

UPPER RESPIRATORY TRACT INFECTION: TREATMENT GUIDELINES

Fathima Basheera M.^{1*}, Natarajan P.², Dhanasekaran M.³, Dheena Dhayalan P.⁴, Ganga Dharshini R.⁵, Jeya Shree S.⁶

¹Associate Professor, Department of Pharmacology and Pharmacy Practice, Sankaralingam Bhuvanewari College of Pharmacy, Anaikuttam, Sivakasi, Tamil Nadu.

²HOD, Department of Pharmacology and Pharmacy Practice, Sankaralingam Bhuvanewari College of Pharmacy, Anaikuttam, Sivakasi, Tamil Nadu.

^{3,4,5,6}Final Year B. Pharm Student Sankaralingam Bhuvanewari College of Pharmacy, Anaikuttam, Virudhunagar.

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***Corresponding Author: Fathima Basheera M.**

Associate Professor, Department of Pharmacology and Pharmacy Practice, Sankaralingam Bhuvanewari College of Pharmacy, Anaikuttam, Sivakasi, Tamil Nadu.



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ABSTRACT

Upper respiratory tract infections (URTIs) are among the most common infectious diseases worldwide and represent a significant cause of morbidity across all age groups. URTIs affect structures including the nasal cavities, sinuses, pharynx, and larynx. These infections are mainly viral in origin, though bacterial pathogens may contribute to complications or secondary infections. URTIs result in substantial healthcare utilization, absenteeism from work and school, and increased economic burden. Risk factors include environmental pollution, overcrowding, smoking, and poor nutritional status. Management primarily focuses on symptomatic treatment, preventive strategies, and rational antibiotic use to prevent resistance. This review summarizes the epidemiology, etiology, pathophysiology, clinical features, diagnosis, management, and preventive measures of URTIs.

KEYWORDS: Upper respiratory tract infection, viral infection, rhinitis, sinusitis, antibiotic resistance, respiratory disease.

1. INTRODUCTION

Upper respiratory tract infections are defined as infections involving the airways above the vocal cords, including the nose, paranasal sinuses, pharynx, and larynx. URTIs include common colds, pharyngitis, sinusitis, laryngitis, and tonsillitis. These infections are highly prevalent and are a major cause of outpatient visits globally.^[1,2,3]

Acute respiratory infections collectively account for a significant proportion of healthcare utilization. In India alone, millions of cases are reported annually, contributing to a high disease burden and increased hospital visits. Acute respiratory infections contribute to approximately 30–60% of outpatient consultations and

20–40% of pediatric hospital admissions, indicating their public health significance.^[4,5]

URTIs are generally self-limiting; however, complications such as otitis media, sinusitis, and lower respiratory tract infections can occur, especially in vulnerable populations like children, elderly individuals, and immuno-compromised patients.^[6,7]

2. Epidemiology

URTIs occur globally and affect individuals of all age groups. Children experience more frequent infections due to immature immunity and increased exposure in schools and daycare settings. Studies show that acute respiratory infections significantly contribute to

childhood morbidity and mortality, especially in developing countries.^[8,9]

Socioeconomic factors play a major role in URTI prevalence. Overcrowded living conditions, poor sanitation, and indoor air pollution are associated with increased infection rates.^[10,11] Children from lower socioeconomic backgrounds and those exposed to environmental pollutants demonstrate higher susceptibility to respiratory infections.^[8,13]

Seasonal variation also influences URTI incidence, with increased cases observed during colder months.^[14] Urban populations often show higher prevalence due to pollution exposure and population density.^[15,16]

3. Etiology

URTIs are predominantly caused by viral pathogens, though bacterial infections may occur.

3.1 Viral Causes

Viruses are responsible for approximately 70–90% of URTI cases.^[17]

Common viral pathogens include:

- Rhinovirus
- Coronavirus
- Influenza virus
- Parainfluenza virus
- Respiratory syncytial virus (RSV)
- Adenovirus.^[16,17]

Rhinovirus is considered the most common causative agent, particularly in common cold infections.^[18]

3.2 Bacterial Causes

Bacterial pathogens usually cause secondary infections or complications.^[19,20] Common bacteria include:

- *Streptococcus pyogenes*
- *Streptococcus pneumoniae*
- *Haemophilus influenza*
- *Moraxella catarrhalis*.^[19,21]

Understanding microbial profiles is essential for appropriate antimicrobial therapy and prevention of resistance development.^[20,22]

4. Pathophysiology

URTIs occur when pathogens enter the respiratory tract through inhalation or direct contact.^[1,2] Viral pathogens attach to respiratory epithelial cells and replicate, causing mucosal inflammation and immune activation.^[1,23] This results in increased mucus production, congestion, and tissue irritation.^[2,23]

Inflammatory mediators such as cytokines contribute to systemic symptoms including fever and malaise.^[23,24] Secondary bacterial infections may occur due to impaired mucociliary clearance and compromised immune response.^[24,25]

Environmental factors such as smoking and occupational exposure to dust and pollutants further increase susceptibility by damaging respiratory epithelium and impairing immune defences.^[25,26]

5. Risk Factors

Several factors increase the risk of URTIs^[27,28]:

- Overcrowding and poor ventilation
- Exposure to indoor and outdoor air pollution.^[28,29]
- Smoking and passive smoking.^[28,30]
- Malnutrition.^[29,31]
- Occupational exposure to dust and chemicals.^[30,32]
- Weakened immune system
- Poor hygiene practices.^[27,29]

Occupational exposure to dust and fumes has been linked to increased respiratory morbidity. Workers exposed to silica dust and cement fumes demonstrate a higher incidence of respiratory infection.^[31,32]

6. Clinical Features

The symptoms of URTIs vary depending on the affected anatomical site but commonly include.^[1,2]

6.1 Common Symptoms

- Nasal congestion
- Rhinorrhoea
- Sneezing
- Sore throat
- Cough
- Fever
- Headache
- Malaise

6.2 Condition-Specific Symptoms

Common Cold

- Mild fever
- Hoarseness of voice
- Dry cough.^[33]

7. Diagnosis

URTIs are primarily diagnosed clinically based on symptoms and physical examination. Laboratory investigations are generally unnecessary unless complications are suspected.^[1,34]

7.1 Clinical Assessment

- Patient history
- Symptom duration and severity
- Physical examination of throat and nasal cavity.^[34]

7.2 Laboratory Tests

- Throat swab culture (for bacterial pharyngitis)
- Rapid antigen detection test
- Viral PCR testing (in severe or outbreak situations).^[34,35]

Radiological imaging may be required in cases of suspected sinusitis or complications.^[35]

8. Management

8.1 Symptomatic Treatment

Since most URTIs are viral, treatment focuses on symptom relief^[1,2]:

- Analgesics and antipyretics
- Decongestants
- Antihistamines
- Adequate hydration
- Rest.^[2,33]

8.2 Antibiotic Therapy

Antibiotics are recommended only in confirmed bacterial infections. Irrational antibiotic use contributes to antimicrobial resistance and increased healthcare costs.^[33,35]

8.3 Supportive Therapy

- Steam inhalation
- Saline nasal irrigation
- Nutritional support.^[22,34]

9. Complications

URTIs are usually self-limiting but may lead to complications such as otitis media, sinusitis, bronchitis, and pneumonia.^[33,35]

10. Prevention

Preventive strategies reduce incidence and transmission of URTIs through hygiene, environmental control, and vaccination.^[36,37]

Hand hygiene significantly reduces transmission of respiratory pathogens, while respiratory etiquette and avoiding face touching reduce infection spread.^[38,40] Smoking cessation and good nutrition improve immune defence.^[37]

Vaccination, particularly influenza immunization, reduces disease severity and hospitalization.^[38] Healthcare worker vaccination reduces nosocomial transmission.^[37]

Environmental measures such as ventilation and reducing indoor pollution decrease airborne transmission risk.^[36,37]

10.1 Vaccination

Vaccines against influenza significantly reduce infection risk in high-risk groups.^[38]

11. Public Health Importance

URTIs contribute significantly to healthcare burden and economic loss due to absenteeism and treatment costs.^[37,38]

12. CONCLUSION

URTIs are among the most common infectious diseases globally. Viral pathogens are the primary cause, and management is mainly symptomatic. Prevention through

hygiene, vaccination, and environmental control is essential.^[37,38]

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