

A Study on a Prevalance of Respiratory Tract Infection among Pediatric Patients at Teaching Hospital

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ABSTRACT

Background:

Globally, acute lower respiratory tract infections are an important cause of morbidity and mortality in children <5 years of age. It is inflammation of the airways/pulmonary tissue, due to viral or bacterial infection, below the level of the larynx.

Objectives: The study was conducted to assess the prevalence, prescription pattern, and adverse drug reactions associated with lower respiratory tract infections among paediatric patients.

Materials and Methods: A prospective observational study was carried out for a period of six months in Paediatric Department, Basaveswara Medical College Hospital and Research centre, Chitradurga.

Results: In this study, a total of 114 patients with lower respiratory tract infections were enrolled. Among them the prevalence of LRTI in paediatrics was found more in WALRI that is 44.66%, followed by pneumonia (34.2%), bronchiolitis (19.40%), bronchitis (0.87%), and asthma (0.87%) which is highly significant with the p-value(0.0). A high prevalence was noticed with age group 1-5 years. The common risk factors for the LRTI were found to be, Overcrowding (staying in rush street), absence of proper air ventilation in home, indoor smoke & dust, climatic conditions, and illiterate parents (lack of knowledge and understanding about LRTI). Among the prescription pattern of drugs, monotherapy is mostly preferred than dual & triple therapies to treat the conditions.

Conclusion: The study reveals a high prevalence of lower respiratory tract infections in paediatric patients and present study may be propitious for the physician for optimizing rational use of druds and improve health care in LRTI patients.

Keywords: Prevalence; Lower respiratory tract infections

I. INTRODUCTION

Acute respiratory tract infection (ARTI) encompass bacterial and viral infection of the upper respiratory tract (URT) and lower respiratory tract

(LRT).¹⁰ ARTI can be classified as upper respiratory tract infection (URTI) and lower respiratory tract infection (LRTI). LRTI includes acute bronchitis, bronchiolitis, and pneumonia.⁵ ARTI are the major cause of morbidity and mortality worldwide.² The world health organization (WHO) estimate that respiratory infection accounts for 6% of the total global burden of the disease. Acute respiratory infections are the leading cause of death in young children resulting in 1.9 million childhood death per year in developing countries, 20% of these are from India.⁵ Pneumonia is one of the most important cause of child death.³³ RTI are usually manifested by a combination of cough, sore throat, wheeze and fever.³⁷ Acute respiratory infections are the leading cause of death in young children resulting in 1.9 million childhood death per year in developing countries. Pneumonia is one of the most important cause of child death.³³ RTI are usually manifested by a combination of cough, sore throat, wheeze and fever.³⁷ Many lower respiratory infections are self-limited and resolve without the need for additional treatment. Ingest plenty of fluids, and get plenty of rest, using a humidifier to breathe warm, moist air may provide relief. Also, be sure to avoid cigarette smoke (family members) and other pollutants, such as chemical fumes. The most commonly used drugs for LRTI are antibiotics (such as Amoxicillin-Clavulanic acid, amoxicillin, cefotaxime..)⁵, bronchodilators (salbutamol, ipratropium bromide, theophylline..), anti-viral drugs (amantadine, ribavirin..) and corticosteroids. The commonly used corticosteroid was prednisolone.¹² Most common route of administration is oral followed by inhalational, intravenous, and topical. Antibiotics are also responsible for the largest number of medication related adverse events, implicated one of every 5 visits to emergency department for adverse drug reaction. Adverse events range in severity from mild (for example: diarrhea, rash) to life-threatening (for example: Steven-Johnson syndrome, anaphylaxis, or sudden cardiac death).

This study is majorly designed to analyze the prevalence & risk factors of LRTI and also intended at evaluating the drug therapy as well as possible adverse drug reactions (ADRs) among these patients.

II. MATERIALS AND METHODS

A six- month prospective observational study was conducted on paediatric patients with lower respiratory tract infections who were admitted in Basaveshwara Medical College Hospital and Research Centre, Chitradurga. The study was initiated after obtaining, the ethical clearance from Institutional Ethics Committee (IEC). Subjects who have satisfied the above criteria have been recruited into the study. All the subjects were explained regarding the study by using patient information sheet (PIS) and Informed Assent Form was obtained. The demographic details, medical information, medication data and other relevant information were documented in a pre structured data collection form. A self-designed questionnaire was used to assess the risk factors of the subjects.

INCLUSION CRITERIA:

- Patient of age less than 12 years.
- Both inpatient and outpatient.

$$\text{Prevalence} = \frac{\text{Number of population with disease at a given time} \times 100}{\text{Total number of population at a given time}}$$

- Patients with lower respiratory tract infection

EXCLUSION CRITERIA:

- Patient of age greater than 12 years.
- Comatose subjects.

SOURCES OF DATA:

- Lab reports.
- Interaction with patients.
- Treatment charts.

III. STATISTICAL ANALYSIS

The data were entered in Microsoft Excel sheets and analysis has been done by Social Programme Scientific Software (SPSS) version 27. The data was analyzed by Descriptive methods (Mean), Chi-square, Pearson correlation for correlation and Fisher exact test.

IV. RESULT

Among 114 subjects with LRTI, 1 Subject were associated with asthma, 22 were associated with bronchiolitis, followed by one with bronchitis, 39 with pneumonia, and 51 patients with WALRI. The prevalence of LRTI in each disease was found to be:

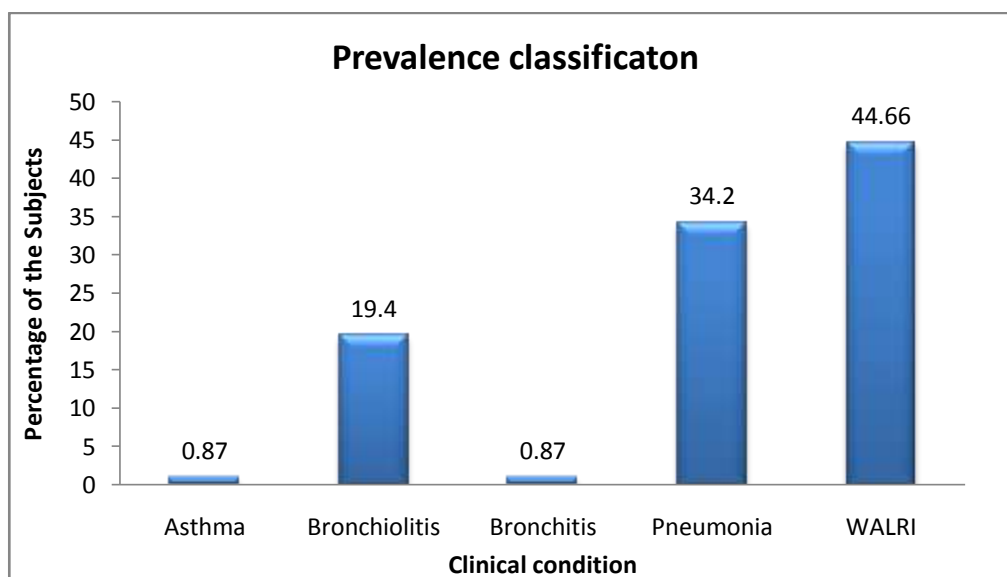


Fig no.1 Distribution of various LRTIs among paediatric patients.

Conclusion:

Prevalence of asthma was 0.87%, followed by bronchiolitis (19.40%), bronchitis (0.87%), pneumonia(34.20), and WALRI (44.66%). Prevalence of WALRI (44.66) is more commonly in paediatrics.

DISTRIBUTION OF SUBJECTS ACCORDING TO AGE GROUP

In our study, patients were divided into 4 groups based on different age. Out of 114 patients, 37.7% were from <1 years followed by 43.9%, 10.5%, and 7.9% selected from 1-5 years, 6-10 years, and 11-15 years respectively. The result as presented in graphically represented in Fig no. 2.



Fig no. 2 Distribution of subjects according to age group

DISTRIBUTION OF SUBJECTS ACCORDING TO GENDER:

Among the 114 subjects having LRTI, 84 (73.7%) were males and 30 (26.3%) were females. Result as shown in graphically represented in Fig no.3.

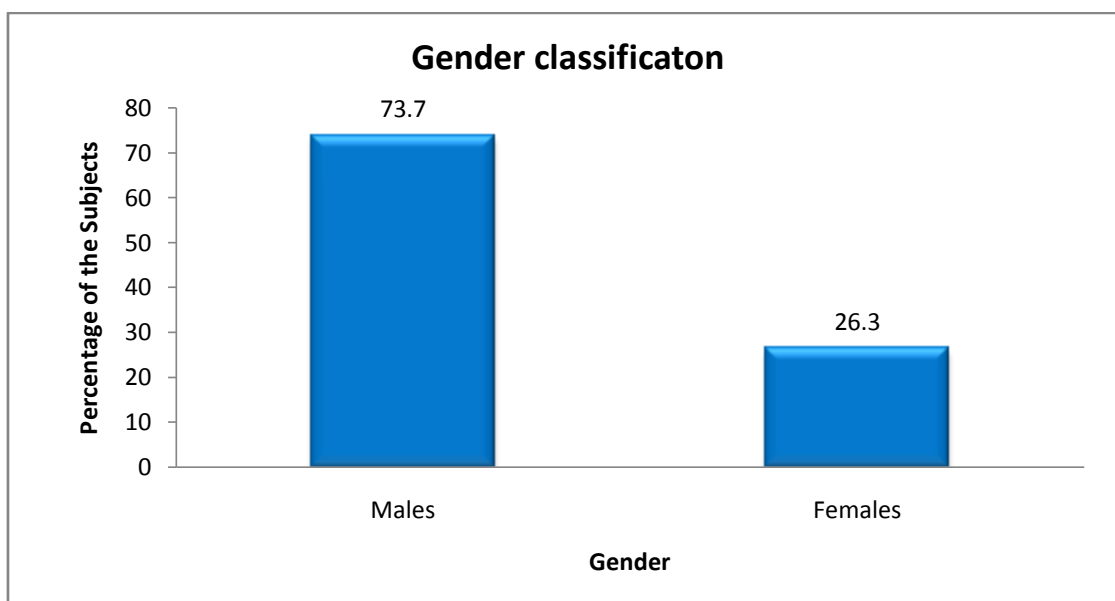


Fig no.3 Distribution of subjects according to gender

DISTRIBUTION OF SUBJECTS ACCORDING TO AGE V/S GENDER

Among the 114 subjects, males are more prone to LRTIs compare to females. At the age of <1 year it is 40.5%, followed by at 1-5 years 44%, 6-10 years 8.3% and 11-15 years it is found to be 7.2%. Result as graphically represented in figno..4

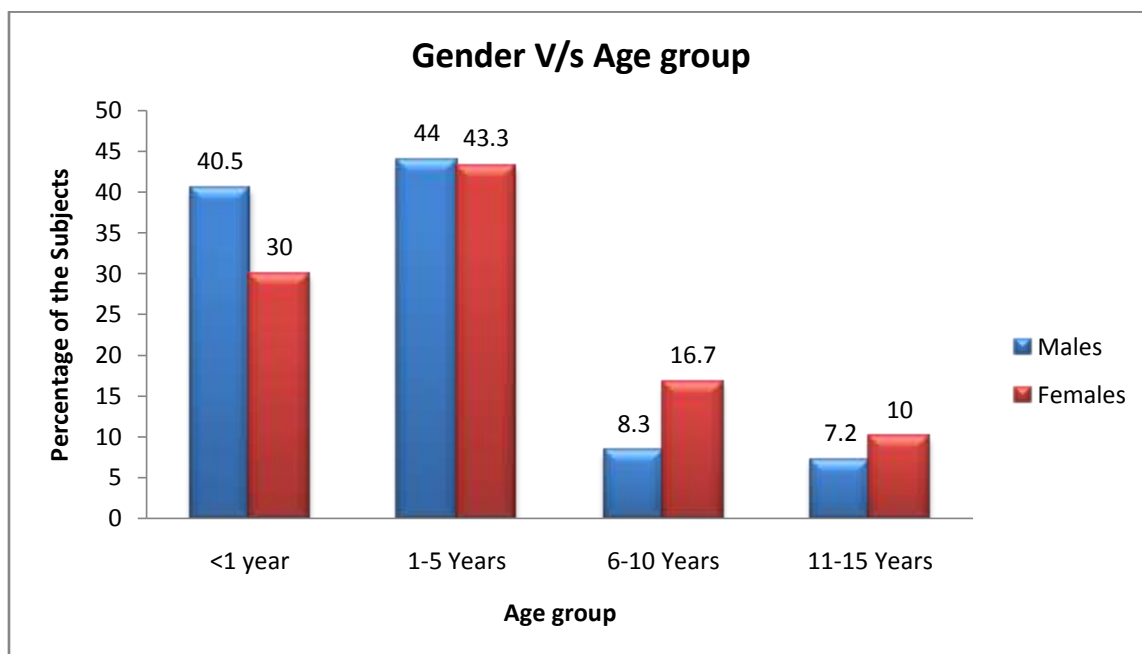


Fig no.4 Distribution of subjects according to age v/s gender

DISTRIBUTION OF SUBJECTS ACCORDING TO CLINICALCONDITION v/s AGE

Among the 114 subjects, 1-5 is the age that highest number of LRTIs were occur. And the most common disease was found to be was WALRI. Result as shown graphically in fig no.5

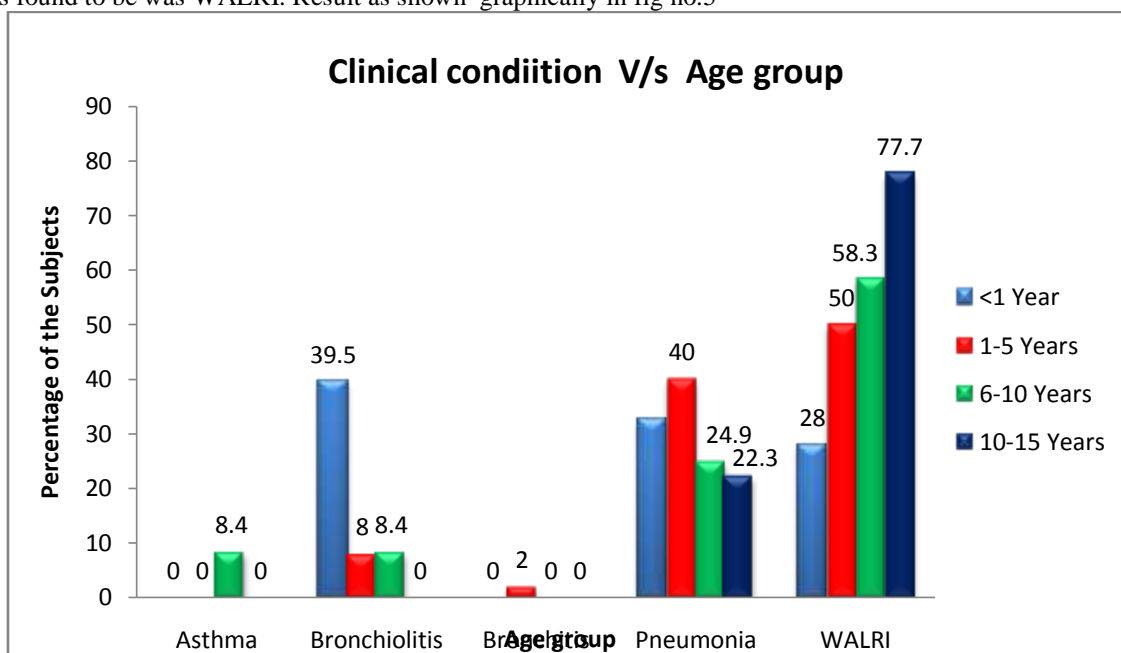


Fig no.5 Distribution of subjects according to clinical condition v/s age group

PRESCRIPTION PATTERN OF DRUGS:

Out of 114 patients, 69.9% were treated with mono-therapy, 26.8% were treated with dual therapy and 3.3% were treated with triple therapy. In mono-therapy most commonly prescribed drugs are; salbutamol (5.2%), amikacin (23.5%), oseltamivir (4.6%), linezolid (1.3%), azithromycin (11.8%), oxymetazoline (22.3%), prednisolone (0.6%), vancomycin (0.6%), adrenaline (5.9%),

ampicillin (2.6%). In dual therapy the commonly prescribed drugs are; levosalbutamol + ipratropium bromide (3.3%), piperacillin + tazobactam (1.3%), montelukast + levocetirizine (1.3%). In triple therapy the commonly prescribed drugs are; ambroxol + guaifensin + terbutaline (3.3%). Result as presented in table no.5.6 and graphically represented in fig no.6

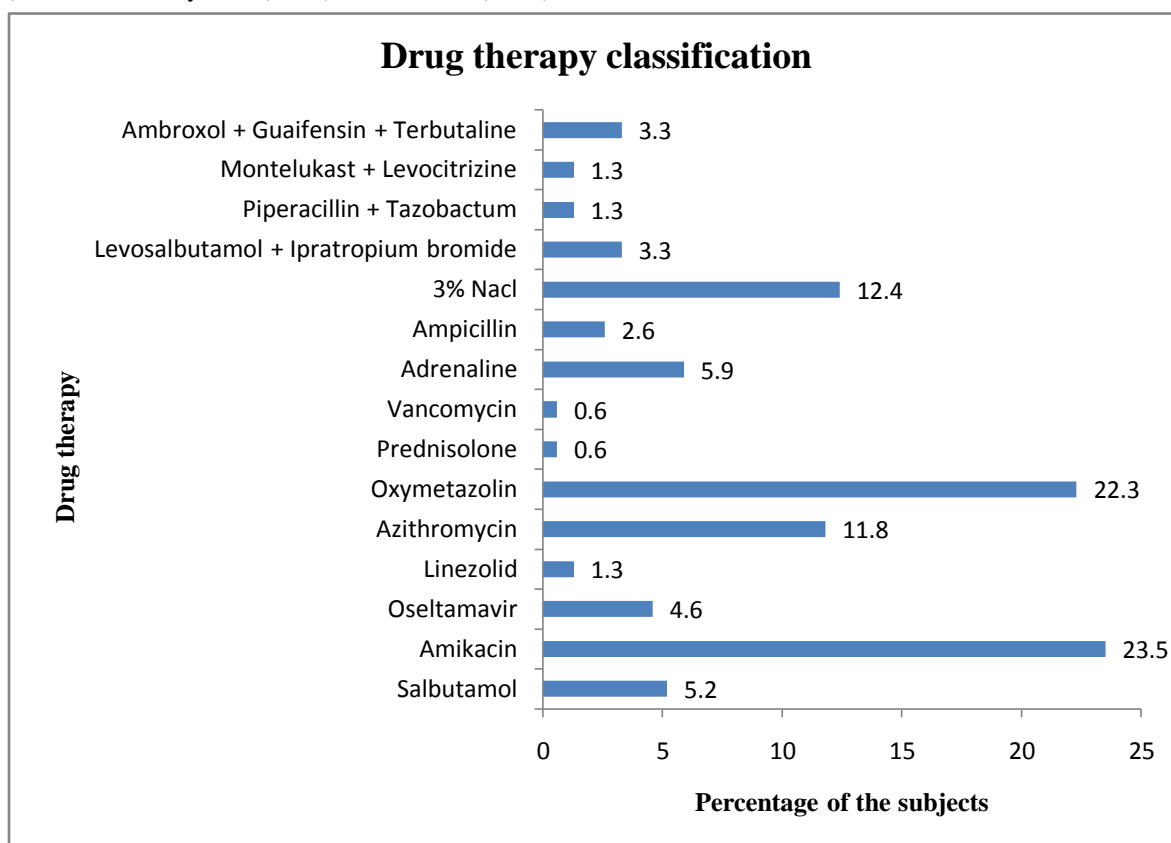


Fig no. 6 Prescription pattern of drugs

ADRs associated with the treatment:

A total of 114 subjects were enrolled in the study who are having various LRTIs. Among these subjects no ADRs were observed and reported.

V. DISCUSSION

Lower respiratory tract infection are the most common type of RTI and it's a common cause of morbidity and mortality. The world health organization (WHO) estimates that respiratory infections account for 6% of the total global burden of disease. Each year ARI's account for over 12 million hospital admissions in children less than 5 years. It constitutes one-third of the deaths in under five in developing countries. Paediatrics are a group

of population vulnerable to many infections. The burden of RTIs are growing faster day by day because of the poor lifestyle, polluted environment, and even inadequate care given to them when they are born. LRTIs have been affecting the quality of life of a number of children which can even turn fatal. Antibiotics are often used for the treatment of acute respiratory infections. Overall in children, WALRI is the commonest manifestation of respiratory distress. Early detection, treatment and prevention can improve the later life of a child. The study is conducted to assess the prevalence, prescription pattern & ADRs associated with lower respiratory tract infections among paediatric patients at teaching hospital. On analyzing our

study, a total of 114 patients with lower respiratory tract infections were enrolled. Among them the prevalence of LRTI in paediatrics is found more in WALRI that is 44.66%. followed by pneumonia (34.2%), bronchiolitis (19.40%), bronchitis (0.87%), and asthma (0.87%). The p-value is $p=0.01$ which determines highly significant, by which the null hypothesis is rejected and alternative hypothesis is accepted. A high prevalence is noticed with age group 1-5 years. This is due to susceptibility and immaturity of the respiratory tract in this age group. According to the study, among the 114 subjects, high prevalence is noticed among the male gender. This may be due to anatomic, lifestyle, behavioural, and socioeconomic differences between males and females. In this study, among the prescription pattern of LRTI in paediatrics, monotherapy is mostly preferred than dual & triple therapies to treat the condition. The most commonly prescribed drugs was Oxymetazoline (22.3%), amikacin(23.5%), 3% NaCl (12.4%), azithromycin(11.8%), salbutamol (5.2%), oseltamivir(4.6%), adrenaline (5.9%),linezolid(1.3%), prednisolone(0.6%), ampicillin (2.6%), vancomycin(0.6%). In dual therapy the commonly prescribed drugs are levosalbutamol+ ipratropium bromide (3.3%), piperacillin+tazobactam(1.3%), montelukast+levocitrizine (1.3%) and in triple therapy the drugs that were prescribed are ambroxol+guaifensin+terbutaline(3.3%). Which may be due to high preference of these drugs by the physician. Most RTIs are self limiting that will resolve with time and supportive management. RTIs are both bacterial and viral infections. **Mustafa Get al**,conduct a similar study on respiratory and infectious diseases and found that supportive care with hydration and oxygenation as a primary intervention. The other agents used are bronchodilators (Eg: salbutamol, ipratropium bromide and theophylline), corticosteroids (eg: prednisolone), anti-viral agents, anti-bacterial agents(eg: penicillin,azithromycin), nasal decongestants, leukotriene antagonists (eg: montelukast), and nebulized hypertonic normal saline(3% NaCl).⁴²**Binu MK**et al, conduct a study on drug use evaluation of bronchodilators in paediatrics in a tertiary care hospital and found that, In the study population of 133 patients male children were found to be more (58.6 %) than the female children (41.4%) Most of the bronchodilators were prescribed for infants (48.1%). Of the 133 pediatric patients, the major

prescription was for SABA (99.2%). Of which the major prescription was for salbutamol (63.2%). Most of the Children with asthma were prescribed with combination therapy of salbutamol and ipratropium (81.3%). In WALRI, patients were prescribed with salbutamol (40.4%) and in acute bronchiolitis, the major prescription was found to be salbutamol and ipratropium combination (70.3%). In 52.6% of the prescriptions bronchodilator were given by nebulization and oral route. 31.6% were given by nebulization. 95.5% of patient was prescribed with antibiotics along with bronchodilators, followed by mucolytics 55.6%. Asthma action plan and patient education were not provided by healthcare providers. No ADRs were observed in the study, may be due to lack of awareness or due to lack of effective follow-up. Since ADRs were not reported during the study, null hypothesis is rejected and alternative hypothesis is accepted.

VI. CONCLUSION

According to the analyzed results and from view of literature, the conclusions made are:

- WALRI is most commonly seen in paediatrics of age group 1-5 years. Males were more as compared to females.
- Among the prescription pattern of drugs, monotherapy is mostly preferred than dual & triple therapies to treat the conditions.
- In monotherapy the commonly prescribed drugs are; salbutamol, amikacin, oseltamivir, linezolid, azithromycin, oxymetazoline, prednisolone, vancomycin, adrenaline, ampicillin and 3% NaCl.
- In dual therapy the commonly o prescribed drugs are; levosalbutamol+ipratropium bromide, piperacillin+tazobactam and montelukast+levocitrizine.
- In triple therapy the commonly prescribed drugs are; ambroxol+guaifensin+terbutaline.

From our study we saw that WALRI is the most commonly occurred lower respiratory tract infection at the age group of 1-5 years. Hence it is propounded to conduct further studies on this topic and to create awareness among the LRTI patients and to the caretakers at prior stage itself to eradicate such a situation from the society.

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