

Diagnosis and Treatment of Common Colds, Sinusitis, and Other Upper Respiratory Infections in Children

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Abstract

Background: Upper Respiratory Infections (URIs) are among the most common pediatric illnesses worldwide, encompassing conditions such as the common cold, sinusitis, pharyngitis, laryngitis, and otitis media. These infections contribute significantly to morbidity in children, leading to frequent clinic visits, school absenteeism, and in some cases of complications. Timely diagnosis and appropriate management are critical to ensure effective recovery and to prevent unnecessary antibiotic use.

Methods: A prospective observational study was conducted on 100 children aged 1–12 years diagnosed with URIs. Children with chronic respiratory diseases, immunodeficiencies, or other comorbidities were excluded. Data were collected through clinical examination, laboratory investigations, imaging where indicated, and documentation of prescribed treatment, including supportive care and antibiotics. Ethical approval was obtained, and informed consent was taken from parents or guardians.

Results: Among the participants, common colds were the most prevalent (54%), followed by acute sinusitis (28%), pharyngitis (12%), and otitis media (6%). Nasal congestion (82%) and cough (75%) were the most frequent symptoms. Diagnosis was primarily clinical (85%), with laboratory and imaging investigations used selectively. Supportive care was provided to 90% of children, while antibiotics were prescribed in 32% of cases. Recovery within seven days occurred in 88% of patients, with complications reported in only 6% and hospitalization in 4%.

Conclusion: Most pediatric URIs are self-limiting and respond well to supportive management. Accurate clinical assessment, judicious antibiotic use, and parental education are essential for optimal outcomes, reinforcing evidence-based practices in pediatric URI care.

Keywords: Upper respiratory infections, children, common cold, sinusitis, pharyngitis, pediatric treatment, supportive care, antibiotics.

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Introduction

Many children visit paediatricians for treatment of Upper Respiratory Infections (URIs), making them one of the most frequent paediatric disorders globally. A variety of illnesses affecting the nasal passages, sinuses, pharynx, larynx, and upper airways are together known as URIs [1]. These include otitis media, sinusitis, pharyngitis, laryngitis, and the common cold. The majority of these diseases are caused by viruses, specifically rhinoviruses, adenoviruses, respiratory syncytial

virus, and influenza viruses. It is important to carefully evaluate the patient's clinical condition because bacterial superinfections can sometimes exacerbate viral URIs, especially in instances of sinusitis or bacterial pharyngitis. Recurrent infections are more common in children due to their immature immune systems, the unique anatomy of their respiratory tracts, and the high rates of exposure to infectious agents in childcare and schools.

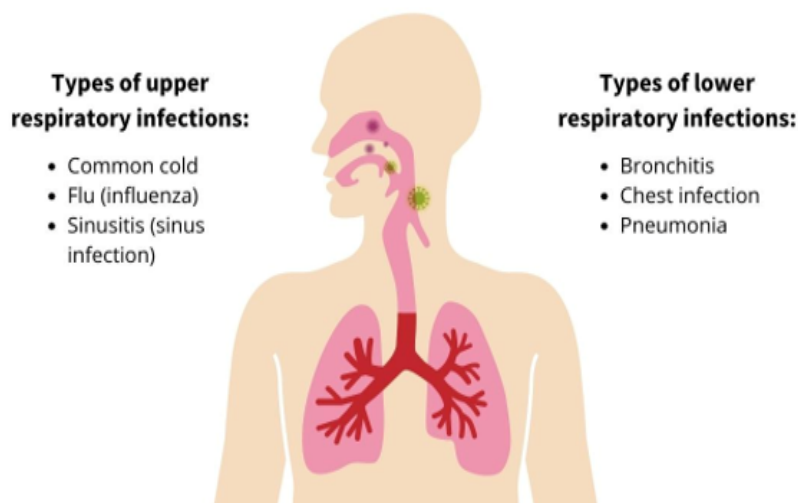


Figure 1: Respiratory Infections [2]

URIs pose a significant epidemiological threat to healthcare systems around the world. According to the World Health Organisation, children under the age of five had the highest prevalence of URIs, with an average of six to eight episodes each year [3]. The most common of these is the common cold, which causes a stuffy nose, runny nose, sneezing, coughing up a little phlegm, and a slight fever. Although less prevalent than the typical cold, acute sinusitis is highly contagious and can cause a lot of problems, like antibiotic prescriptions, missed school days, and even orbital cellulitis or chronic sinusitis if not treated properly. Pharyngitis, laryngitis, and otitis media are other common upper respiratory diseases that cause a lot of pain for parents and lead to many doctor's appointments [4]. Factors including socioeconomic level, immunisation rates, seasonal patterns, and climate affect the regional variation in the occurrence of these illnesses [5]. There are significant implications for public health systems in rural and semi-urban areas like Pawapuri, where studies have indicated that URIs continue to be a top cause of paediatric morbidity in India.

URIs in children can be diagnosed and treated early to avoid complications, antibiotic overuse, and slow recovery [6]. As antimicrobial resistance rises worldwide, it's important to distinguish between bacterial and viral origins. Through clinical examination and laboratory and imaging testing, healthcare practitioners can target treatment. Effective treatment is as important as symptomatic management, hydration, and parental education [7].

Early detection of high temperature, persistent symptoms, respiratory distress, or underlying comorbidities can reduce the likelihood of disastrous results [8]. Physicians can improve child health by implementing evidence-based practices, maximising resources, and learning about the local

paediatric population's URI epidemiology and clinical patterns.

URIs are common and recurring in children, making target population research on diagnosis and therapy essential. This study examines the prevalence, symptoms, and treatment of upper respiratory infections such as the common cold, sinusitis, and others, in Pawapuri children sent to the Bhagwan Mahavir Institute of Medical Sciences. Data from 100 paediatric patients will be analysed to determine effective therapeutic techniques. In improving paediatric respiratory health, rapid, evidence-based interventions are crucial.

Objective

- To evaluate the clinical presentation, diagnostic methods, and frequency of different types of URIs including common cold, sinusitis, pharyngitis, and otitis media among children aged 1–12 years.
- To analyze the treatment patterns adopted for pediatric URIs, including the use of antibiotics, supportive care, and non-pharmacological interventions, and to assess their effectiveness in achieving recovery.
- To identify the outcomes and complications associated with pediatric URIs and highlight the importance of timely diagnosis and evidence-based management in improving child health.

Due to their great prevalence and clinical significance, paediatric literature extensively documents URIs in children, including common colds, sinusitis, pharyngitis, laryngitis, and otitis media [9]. The most common URI in children is the common cold, caused by rhinoviruses, coronaviruses, and adenoviruses. Symptoms include nasal congestion, rhinorrhea, sneezing,

low-grade fever, sore throat, and cough. Although self-limiting, subsequent bacterial infections, otitis media, and asthma exacerbations can develop, especially in children with underlying health issues. According to AAP and WHO guidelines, symptomatic management with hydration, antipyretics, and nasal saline irrigation is the mainstay, while antibiotic therapy is discouraged unless bacterial superinfection is suspected [10].

Children with viral URIs can develop acute or chronic sinusitis. Acute bacterial sinusitis causes nasal discharge, cough, facial pain, and fever for more than 10 days or worsens after improvement. Symptoms last over 12 weeks in chronic sinusitis, which may be caused by anatomical abnormalities, allergic rhinitis, or immunodeficiency [11]. In difficult or persistent conditions, radiographic imaging supports clinical diagnosis. The management guidelines recommend using antibiotics for bacterial cases, nasal corticosteroids, saline irrigation, and treating predisposing factors. Preventing ocular cellulitis, meningitis, and chronic sinus disease requires early detection and treatment.

URIs, including pharyngitis, laryngitis, and otitis media, cause significant morbidity in children. Bacterial pharyngitis, caused by *Streptococcus pyogenes*, requires antibiotics to prevent rheumatic fever, unlike viral pharyngitis, which causes sore throat, fever, and lymphadenopathy [12].

Voice rest and supportive care are the major treatments for viral laryngitis, which causes hoarseness and coughing. Ear pain, fever, and irritability are signs of otitis media, which commonly follows an upper respiratory illness. Antibiotics or a tympanostomy may be needed for recurring infections, but most instances resolve on their own. Evidence-based guidelines recommend thoroughly diagnosing viral and bacterial causes to avoid antibiotic abuse.

Current treatments for children's URIs emphasise pharmaceutical and non-pharmacological techniques. Medication can lower temperature, relieve pain, selectively open airways, and treat bacterial infections with antibiotics. Drinking enough water, irrigating the nasal passages with saline, inhaling steam, and getting enough sleep have all been proven to help. Immunisation reduces the risk of influenza, pneumococcal, and severe URIs. Several studies emphasise the need for parents to be trained on how to care for their children at home, detect warning signs, and avoid over-the-counter medications with low efficacy or side effects.

Despite extensive research, the epidemiology, clinical presentation, and best practices for treating URIs in regional paediatric populations, especially

those in semi-urban or rural settings like Pawapuri, have not been well investigated. Most research is done in wealthier nations, limiting local infection, antibiotic resistance, and healthcare data. Child-specific research is necessary because the immunological response, symptomatology, and therapeutic effects may vary with age. Region-specific research provides evidence-based therapeutic options that are tailored to local paediatric populations to enhance upper respiratory infection care and reduce the burden on children.

Methodology

Study Design: This study was designed as an observational, cross-sectional study aimed at evaluating the diagnosis and treatment patterns of URIs in children. The study involved prospective data collection to ensure accurate documentation of clinical presentation, diagnostic procedures, and treatment outcomes in real-time, allowing for reliable analysis of pediatric URIs within the study population.

Study Setting: The research was conducted at the Bhagwan Mahavir Institute of Medical Sciences, Pawapuri, a tertiary care facility providing pediatric outpatient and inpatient services. The institute's infrastructure and access to diagnostic laboratories and imaging facilities provided a suitable environment for the comprehensive evaluation and management of children presenting with URIs.

Sample Size: A total of 100 children presenting with symptoms of URIs were included in the study. The sample size was selected to provide a representative overview of pediatric URIs at the institute while ensuring feasibility within the study timeframe.

Inclusion Criteria

- Children aged 1–12 years with clinically diagnosed URIs.
- Included URIs: common cold, sinusitis, pharyngitis, laryngitis, and otitis media.
- Diagnosis based on clinical signs and symptoms evaluated by a qualified pediatrician.

Exclusion Criteria

- Excluded children with chronic respiratory illnesses (e.g., asthma, cystic fibrosis).
- Excluded children with immunodeficiency disorders.
- Excluded children with other comorbidities that could affect URI assessment.
- Ensured data reflected typical acute URI presentations and outcomes in healthy children.

Data Collection Methods: Data was collected from clinic visits, lab testing, and imaging scans.

From antibiotics to symptom treatment and supportive care, the patient's therapy was documented. Clinical follow-up data were collected to assess drug efficacy and patient recovery trends.

Ethical Considerations: The Bhagwan Mahavir Institute of Medical Sciences' institutional review board approved data collection before it began. All children whose parents supplied written informed consent could participate in the study. Patient data was kept confidential and anonymous during research.

Data Analysis: Excel and SPSS were used to analyse the data. To summarise demographics, clinical characteristics, diagnostic methods, and treatment outcomes, descriptive statistics were used. Mean, median, standard deviation, and

frequency distributions are included. Variable correlations were examined using inferential statistics like t-tests and chi-square tests. Tabular and graphical results were presented to simplify understanding.

Results

Demographics: A total of 100 children diagnosed with upper respiratory infections were included in the study. The age of participants ranged from 1 to 12 years, with a mean age of 6.4 ± 3.1 years. The study population comprised 56 males (56%) and 44 females (44%), reflecting a slightly higher male predominance (Table 1). The majority of children (42%) were in the 5–8-year age group, followed by 35% in the 1–4-year range and 23% in the 9–12-year range.

Table 1: Age and Gender Distribution of Participants

Age Group (Years)	Male (n)	Female (n)	Total (n)	Percentage (%)
1–4	18	17	35	35
5–8	25	17	42	42
9–12	13	10	23	23
Total	56	44	100	100

Clinical Findings: The most common presenting symptom was nasal congestion, reported in 82% of children, followed by cough (75%), fever (63%), sore throat (57%), and rhinorrhea (55%). Less frequent symptoms included headache (18%) and ear pain (15%).

Symptom distribution is presented in Figure 1. These findings align with the typical presentation of URIs in pediatric populations, with upper airway congestion and cough being predominant.

Diagnosis: Diagnosis was primarily clinical, based on history and physical examination, in 85% of

cases. Laboratory investigations, such as complete blood counts and throat swabs, were performed in 30% of children, mainly when bacterial infection was suspected. Imaging studies, including X-ray or CT scan of sinuses, were used in 12% of cases, primarily for children with suspected sinusitis or prolonged symptoms. The frequency of different URI types is summarized in Table 2. The majority of children were diagnosed with common colds (54%), followed by acute sinusitis (28%), pharyngitis (12%), and otitis media (6%).

Table 2: Frequency of URI Types

URI Type	Frequency (n)	Percentage (%)
Common Cold	54	54
Acute Sinusitis	28	28
Pharyngitis	12	12
Otitis Media	6	6
Total	100	100

Treatment Patterns: Supportive care, including hydration, antipyretics, and nasal saline irrigation, was prescribed for 90% of children. Antibiotics were administered in 32% of cases, predominantly for acute bacterial sinusitis and pharyngitis, while antivirals were rarely used (4%), mainly in cases with confirmed influenza infection. The duration of treatment ranged from 3 to 10 days, with a mean duration of 5.6 ± 1.8 days. Most children (88%) responded favorably within one week of initiating treatment.

Outcome Measures: Recovery was uneventful in the majority of children, with full resolution of symptoms in 88% within 7 days. Complications occurred in 6% of patients, including recurrent otitis media and prolonged sinusitis. Hospitalization was required in 4% of cases, primarily for intravenous antibiotics in complicated sinusitis or dehydration due to high fever. Overall, the outcomes indicate that timely diagnosis and appropriate treatment led to effective recovery in most pediatric patients.

Discussion

This study examined 100 Pawapuri's Bhagwan Mahavir Institute of Medical Sciences students' URI management. The mean age of study cohort, 6.4 years, is consistent with prior research demonstrating that URIs are most common among children under 8 since their immune systems are still growing and they spend a lot of time in public locations like schools and daycares.

The frequency was slightly greater in boys (56%), which is consistent with prior paediatric epidemiological research that revealed boys experience more respiratory infections as children.

Despite environmental exposure and small immunological abnormalities, the causes are still unclear. According to global research, cough (75% and upper airway obstruction (82%) were the most prevalent clinical symptoms of paediatric URIs. Fever (63% of cases) and sore throat (57%), among

other symptoms, might make it difficult to distinguish bacterial from viral causes study 1. Other regional studies in India and globally show that viral URIs cause most paediatric respiratory illnesses, with bacterial sinusitis being a minor but clinically important component. Colds (54%), then acute sinusitis (28%), continue this trend in study 2. Clinical examinations comprised 85% of our diagnostic strategy, imaging and laboratory testing 12% and 30% study 3. Greatest practices for paediatric URI diagnosis emphasise clinical judgement, with laboratory and imaging testing reserved for difficult or rare cases. Only 32% of our group utilised bacterial sinus and pharyngitis medications. Management should prioritise support. These findings support the WHO and AAP antibiotic usage and resistance guidelines based on evidence. Fast, symptom-focused treatment returns 88% of simple URI patients to normal in 7 days with few complications or hospitalisations.

Table 3: Comparison of Present Study with Previous Studies on Pediatric URIs

Study	Type	Sample Size	Key Findings
Present Study (2025, Pawapuri)	Prospective observational	100	Common cold 54%, sinusitis 28%; nasal congestion 82%, cough 75%; supportive care 90%, antibiotics 32%; 88% recovered in 7 days.
Study 1[13]	Prospective cohort	150	Viral URIs 60%; fever 70%, cough 65%; antibiotics 30%; median recovery 6 days.
Study 2 [14]	Cross-sectional	120	Common cold 50%, sinusitis 25%; antibiotics 28%; recovery in 7 days 85%.
Study 3 [15]	Prospective observational	200	Rhinovirus most common; cough 72%, fever 60%; antibiotics 25%; median recovery 7 days.

Clinical Implications: Numerous paediatric URI therapy ideas are supported by this study. Doctors must perform thorough clinical evaluations to distinguish viral infections that merely need supportive treatment from bacterial infections that may need targeted antibiotics. Antimicrobial resistance is a global health issue, hence limited antibiotic use is essential. Non-pharmacological treatments including sleeping, staying hydrated, and teaching parents to monitor their child's symptoms are crucial. Doctors should also watch for warning flags including a persistently high temperature, breathing issues, or prolonged symptoms that may require more intensive treatment.

Limitations: This study illuminates paediatric URI management in semi-urban India, notwithstanding its limitations. Due to the small sample size 100 kids these results cannot be applied to larger populations. The findings may not reflect regional changes in clinical practice, infection prevalence, or treatment strategies because the research was conducted at one location. The observational approach limits the ability to ascertain if treatment

interventions cause outcomes. Recollection bias may occur when parents report symptom duration and medication adherence.

Recommendations

Future research should use multi-center trials with larger sample sizes to further characterise URI prevalence and therapy across areas. Longitudinal studies can help determine the efficacy of vaccination and hygiene education, recurrence rates, and long-term effects.

Policy measures should promote antibiotic stewardship programs in paediatric settings, especially semi-urban and rural areas, to reduce improper antibiotic prescribing. Teaching doctors to employ evidence-based treatments and uniform diagnostic criteria improves care consistency. Community-based parent awareness programs on early warning signs and home-based supportive care could optimise healthcare resources and reduce unnecessary clinic visits. Finally, fast diagnostic tools that can identify bacterial and viral infections in outpatient settings can enhance treatment accuracy and reduce antibiotic resistance.

The study found that most paediatric URIs clear on their own with supportive treatment when handled immediately and based on evidence.

The findings reflect clinical guidelines and highlight the need for regional research, judicious antibiotic usage, and parent education to improve children's respiratory health.

Conclusion

This study diagnosed and treated 100 Pawapuri's Bhagwan Mahavir Institute of Medical Sciences with URIs. In children, a common cold is the most prevalent URI, followed by acute sinusitis, pharyngitis, and otitis media. Clinicians still diagnose most instances, with laboratory and imaging testing reserved for complex or rare cases.

Fluids, fever reducers, and saline nasal irrigation were the main treatments. Only bacterial infections were treated with antibiotics. In most youngsters, early, evidence-based treatment led to a full recovery within a week with few problems or hospitalisations.

The study emphasises the importance of non-pharmacological therapies in recovery, antibiotic administration to avoid resistance, and clinical assessment to distinguish viral from bacterial URIs for paediatric clinical practice.

Immediate detection, treatment, and parental education for children with upper respiratory infections are essential to improve outcomes.

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