION OF P VALUE : The, P value was found to be <0.001** ($\chi^2=14.736$, d f=4, p=0.001**) and the level of significance is 0.05. The result is statistically significant.

DISCUSSION

A Prospective observational study was carried out for a period of 6 months in the paediatric department of a 450 bedded tertiary care hospital to assess the Drug Utilization Pattern and severity of Respiratory Tract Infections in paediatrics. The patients were selected based on the inclusion criteria of the study. The study included 123 patients. The data was collected in specially designed data entry form and these data were organized, analyzed, and tabulated. The severity of the respiratory tract infections was assessed using PRESS and the DUE was done on the basis of the WHO indicators. The results were reported both graphically and statistically. Significance of the study was calculated using Chi-square test. In this study increased number of respiratory tract infections was found in the age group of 0-60 months. RTI was reported more in males (54.4%) than in females (45.5%). The common symptoms with which the patients were presented with are fever and cough, and other symptoms were breathing difficulty, throat pain and runny nose.

The drug utilization pattern showed that antipyretics and antibiotics were the most commonly prescribed drugs followed nasal decongestants. The common antibiotics prescribed were ceftriaxone and amikacin. Monotherapy was most utilized in patients with respiratory tract infections.

The other different categories of drugs prescribed was corticosteroids, antivirals, antacids, nutritional and mucolytics. The most common nebulization therapy provided for the patients were neb. Asthalin. All categories of drug interactions were reported in which moderate interactions were more in number. No ADR was reported during this study. According to PRESS, as the severity of the condition increases, the days of hospital stay increases. It is also found that severity increases with decrease in age.

Thus this study concluded that PRESS score can be a useful respiratory scoring system in triaging the children at the time of admission and in predicting the requirement of respiratory support and duration of

hospital stay and might be a good guide for a proper treatment of respiratory infection in children.

CONCLUSION

The findings of the study would lead to a suggestion that, rational use of antibiotics is needed for the factual treatment of Respiratory Tract Infections. There is a need for microbiological analysis before treatment with antibiotics along with non-anti-infective class of drugs and nutritional supplements. So a well advised use of drugs in RTI would help in providing better patient management and limiting the morbidity and mortality rates especially in children.

The study with PRESS based severity assessment, concluded that PRESS score can be a useful respiratory scoring system in triaging the children at the time of admission by medical staffs and in predicting the requirement of respiratory support, immediate therapeutic interventions and duration of hospital stay and might be a good guide for a proper treatment of respiratory infection in children.

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