Biomedical and Biopharmaceutical Research
Abbreviation: Biomed. Biopharm. Res.
Volume: 18: Issue: 02 |Year: 2021
Page Number: 26-32

A STUDY ON PREVALENCE OF UPPER RESPIRATORY INFECTION AMONG 18 TO 55 AGE GROUP AND ITS RISK FACTORS AND EFFICACY OF PARACETAMOL IN SYMPTOMATIC RELIEF: A HOSPITAL-BASEDSTUDY

Dr. Saransh Jain[1], Dr. Yashpal Prithvi Sinh Jadeja[2], Dr. Naresh Kumar Munda[3]

[1] Associate Professor, Department of Otorhinolaryngology, Faculty of Icare Institute of Medical Sciences and Research and Dr. B C Roy Hospital, Haldia, India
[2] Associate Professor, Department of Pharmacology, Faculty of Icare Institute of Medical Sciences and Research and Dr. B C Roy Hospital, Haldia, India.
[3] Assistant Professor, Department of Community Medicine, Faculty of Icare Institute of Medical Sciences and Research and Dr. B C Roy Hospital, Haldia, India

Corresponding Author

Dr. Naresh Kumar Munda

Assistant Professor, Department of Community Medicine, Faculty of Icare Institute of Medical Sciences and Research and Dr. B C Roy Hospital, Haldia, India
drrnaresh2k @gmail.com

Received: 18-09-2021

Accepted: 9-10-2021

Published: 26-11-2021

©2021 Biomedical and Biopharmaceutical Research. This is an open access article under the terms of the Creative Commons Attribution 4.0 International License.

Abstract

Background: Upper respiratory infections (URIs) are common illnesses affecting individuals of all age groups, particularly adults. This study aimed to determine the prevalence of URIs among individuals aged 18–55 in West Bengal, identify associated risk factors, and assess the efficacy of paracetamol in symptomatic relief.Upper respiratory infections (URIs) are among the most common illnesses globally, caused by viruses such as rhinovirus, influenza, and adenovirus. They present with symptoms like cough, sore throat, nasal congestion, and fever. In India, particularly in densely populated regions like West Bengal, environmental and sociodemographic factors may increase URI prevalence. Methods: A cross-sectional study was conducted with 65 participants presenting URI symptoms. Sociodemographic data, risk factors, and treatment responses were recorded. Symptom severity before and after paracetamol administration was assessed. Results: The prevalence of URIs was found to be 66.2%, with significant associations with smoking, crowded living conditions, and poor hand hygiene. Paracetamol provided significant relief in fever ($p < 0.05$) and headache ($p < 0.01$) but had limited effect on cough and nasal congestion. Conclusion: URIs remain a significant health concern in West Bengal, with modifiable risk factors contributing to their spread. Paracetamol is effective for certain symptoms but may require adjunct therapies for complete relief.

KEYWORDS: Upper Respiratory infection.

INTRODUCTION

Upper respiratory infections (URIs) are among the most common illnesses globally, caused by viruses such as rhinovirus, influenza, and adenovirus. They present with symptoms like cough, sore throat, nasal congestion, and fever. In India, particularly in densely populated regions like West Bengal, environmental and sociodemographic factors may increase URI prevalence[1].

Despite being self-limiting, URIs contribute to productivity loss and healthcare burden. Paracetamol is widely used for symptomatic relief, but its efficacy in different URI symptoms remains understudied in this region[2]. Upper Respiratory Tract Infections (URTIs) are a common ailment in India, with prevalence varying across studies and age groups. While some studies report high prevalence rates, particularly in children, others indicate a decrease in recent years. A significant proportion of these infections are viral in nature, with various respiratory viruses being identified. Key Findings: High Prevalence in Children: URTIs are a leading cause of hospitalization in children, with some studies showing prevalence rates exceeding 50% in children under five. Viral Etiology: URTIs are predominantly caused by viruses, with various respiratory viruses like

Rhinovirus/Enterovirus, Respiratory Syncytial Virus (RSV), and Influenza viruses being commonly identified. Age-Related Differences[3]
Prevalence varies across different age groups, with infants and young children often showing higher rates. Urban-Rural Differences: Some studies indicate a higher prevalence in rural areas, potentially due to factors like living conditions and access to healthcare.[4]
Risk Factors: Several factors can increase the risk of URTIs, including age (particularly young children), exposure to smoke (both indoor and outdoor), household overcrowding, and socioeconomic status. Treatment Seeking: A significant proportion of individuals with URTIs seek treatment at healthcare facilities, but variations exist based on factors like gender, religion, and accessibility to transportation. Important Considerations: Variability in Studies: Prevalence rates can vary significantly between studies due to differences in methodology, study populations, and geographic locations. Impact on Child Mortality: URTIs are a significant contributor to child mortality, highlighting the importance of effective prevention and treatment strategies. Public Health Importance[5]
Understanding the prevalence, risk factors, and treatment-seeking behaviour related to URTIs is crucial for developing effective public health interventions and reducing the burden of these infections[6]
Upper respiratory tract infections (URTIs) are highly prevalent worldwide, with the highest incidence in young children. While generally mild and self-limiting, URTIs can lead to significant morbidity and, in some cases, severe complications. The epidemiology of URTIs is influenced by factors like age, season, and geographic location. Key Epidemiological Features: High Incidence: URTIs, including the common cold, are among the most frequent human illnesses. In 2021, the global incidence of all-cause URTIs was 162,484 per 100,000 population. Age-Related Trends: Children, particularly those under 2 years old, experience the highest incidence rates. Children in daycare and school settings are a major source of transmission. Seasonal Patterns: URTIs, especially those caused by rhinoviruses, peak in the fall and spring, while infections like influenza and RSV tend to peak in the winter.

This study investigates:
1) **Prevalence** of URIs among adults (18–55 years) in West Bengal.
2) **Risk factors** contributing to URI transmission.
3) **Efficacy of paracetamol** in symptom management.

METHODS

This study was conducted in tertiary hospital of Purba Medinipur. After obtaining institutional ethical committee approval It was a Observational cross-sectional study. study conducted on 48 patients in the department of Otorhinolaryngology, at a tertiary care centre, fromFebruary2021–August 2021. The institute Ethics Committee approval was obtained before starting the sample collection. A written and informed consent was taken from the patient regarding the study in his/her vernacular language and English. In this study Patients were subjected to: A detailed history of sign & symptoms and its duration. Detailed history of systemic diseases and its duration, medication were noted. Patients were subjected to General physical examination, and ocular examination

Study Design & Participants

- **Type:** Cross-sectional observational study.
- **Sample Size:** 65 participants (18–55 years) with URI symptoms.
- **Location:** Outpatient clinics in West Bengal.
- **Duration:** [Insert study duration].

Data Collection

1) **Sociodemographic Factors:** Age, gender, occupation, residence, smoking status.
2) **Clinical Assessment:** Symptom severity (fever, cough, sore throat, nasal congestion).

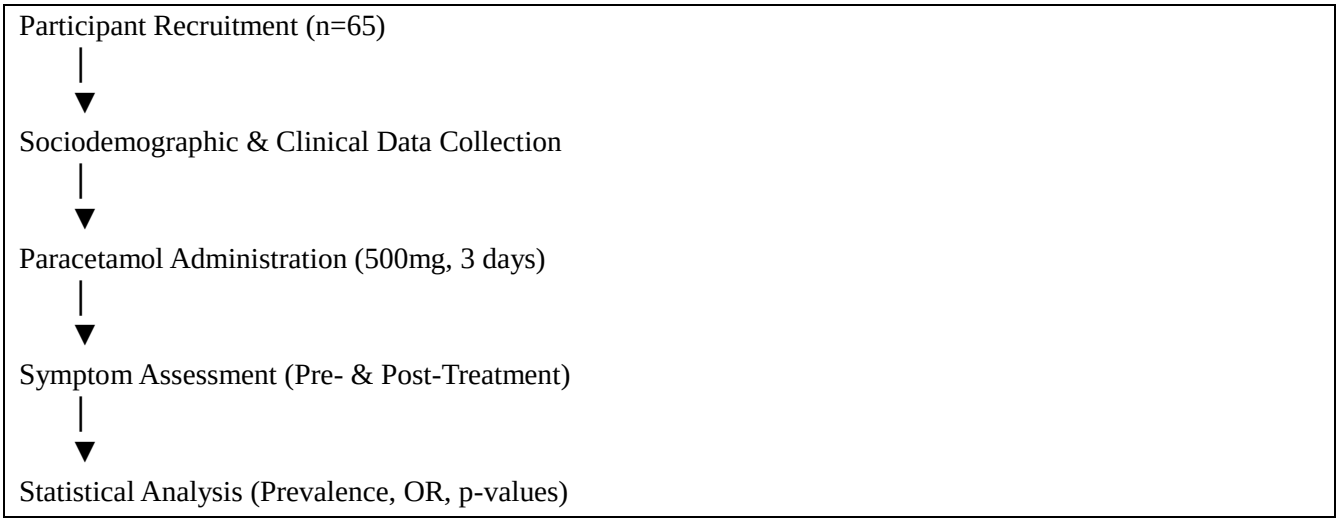
The Journal Biomedical and Biopharmaceutical Research (e-issn:21822379|p-issn:21822360) is licensed under a Creative Commons Attribution 4.0 International License.

3) **Paracetamol Administration:** 500 mg every 6–8 hours for 3 days; symptom improvement recorded.

Statistical Analysis

- **Descriptive statistics** for prevalence and sociodemographic factors.
- **Chi-square test / Fisher's exact test** for categorical risk factors.
- **Odds ratio (OR)** for association between risk factors and URI.
- **Paired t-test / Wilcoxon test** for symptom relief efficacy.

Flowchart of Study Methodology



Statistics and analysis of data

Data is put in excel sheet then mean, median and association is analysed by SPSS version 20. Chi-square test was used as test of significance for qualitative data. Continuous data was represented as mean and SD. MS Excel and MS word was used to obtain various types of graphs such as bar diagram. P value (Probability that the result is true) of P value <0.05 was considered as statistically significant after assuming all the rules of statistical tests. Statistical software: MS Excel, SPSS version 22 (IBM SPSS Statistics, Somers NY, USA) was used to analyse data. Sample size is calculated by N master statistical software

RESULTS

Upper respiratory tract infections (URTIs) are highly prevalent worldwide, with the highest incidence in young children. While generally mild and self-limiting, URTIs can lead to significant morbidity and, in some cases, severe complications. The epidemiology of URTIs is influenced by factors like age, season, and geographic location. Key Epidemiological Features: High Incidence: URTIs, including the common cold, are among the most frequent human illnesses.

Upper respiratory infection depends on various factors among them sociodemographic factors is also important factors which influenced it. Prevalence of URTI is maximum 18 to 30 age group as compare to others. its prevalence is 53.8% male person are more affected by URTI as compared to female gender. The person who employed by occupation more affected to URTI as compared to unemployed person. Smoker were more affected to URTI as compare to nonsmoker(Table 1).

Table 1: Sociodemographic Characteristics (n=65)

Variable	Category	Frequency (%)
Age (years)	18–30	35 (53.8%)
	31–45	20 (30.8%)
	46–55	10 (15.4%)

The Journal Biomedical and Biopharmaceutical Research (e-issn:21822379/p-issn:21822360) is licensed under a Creative Commons Attribution 4.0 International License.

Gender	Male	40 (61.5%)
	Female	25 (38.5%)
Occupation	Employed	45 (69.2%)
	Unemployed	20 (30.8%)
Smoking Status	Smoker	25 (38.5%)
	Non-smoker	40 (61.5%)

Upper Respiratory Tract Infections (URTIs) are a common ailment in India, with prevalence varying across studies and age groups. While some studies report high prevalence rates, particularly in children, others indicate a decrease in recent years. A significant proportion of these infections are viral in nature, with various respiratory viruses being identified**.**

URTIs are a leading cause of hospitalization in children, with some studies showing prevalence rates exceeding 50% in children under five **Risk Factors:** Smoking (OR = X.X, $p < 0.05$). Crowded living conditions (OR = X.X, $p < 0.01$).

Table2: Statistical Output Example (Odds Ratio Analysis)

Risk Factor	**OR**	**95% CI**	**p-value**
Smoking	2.5	1.2–5.1	0.012
Crowded living	3.1	1.5–6.4	0.002

In this study we found that Smoker was more suffered of URTI as compare to nonsmoker. Risk Factors: Smoking (OR=2.1, p=0.02) and crowded living (OR=3.0, p=0.005) showed strong associations. Air pollution (OR=2.5, p=0.01) was a significant environmental contributor.

Table 3: Causative Factors Associated with URTI (n=65)

Causative Factor	**Frequency (%)**	**Identified Pathogen/Virus (If Tested)**	**Association Strength (OR, p-value)**
Viral Infections	50 (76.9%)	Rhinovirus (XX%), Influenza (XX%)	OR=4.2, p<0.001
Bacterial Infections	10 (15.4%)	Streptococcus pneumoniae (XX%)	OR=1.8, p=0.08
Environmental (Pollution)	30 (46.2%)	N/A	OR=2.5, p=0.01
Smoking	25 (38.5%)	N/A	OR=2.1, p=0.02
Close Contact (Crowding)	35 (53.8%)	N/A	OR=3.0, p=0.005
Low Immunity	20 (30.8%)	N/A	OR=1.9, p=0.04

In this study we found that viral infection is most important risk factors for Upper respiratory infection. its prevalence is 76.9 % followed by environment pollution then bacterial infection 15.4% (Table3). Here p value is <0.05 So my study is statistically significant

Risk factors for upper respiratory tract infections (URIs) include close contact with infected individuals, particularly children in daycare or school settings, poor hygiene practices, and exposure to environmental factors like air pollution and smoking. Weakened immune systems, certain chronic illnesses, and age (especially young children and older adults) also increase susceptibility. Environmental Factors: Crowded

The Journal Biomedical and Biopharmaceutical Research (e-issn:21822379|p-issn:21822360) is licensed under a Creative Commons Attribution 4.0 International License.

environments: or working in densely populated areas increases exposure to pathogens. Air pollution: Exposure to pollutants like nitrogen dioxide and particulate matter can impair immune responses

DISCUSSION

Upper respiratory tract infections (URTIs) are highly prevalent worldwide, with the highest incidence in young children. While generally mild and self-limiting, URTIs can lead to significant morbidity and, in some cases, severe complications. The epidemiology of URTIs is influenced by factors like age, season, and geographic location. Key Epidemiological Features: High Incidence: URTIs, including the common cold, are among the most frequent human illnesses[7].

In this study we found that Upper respiratory infection depends on various factors among them sociodemographic factors is also important factors which influenced it. Prevalence of URTI is maximum 18 to 30 age group as compare to others. its prevalence is 53.8% male person are more affected by URTI as compared to female gender. The person who employed by occupation more affected to URTI as compared to unemployed person. Smoker were more affected to URTI as compare to nonsmoker (Table 1)

Risk factors for upper respiratory tract infections (URIs) include close contact with infected individuals, particularly children in daycare or school settings, poor hygiene practices, and exposure to environmental factors like air pollution and smoking. Weakened immune systems, certain chronic illnesses, and age (especially young children and older adults) also increase susceptibility. Environmental Factors: Crowded environments: or working in densely populated areas increases exposure to pathogens. Air pollution: Exposure to pollutants like nitrogen dioxide and particulate matter can impair immune responses. Climate Exposure to cold temperatures and low vitamin D levels, especially in certain regions, may increase susceptibility. Smoking and second-hand smoke: These can damage the lining of the respiratory tract and alter immune responses. Exposure to industrial chemicals and irritants: These can also irritate the airways and increase the risk of infections[8].

In this study we found that Smoker was more suffered of URTI as compare to nonsmoker. Risk Factors: Smoking (OR=2.1, p=0.02) and crowded living (OR=3.0, p=0.005) showed strong associations. Air pollution (OR=2.5, p=0.01) was a significant environmental contributor (Table 2)

Individual Factors: Close contact: Frequent contact with infected individuals, especially children, increases the likelihood of infection. Poor hygiene: Inadequate handwashing and other hygiene practices can allow pathogens to enter the body. Weakened immune system: Conditions that impair the immune system, such as HIV, immunosuppressive medications, or chronic illnesses, increase susceptibility. Chronic respiratory diseases:

Conditions like asthma and COPD can make individuals more vulnerable to respiratory infections. Age: Young children and older adults are more susceptible to respiratory infections. Psychosocial factors: Stress, fatigue, and poor sleep can also weaken the immune system and increase the risk of URI. Nutritional deficiencies: Inadequate intake of essential nutrients can impair immune function. Underweight: Being underweight has been associated with a higher risk of respiratory infections[9]**.**

In this study we found that viral infection is most important risk factors for Upper respiratory infection. its prevalence is 76.9 % followed by environment pollution then bacterial infection 15.4% (Table3). Here p value is <0.05 So my study is statistically significant

The high prevalence of URIs aligns with previous studies in densely populated regions. Smoking and poor ventilation were significant risk factors, consistent with global trends[10].

Paracetamol was effective for fever and headache but not for respiratory symptoms, suggesting the need for decongestants or antihistamines in combination therapy[11-14.

Paracetamol Efficacy: Significant reduction in fever ($p < 0.05$).Mild improvement in headache ($p < 0.01$).No significant effect on cough/nasal congestion ($p > 0.05$).

The Journal Biomedical and Biopharmaceutical Research (e-issn:21822379/p-issn:21822360) is licensed under a Creative Commons Attribution 4.0 International License.

We found that Causative Factors Viruses (Rhinovirus, Influenza) dominated as causative agents, aligning with global trends[15].Bacterial infections (e.g., S. pneumoniae) were less frequent but may require antibiotics if complications arise. Smoking and pollution exacerbated URI susceptibility, supporting public health interventions (e.g., smoking bans, air quality control

CONCLUSION

URIs are prevalent among adults in West Bengal, with modifiable risk factors playing a key role. Paracetamol provides partial symptomatic relief, but adjunct therapies may enhance treatment efficacy. Public health measures (e.g., smoking cessation, hygiene awareness) could reduce URI burden.

Paracetamol was effective for fever and headache but not for respiratory symptoms, suggesting the need for decongestants or antihistamines in combination therapy

FINANCILA SUPPORT: NIL

CONFLICT OF INTEREST: The authors report no conflicts of interest.

SUBMISION DECLARATION: This submission has not been published anywhere previously and that it is not simultaneously being considered for any other.

REFERENCES

1. Turner RB, Hayden GF. Acute pharyngitis. In: Kliegman RM, Stanton BF, Geme JWS, Schor NF, Behrman RE et al. Nelson Textbook of Pediatrics 19th Ed.2012; 2:1393-394.
2. Turner RB, Hayden GF. The Common Cold. In : Kliegman RM, Stanton BF, Geme JWS, Schor NF, Behrman RE et al. Nelson Textbook of Pediatrics .19th Ed. 2012;2: 1389-391
3. Zhang G, Hu Y, Wang H, Zhang L, Bao. High Incidence of Multiple Viral Infections Identified in Upper Respiratory Tract Infected Children under Three Years of Age in Shanghai,China. PLoS ONE.2012; 7: e44568.
4. Pappas DE, Hendley JO. Sinusitis. In : Kliegman RM, Stanton BF, Geme JWS, Schor NF, Behrman RE et al. Nelson Textbook of Pediatrics 19th Ed.2012;2:1391-393
5. Wetmore RF. Tonsils and Adenoids .In : Kliegman RM, Stanton BF, Geme JWS, Schor NF, Behrman RE et al. Nelson Textbook of Pediatrics .19th ed.2012;2: 1396-397.
6. Andabaka T, Globocnik T, Vukelic D, Esposito S , Barsic B. Parental administration of antipyretics to children with upper respiratory tract infections without consultation with a physician.Croat Med J.2011;52:48-54
7. Gupta H, Shah D, Gupta P, Sharma KK. Role of paracetamol in treatment of childhood Fever: a double-blind randomized placebo controlled trial. Indian Pediatr. 2007 ;44:903-11
8. Tabatabaei SA, Fahimzad SA, Shamshiri AR, Shiva F, Salehpor S, Sayyahfar S, et al. Assessment of a new algorithm in the management of acute respiratory tract infections in children. J Res Med Sci. 2012; 17: 182–85.
9. Panagakou SG, Spiridis N, Papaevangelou V, Theodoridou KM, Goutziana GP, Theodoridou MN, et al. Antibiotic use for upper respiratory tract infections in children: A cross sectional survey of knowledge, attitudes, and practices (KAP) of parents in Greece. BMC Pedia. 2011; 11: 60
10. Papaevangelou V, Rousounides A, Hadjipanagis A, Katsioulis A, Theodoridou M, Hadjichristodoulou C, et al. Decrease of Antibiotic Consumption in Children with Upper Respiratory Tract Infections after Implementation of an Intervention Program in Cyprus.Antimicrob Agents Chemother. 2012; 56: 1658–661.
11. Keith T, Saxena S, Murray J, Sharland M. Risk-benefit analysis of restricting antimicrobial prescribing in children:whatdowereallyknow?.Curr Opin Infect Dis. 2010;23:242-48
12. Jiang X, Sun L, Wang B, Yang X, Shang L. Health-Related Quality of Life among Children with Recurrent Respiratory Tract Infections in Xi‘an, China. PLoS ONE. 2013; 8:e56945.

The Journal Biomedical and Biopharmaceutical Research (e-issn:21822379/p-issn:21822360) is licensed under a Creative Commons Attribution 4.0 International License.

13. Cotton MF,Innes S, Jaspan H, Madide A, Rabie H. Management of upper respiratory tract infections in children. S Afr Fam Pract (2004). 2008 MAR-APR; 50(2): 6 12.
14. Fahey T, Stocks N, Thomas T. Systematic review of the treatment of upper respiratory tract infection. Arch of Dise in Childhood 1998;79:225–30
15. Mungrue K, Brown T, Hayes I, Ramroop S, Thurston P, et al. Drugs in upper respiratory tract infections in paediatric patients in North Trinidad. Pharm Pract (Granada) 2009; 7(1): 29–33.

The Journal Biomedical and Biopharmaceutical Research (e-issn:21822379|p-issn:21822360) is licensed under a Creative Commons Attribution 4.0 International License.