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Prescribing Patterns of Antibiotics in Respiratory Tract Infections in Pediatrics

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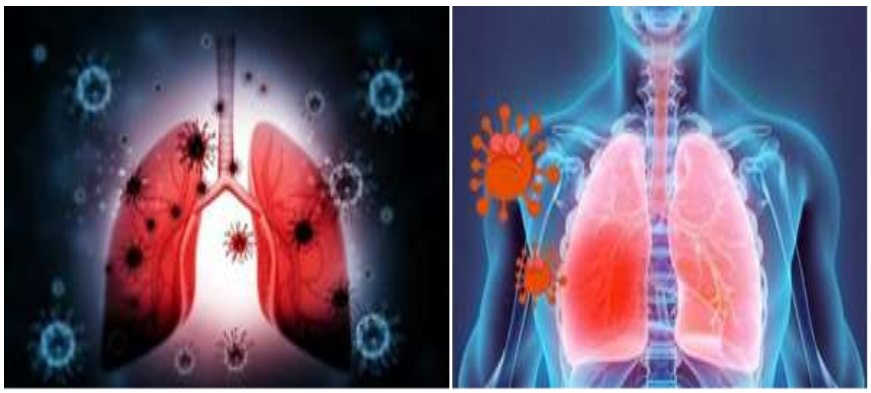
ABSTRACT:

More people than any other organ in the body experience acute respiratory tract infections (ARTIs). Acute respiratory infections in children, albeit common in all age groups, represent a major public health concern globally, especially in India. Upper respiratory tract infections include sinusitis, ear infections, laryngitis, epiglottitis, tonsillopharyngitis, and acute pharyngitis. Examples of LRTIs include epiglottitis, laryngitis, laryngotracheitis, pneumonia, and bronchitis/bronchiolitis. Acute respiratory tract infections (ARTIs) are commonly characterised by fever, rhinorrhea, cough, sore throat, ear ache, and dyspnea. There are more symptoms as well as a body discomfort.

Keywords: upper respiratory tract infection, lower respiratory tract infection, paediatrics, prescriptions, Antibiotics.

INTRODUCTION:

Humans are more likely than any other animal to get infections of the respiratory tract (ARTIs). Children's acute respiratory infections, especially those in India, are a major worldwide public health problem even though they are common in all age groups. Pneumonia in particular is one of the main causes of morbidity and mortality in the paediatric age range. According to a 2006 UNICEF assessment, ARTIs—specifically, pneumonia—were linked to 20% of mortality in children under five.[1]



Upper respiratory tract infections include common cold symptoms such laryngitis, acute pharyngitis, tonsillopharyngitis, rhinitis, sinusitis, and ear infections. While viruses account for most URTIs, these infections can also increase a child's risk of bacterial infections. Of the URTIs listed above, group A beta hemolytic streptococci-induced pharyngitis can culminate in rheumatic fever, a potentially lethal condition, and ear infections can cause deafness. Pneumonia, bronchiolitis, laryngitis, laryngotracheitis, epiglottitis, and bronchitis are examples of LRTIs. [2,3,4]

Paediatrics is the branch of medicine that deals with the conditions, issues, and growth of young patients. The early years are characterised by rapid growth and development. Medication treatment is seen to be an essential component of paediatric care in hospitals and other healthcare institutions. [5]

Most episodes are caused by viruses, and in otherwise healthy people, these conditions often go away on their own without the need for a prescription medication or a trip to the doctor. But many individuals with simple, self-limited ARTIs go to the ED or primary care physician (PCP), increasing healthcare costs and sometimes leading to the wrong antibiotic or antiviral drug being prescribed.[6,7]

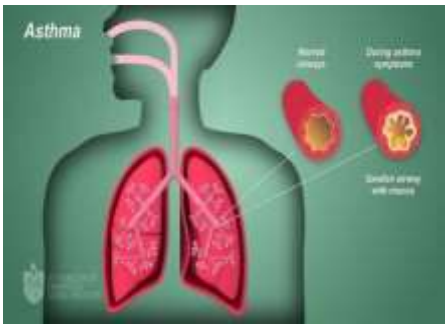
Sequential consideration of the illness symptoms can assist concentrate the differential diagnosis and speed up specific diagnosis and treatment when a patient is suspected of having a respiratory infection. The basis is an elementary knowledge of the pathophysiology of the respiratory tract and the ways in which microbial infections interact with the immune systems, both acquired and innate.

A fundamental understanding of the pathophysiology of the respiratory tract and the mechanisms by which microbial pathogens interact with the innate and acquired immune systems serves as the foundation. The physician proceeds to discuss the patient's medical history, the conditions surrounding the infection, and the clinical syndrome that is being evaluated.

This information serves as a guide for laboratory testing. imaging in addition to obtaining any further data needed to provide a final diagnosis and treatment recommendation. In this chapter, significant RTI-related concepts are summarisedwith an emphasis on any aerosolized fungus, viruses, and bacteria that may be contaminating the environment, as well as the microbiological and clinical aspects of the air on a daily basis. Moreover, unintentional microaspiration of the stomach and/or oropharynx happens regularly in healthy individuals and is a major concern in critically sick patients on mechanical ventilation. [8]

Diseases in respiratory tract infections Asthma

A chronic inflammatory condition of the airways, asthma is characterized by recurring bouts of wheezing, dyspnea, chest tightness, and coughing.. Most of the time, the condition may be cured on its own or with medical assistance. Many terms, including wheezy bronchitis, allergic or asthmatic bronchitis, and intrinsic and extrinsic asthma, are often used in clinical practice



Pneumonia

Pneumonia is a lung disease that affects the lung alveoli, or air sacs, and is caused by a variety of microorganisms, including bacteria, viruses, and fungi. An infection of the alveoli, the tiny air sacs in the lungs, and the tissues around them is known as pneumoniaIt is one of the main causes of death worldwide. When a patient develops pneumonia, other serious chronic illnesses often come to an end.[9]

Bronchitis

Pneumonia is defined as swelling and inflammation of the airways, or the tubes that connect the lungs and windpipe. It causes inflammation and swelling of the airways.

When you have acute bronchitis, you often feel discomfort behind your breastbone and spit up mucus when you cough or take heavy breaths.[10].

Common cold

Other common viruses that cause common colds include parainfluenza, respiratory syncytial, corona virus, adenovirus, echovirus, coxsackievirus, and rhinovirus. The rhinovirus is the cause of up to 60% of infections. The etiological agents are influenced by the host's age and the season. Among the symptoms include throat soreness, nasal discharge, and nasal obstruction. Lethargy, sneezing, purulent nasal secretions, and a low-grade temperature are usually present along with this. The symptoms are non-specific and do not correlate with any single agent. Usually, the symptoms persist for seven days.[11]

The majority of children's common colds go away on their own, therefore in most cases, no additional therapy is required.

The course or result of the illness are unaffected by the use of antibiotics. On the other hand, employing antibiotics increases the risk of resistant microorganisms colonising, which makes them potentially harmful. This might render a subsequent bacterial infection resistant to widely used antibiotics. [12]

Sinusitis

Sinusitis is defined as inflammation of the mucosal lining of one or more paranasal sinuses. [13]

Even with basic viral upper respiratory infections such as the common cold, there is inflammation and congestion of the sinus and nasal mucosa. Therefore, the proper categorization for these disorders is rhinosinusitis.[14]

This inflammation goes away on its own for most people. Acute sinusitis is thought to occur in 0.5–10% of cases of upper respiratory infections.. Using appropriate diagnostic criteria is important since only a small percentage of children presenting symptoms of rhinosinusitis may be attributed to bacterial aetiology. since doing so will prevent antibiotic overuse.

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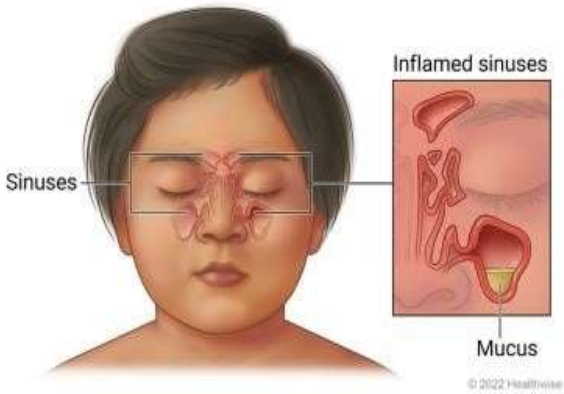


Otitis media

Otitis media, sometimes referred to as inflammation or middle ear infections, is a very common ailment, especially in young children. The sinuses, mastoid cavities, and middle ears are connected to the nasopharynx. A common pathogenesis of otitis media is eustachian tube obstruction, which results in fluid retention and suppuration. The aetiology of chronic disorders may involve the formation of bacterial biofilms. [16]

PATHOPHYSIOLOGY OF RESPIRATORY TRACT INFECTIONS

Similar to other infectious diseases, RTIs are brought on by a complex interplay between the pathogen's capacity to invade, infect, and harm tissues and the host's capacity to mount an effective defence against it. The primary function of the respiratory system is to exchange gases between inspired air and blood in circulation. An individual typically breathes in around 28,000 breaths of air per day, along with any aerosolized bacteria, viruses, or fungus that could be contaminating the atmosphere. Furthermore, inadvertent microaspiration of the stomach contents and/or oropharynx occurs often in healthy people and is a serious risk factor for critically ill patients receiving mechanical ventilation. [17]

Risk Factors

Environmental risk factors have a major impact on the incidence of respiratory tract infections in children.

The greatest risk factors are living in cramped quarters, air pollution, undernourishment, low birth weight, nonexclusive breastfeeding (especially in the first four months after delivery), and not having had a measles vaccine for infants under one year of age.

The most important risk factors with established effects include concurrent diseases (e.g., asthma, diarrhoea, heart disease, etc.), mother's experience as a carer, zinc deficiency, and parental smoking.

Finally, there may be other risk factors, such as the mother's educational status, creche attendance, cold, humid weather, vitamin A deficiency, and outdoor air pollution. [18]

METHODOLOGY:

To find out how often antibiotics were used in tertiary hospital patients with respiratory infections, a prospective observational research was conducted.

fundamental statistical data, specifics of acute morbidity, and an estimate of how long antibiotics will work on youngsters.

INCLUSION CRITERIA

- Children aged under 12 years old.

- Children diagnosed with Respiratory tract infection

EXCLUSION CRITERIA

- Children from the out patient department of pediatric.
- Children with other systemic illness.

Microbes responsible for URTIs and the treatment guidelines in children.

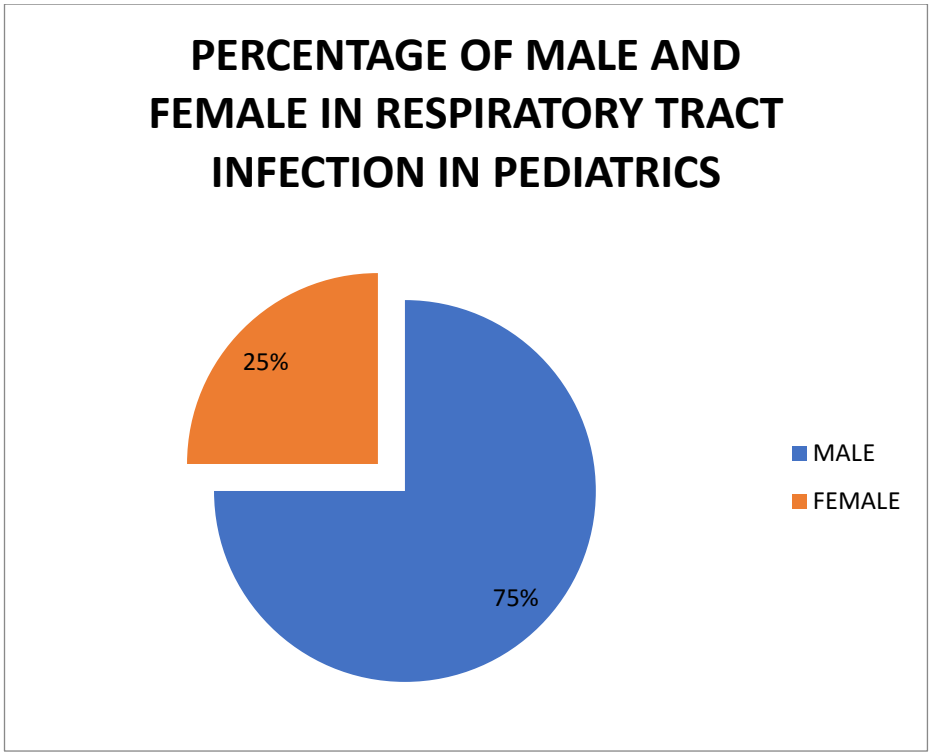
SI.NO	**Respiratory tract infections**	**Causative Agents**	**Recommended Treatment**
1	Common cold	Rhinoviruses Coronaviruses Adenoviruses Influenza viruses	Acetylcysteine Highdose inhaled corticosteroids in children who are wheezing (Budesonide , 1600 mcg)
2	Pharyngitis	Streptococcus Corynebacterium diphtheria	Over-the counter pain relivers such as oral ibuprofen may be helpful in relieving discomfort from pharyngitis
3	Pharyngitis	Streptococcus Pneumoniae Influenza	Amoxicillin (45 mg per kg, twice daily) is the antimicrobial agent of choice for first line treatment of uncomplicated acute sinusitis.

Microbes responsible for LRTIs and the treatment guidelines in children

SI.NO	**Respiratory tract infection**	**Causative agents**	**Recommended treatment**
1	Pneumonia	streptococcus pneumoniae Ecoli Pseudomonas aeruginos	Ampicillin :50 mg per day, or benzyl penicillin : 50000 units per kg im or iv every 6 hours for atleast 5 days Gentamicin: 7.5 mg per kg im or iv once a day for atleast 5 days.
2	Bronchitis and Bronchiolitis	H influenzae S pneumoniae Parainfluviruses Influenza viruses Adenoviruses	Amoxicillin 20 -40 mg/kg/ day in 3 divided doses Sulfamethoxazole with trimethoprim 80mg , twice daily for 7 days

RESULTS:

GENDER DISTRIBUTION:



- **MALE** Percentage is **75%**
- **FEMALE** Percentage is **25%**

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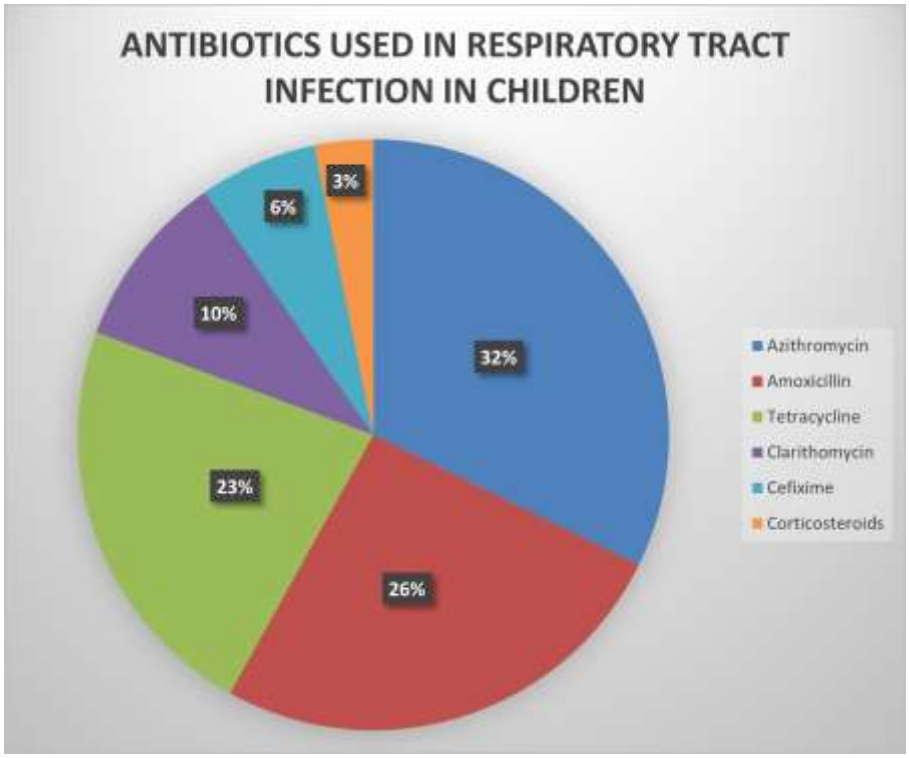
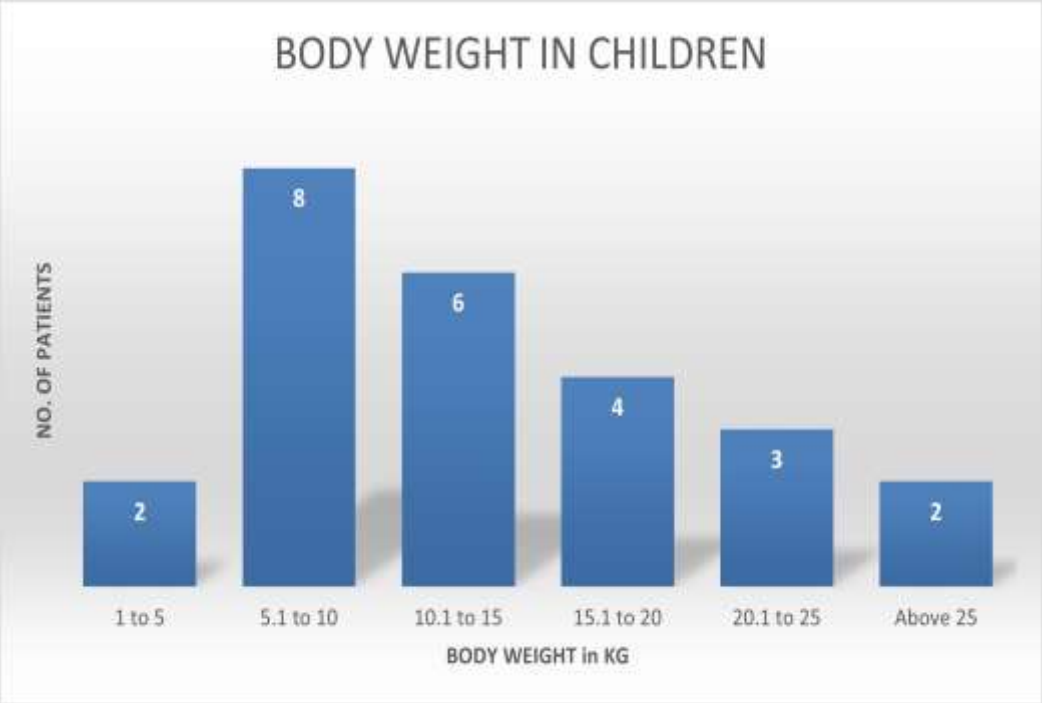


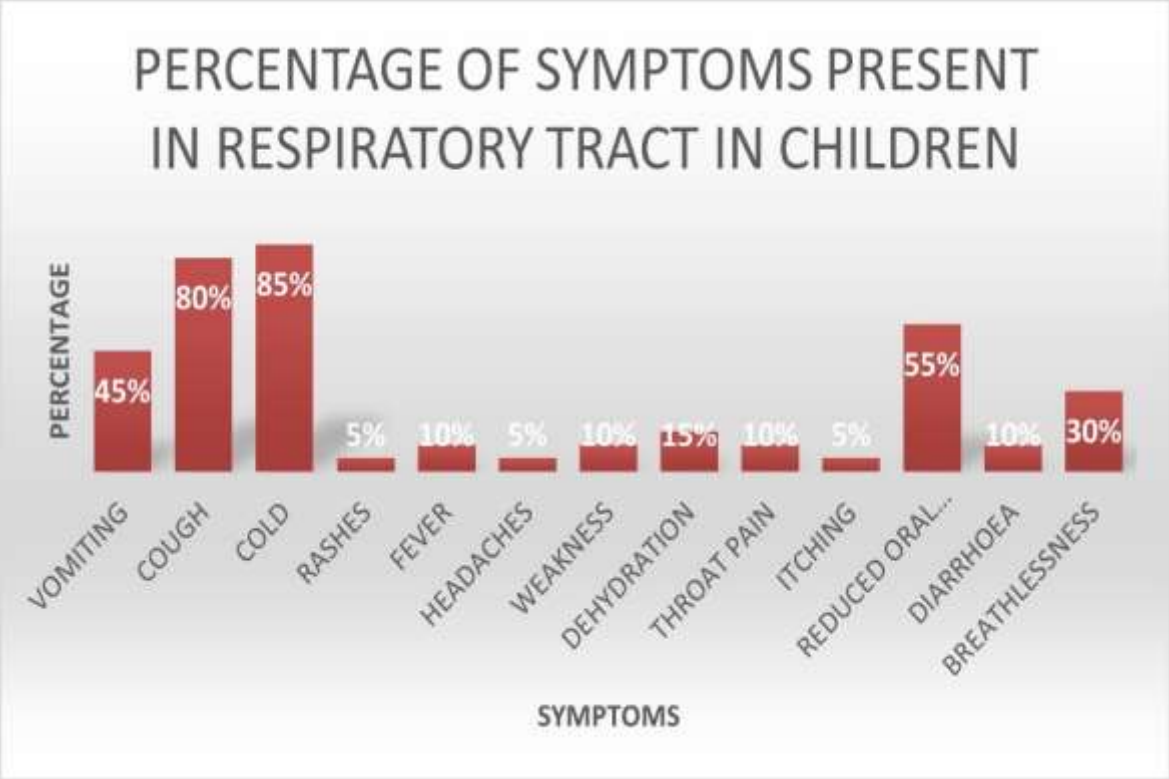
Most commonly prescribed drugs were **Azithromycin (32%)** which comes under the class of macrolide antibiotics. Followed by **Amoxicillin (26%)**, **Tetracycline (23%)** and least prescribed drugs is **corticosteroids.**

BODY WEIGHT IN CHILDREN:



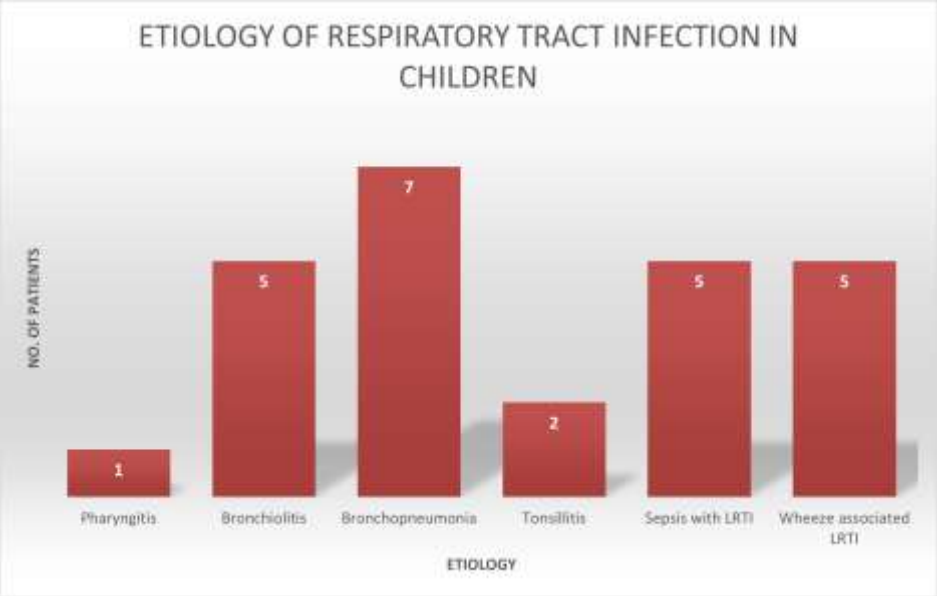
The highest body weight is seen in children between **5.1 to 10**. And lowest body weight is seen in age group between **1 to 5.**

SYMPTOMS:



The highest frequency of symptoms has been seen in children such as **cold with 45%** and **cough with 80%.** And the least diagnosed symptom is **rashes and itching with 5%.**

ETIOLOGY:



- **Highest:** Bronchopneumonia with 7 cases.
- **Lowest:** Pharyngitis with 1 case.

Discussion

Studies of drug utilization pattern of different diseases have become very important tool to evaluate health care system. It will throw a light on different aspects of prescribing pattern in the particular area in specific period, and will help to analyze it. Such studies will also help to implement different ways to improve prescribing trends.

In this study, the males are more than the females. Adverse drug reactions seen in our study were caused by antibacterial. The RTI is seen in pediatrics under the age of 12 years old. Bronchopneumonia and Bronchiolitis are the most frequently diagnosed diseases. The common symptoms seen in the children is cough, cold followed by vomiting, shortness of breath. The most commonly prescribed antibiotics are Amoxicillin and Azithromycin. Prescribing right antibiotics for respiratory tract infection in children and unecessary prescribing of antibiotics in children results in irrational prescription

CONCLUSION:

In conclusion, Bronchopneumonia is the most common cause of admission among respiratory tract infection in pediatric patients. Identification of etiology of the infection is very important in management of patients with respiratory tract infections. In improving RTI knowledge and increasing awareness in the medical community, on current therapy. This study may be more meaningful to improve further the prescriptions through successful implementation of the investigational programs in the health care. In order to reduce the risk of antibiotic resistance of microbes, an antibiotic policy should be carefully instituted and implemented.

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