

UNDERSTANDING PAROXYSMAL SNEEZING: THE IMPACT OF ALLERGENS AND IRRITANTS

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ABSTRACT

Paroxysmal sneezing, a condition characterised by sudden and intense bursts of sneezing that occur in rapid succession, represents a significant yet under recognised health issue. These sneezing episodes are often triggered by various environmental factors, including allergens such as pollen, dust mites, and animal dander, as well as non-allergic irritants like smoke, pollution, and strong odours. This reflexive action can significantly impair an individual's daily life and overall well-being, leading to discomfort and social embarrassment. The etiology of paroxysmal sneezing is multifaceted, involving both allergic and non-allergic stimuli, as well as psychological triggers, which can exacerbate the frequency and severity of sneezing episodes. The management of paroxysmal sneezing typically involves a combination of strategies aimed at identifying and avoiding specific triggers. Pharmacological interventions, including antihistamines, nasal corticosteroids, and decongestants, play a crucial role in controlling symptoms. In severe cases, surgical options, such as septoplasty or turbinate reduction, may be considered to address structural abnormalities in the nasal passages that contribute to chronic sneezing. Preventive measures are also essential, focusing on reducing exposure to known allergens and irritants, as well as maintaining an environment conducive to minimizing sneezing triggers. This review seeks to provide a comprehensive examination of the factors contributing to paroxysmal sneezing, its prevalence, and the current approaches to prevention and treatment.

Keywords: Paroxysmal Sneezing, Allergens, Irritants, Antihistamines, Preventive Strategies, Nasal Corticosteroids, Surgical Interventions

INTRODUCTION

Paroxysmal sneezing, defined as sudden and intense bursts of sneezing that occur in rapid succession, represents a complex reflexive response often triggered by various stimuli, including allergens, irritants, or even psychological factors. Unlike typical sneezing, which occurs sporadically, paroxysmal sneezing is characterized by a rapid sequence of sneezes, which can sometimes number in the dozens. This reflex involves the activation of sensory receptors in the nasal mucosa, which then transmit signals through the nervous system, ultimately resulting in a forceful expulsion of air from the lungs through the nasal passages. This phenomenon, while typically benign, can significantly impact an individual's quality of life, leading to physical discomfort, social embarrassment, and interruptions in daily activities.

Additionally, recognizing psychological factors that may exacerbate sneezing episodes can inform a more holistic approach to treatment. The broad spectrum of triggers and their varying impacts on individuals necessitates a personalised approach to managing this condition, highlighting the importance of patient education and tailored therapeutic strategies.[1]

HISTORICAL CONTEXT

Historically, sneezing has been documented as a reflexive response in humans since ancient times. The phenomenon of sneezing and its causes have been referenced in various medical texts across cultures. In ancient Greece, sneezing was considered a divine sign, with Hippocrates suggesting that it was the body's way of expelling harmful substances. Similarly, in Ayurvedic medicine, sneezing was viewed as a means to clear the respiratory passages and was often treated with herbal remedies.

The recognition of sneezing as a reflex related to both respiratory and neurological functions dates back to the 19th century. Early medical practitioners began to distinguish between different types of sneezing, noting the differences between allergic sneezing and sneezing caused by irritants or infections. The advent of modern allergy testing in the mid-20th century further contributed to the understanding of paroxysmal sneezing, particularly its association with allergic rhinitis. Since then, the condition has been recognized as a significant health issue, though it remains underdiagnosed and undertreated in many populations. **DEFINITION**

Paroxysmal sneezing refers to sudden, intense sneezing episodes that occur rapidly and are typically involuntary. These episodes can last from a few seconds to several minutes and are often triggered by exposure to specific allergens or irritants. The term "paroxysmal" emphasizes the sudden onset and severity of these sneezing episodes, distinguishing them from more typical, sporadic sneezing that may occur in response to minor irritants. [2]

REVIEW OF LITERATURE

1. Chronology of Research

The study of sneezing as a reflexive response has evolved significantly over time. Early references to sneezing in ancient medical texts primarily focused on its role as a protective mechanism, with little distinction made between different types of sneezing. It was not until the 19th century that medical practitioners began to categorize sneezing based on its triggers, distinguishing between allergic and non-allergic sneezing.

In the early 20th century, advances in immunology led to the identification of specific allergens responsible for allergic rhinitis, a condition closely associated with paroxysmal sneezing. The development of skin prick testing and blood tests for allergen-specific IgE marked significant progress in diagnosing allergic causes of sneezing. During the latter half of the 20th century, the role of environmental irritants, infections, and neurological factors in triggering sneezing became more widely recognized.

Recent research has focused on the complex interplay between these various triggers, as well as the development of targeted treatments to manage paroxysmal sneezing. Studies have explored the efficacy of pharmacological interventions, such as antihistamines and nasal corticosteroids, as well as surgical options for structural abnormalities that contribute to chronic sneezing.[3]

2. Thematic Analysis

- Allergic Triggers

The most common cause of paroxysmal sneezing is exposure to allergens. Allergic rhinitis, also known as hay fever, is characterized by an exaggerated immune response to environmental allergens such as pollen, dust mites, mould spores, and animal dander. When these allergens enter the nasal passages, they trigger the release of histamines, which cause inflammation, itching, and sneezing. Studies have shown that antihistamines, which block the action of histamine, are effective in reducing the severity of allergic sneezing. Additionally, nasal corticosteroids have been found to reduce inflammation in the nasal passages, providing relief for individuals with chronic allergic rhinitis.

- Non-Allergic Triggers

In addition to allergens, paroxysmal sneezing can be triggered by non-allergic factors such as irritants and psychological stimuli. Irritants like smoke, pollution, strong odours, and sudden temperature changes can provoke sneezing by irritating the nasal mucosa. Non-allergic rhinitis, also known as vasomotor rhinitis, is a condition in which the nasal passages become inflamed in response to these irritants, leading to sneezing and congestion. Behavioural factors, such as stress or excitement, can also trigger sneezing in some individuals, suggesting a neurological component to the condition.

- Neurological Factors

Neurological factors play a significant role in the sneezing reflex. The trigeminal nerve, which

innervates the nasal passages, is responsible for transmitting signals that trigger sneezing in response to irritants or allergens. Certain neurological conditions, such as trigeminal neuralgia or epilepsy, can lead to abnormal activation of the sneezing reflex, resulting in paroxysmal sneezing. Research has also identified a condition known as photic sneezing, where individuals sneeze in response to bright light, suggesting a neurological link between visual stimuli and the sneezing reflex.

- Current State of the Field

The current state of research on paroxysmal sneezing highlights the complexity of the condition and the need for a multifaceted approach to management. While significant progress has been made in understanding the allergic and non-allergic triggers of sneezing, more research is needed to explore the neurological mechanisms underlying the sneezing reflex. The development of more effective treatments, particularly for non-allergic and idiopathic cases of paroxysmal sneezing, remains a priority.

Pharmacological treatments, including antihistamines, nasal corticosteroids, and decongestants, are commonly used to manage symptoms. Additionally, preventive measures, including allergen avoidance and environmental control, are crucial in reducing the frequency and severity of sneezing episodes.[8]

IMPORTANCE OF UNDERSTANDING ITS TRIGGERS AND IMPACTS

Understanding the triggers and impacts of paroxysmal sneezing is crucial for several reasons. Identifying specific allergens or irritants that provoke these episodes can help in diagnosing and managing underlying conditions such as allergic rhinitis, non-allergic rhinitis, or other respiratory disorders. Knowledge of these triggers allows for targeted avoidance strategies, potentially reducing the frequency and severity of sneezing episodes. Moreover, frequent paroxysmal sneezing can significantly impact an individual's quality of life. It may lead to physical discomfort, social embarrassment, and interruptions in daily activities. In severe cases, it can cause complications such as nasal irritation, headaches, or even respiratory distress. Understanding the mechanisms behind this condition also contributes to better treatment options, including medications or lifestyle modifications that can alleviate symptoms.

CLASSIFICATION

Paroxysmal sneezing can be classified into several categories based on the underlying triggers and the nature of the sneezing episodes:

Allergic Paroxysmal Sneezing: Triggered by exposure to allergens such as pollen, dust mites, mould, or animal dander. This type of sneezing is often associated with allergic rhinitis and other allergic conditions. The immune system's overreaction to harmless substances leads to the release of histamines, which in turn causes inflammation and sneezing as a protective reflex.[4]

Non-Allergic Paroxysmal Sneezing: Triggered by irritants such as strong odors, smoke, pollution, or

sudden temperature changes. This category can also include sneezing due to psychological factors like stress or excitement. Non-allergic rhinitis, often referred to as vasomotor rhinitis, can manifest through this type of sneezing, which is not mediated by the immune system in the same way as allergic sneezing.[3]

Idiopathic Paroxysmal Sneezing: Occurs when no identifiable trigger is found. In such cases, the sneezing episodes may be attributed to an overactive sneezing reflex or heightened sensitivity of the nasal mucosa. This classification is often a diagnosis of exclusion, made after ruling out other potential causes.[5]

This classification system is important for guiding treatment decisions, as the underlying cause of the sneezing episodes often dictates the most appropriate therapeutic approach. For example, allergic paroxysmal sneezing may respond well to antihistamines and allergen avoidance, while non-allergic sneezing might require the use of nasal corticosteroids or avoidance of irritants.

ETIOLOGY

The etiology of paroxysmal sneezing is multifactorial, encompassing a range of potential triggers that can vary significantly between individuals. Key etiological factors include:

Allergens: Substances like pollen, dust mites, mold spores, and animal dander can trigger allergic reactions, leading to sneezing. These allergens are common in both indoor and outdoor environments, making it challenging to completely avoid exposure. Seasonal variations, such as the prevalence of pollen during spring and fall, often exacerbate symptoms in susceptible individuals.[6]

Irritants: Strong smells, pollution, smoke, and other environmental factors can irritate the nasal passages and trigger sneezing. Chemical irritants, such as those found in cleaning products, perfumes, and industrial chemicals, are particularly potent triggers. Additionally, physical irritants like dust and particulate matter from pollution can cause mechanical irritation of the nasal mucosa.⁷

Infections: Respiratory infections, such as the common cold or influenza, can cause sneezing as a symptom. Viral infections lead to inflammation and increased mucus production in the nasal passages, which can activate the sneezing reflex as the body attempts to clear the irritants.[8]

Neurological Factors: Certain neurological conditions or stimuli can provoke sneezing reflexes. For example, photic sneezing, a reflexive response to sudden exposure to bright light, is believed to be neurologically mediated. Other neurological disorders, such as epilepsy or trigeminal neuralgia, may also involve abnormal activation of the sneezing reflex.

These diverse etiological factors highlight the complexity of paroxysmal sneezing and underscore the importance of a thorough diagnostic evaluation to identify the underlying cause. Understanding the specific triggers for each individual is crucial for developing an effective treatment plan.[9]

RISK FACTORS

Several risk factors have been identified that may increase an individual's likelihood of experiencing paroxysmal sneezing:

History of Allergies: Individuals with a history of allergic reactions are more prone to sneezing episodes. Allergic rhinitis, also known as hay fever, is a common condition that predisposes individuals to paroxysmal sneezing, especially in response to airborne allergens like pollen or dust mites.

Environmental Exposure: Frequent exposure to allergens or irritants increases the risk of paroxysmal sneezing. Those who live in urban areas with high levels of air pollution, or who work in environments with significant exposure to dust, chemicals, or other irritants, are at higher risk.[4]

Genetics: A family history of allergies or asthma can predispose individuals to similar conditions. Genetic factors may influence the sensitivity of the nasal mucosa and the immune system's response to allergens, making some individuals more susceptible to sneezing episodes.

Age and Gender: While sneezing can affect anyone, some studies suggest that young adults and females may be more susceptible. Hormonal fluctuations, particularly during pregnancy or menstruation, may exacerbate sneezing in women. Additionally, younger individuals may be more likely to develop allergic rhinitis, which is closely associated with paroxysmal sneezing.[7]

Occupational Hazards: Jobs that involve exposure to chemicals, dust, or other irritants, such as farming, construction, or hairdressing, can increase the risk of paroxysmal sneezing. Occupational asthma, which is often triggered by workplace allergens or irritants, can also manifest with symptoms of paroxysmal sneezing.[8]

Recognizing these risk factors can help in the early identification and management of paroxysmal sneezing, potentially reducing the severity and frequency of episodes through targeted interventions.

MECHANISMS OF PAROXYSMAL SNEEZING

Physiological and Neurological Pathways Involved

1. Sensory Receptors in the Nasal Mucosa

The nasal mucosa is lined with sensory nerve endings that detect irritants, allergens, or foreign particles. These nerve endings are sensitive to various stimuli, including chemical, thermal, and mechanical irritants.[10]

2. Activation of the Trigeminal Nerve

Upon detecting a trigger, the sensory receptors in the nasal mucosa send signals to the trigeminal nerve, which is responsible for conveying sensory information from the face and nasal cavity to the brain. The trigeminal nerve acts as the primary pathway for transmitting the sensation of irritation.[11]

3. Signal Transmission to the Brain:

The signals from the trigeminal nerve are relayed to the brainstem, specifically to the medulla oblongata. This area of the brain is involved in controlling reflex actions, including sneezing.

4. *Sneezing Reflex Arc:*

In the brainstem, the information is processed and integrated, leading to the activation of a reflex arc. This reflex arc triggers the motor neurons, which then stimulate the muscles involved in sneezing, including the diaphragm, intercostal muscles, and muscles in the pharynx and larynx.[12]

The Body's Response to Sneezing Triggers

1. *Initial Irritation and Sensory Detection:*

When an irritant or allergen comes into contact with the nasal mucosa, it activates the sensory receptors. This initial detection is crucial for triggering the body's defensive response.

2. *Nervous System Activation:*

The activation of sensory receptors leads to the transmission of electrical signals via the trigeminal nerve to the brainstem. Here, the signals are interpreted as an irritation that needs to be expelled from the nasal passages.

3. *Muscular Coordination and Reflex Activation:*

The brainstem responds by coordinating a complex series of muscular contractions. The soft palate rises, the vocal cords close partially, and the diaphragm and chest muscles contract forcefully. This coordinated effort results in a rapid expulsion of air from the lungs through the nose and mouth.

4. *Expulsion of Irritants:*

The forceful expulsion of air during a sneeze helps to clear the nasal passages of the irritants or allergens that triggered the reflex. This is the body's way of protecting the respiratory system from potentially harmful substances.[13]

CLINICAL MANIFESTATION

- **Nasal Congestion:** Often accompanies sneezing, especially in cases related to allergic rhinitis. Congestion occurs due to the swelling of the nasal passages, which restricts airflow and may lead to a sensation of fullness or pressure in the nose.
- **Runny Nose (Rhinorrhoea):** Excessive mucus production is common, particularly in allergic or infectious cases. The mucus may be clear or colored, depending on the underlying cause, and can contribute to further irritation and sneezing.
- **Itchy Eyes or Nose:** Common in allergic cases, where histamine release leads to itching. The itching may extend to the throat or ears, further exacerbating discomfort and leading to additional sneezing.

- **Fatigue:** Repeated sneezing can lead to physical exhaustion, especially if episodes are frequent or severe. The physical act of sneezing requires significant muscle effort, and repeated episodes can cause fatigue, particularly in individuals who experience prolonged or intense sneezing bouts.
- **Headaches:** The force of repeated sneezing can lead to headaches or facial pain, especially if the nasal congestion is severe. Sinus pressure and tension headaches are common secondary symptoms in individuals who suffer from frequent paroxysmal sneezing. [14].

COMPLICATIONS

Complications arising from paroxysmal sneezing can significantly impact an individual's health and quality of life. These complications may range from physical discomfort to more serious health issues, depending on the severity and frequency of sneezing episodes. Below are detailed descriptions of potential complications:

- **Physical Discomfort and Fatigue**

Frequent sneezing can lead to physical discomfort, particularly in the upper respiratory tract. Individuals may experience soreness in the throat due to the repetitive forceful expulsion of air. Additionally, sneezing can cause muscle strain, particularly in the chest, diaphragm, and intercostal muscles. This muscle fatigue can lead to general exhaustion, especially in cases where sneezing episodes are prolonged or frequent.

- **Headaches and Facial Pain**

Paroxysmal sneezing can trigger tension headaches and facial pain, particularly in the sinus regions. The repetitive, forceful action of sneezing can increase intracranial pressure, leading to headaches that may persist beyond the sneezing episodes. The increased pressure in the sinus cavities can also exacerbate sinusitis symptoms or contribute to the development of sinus infections.

- **Nasal Irritation and Damage**

Repeated sneezing can cause significant irritation of the nasal passages. The force of frequent sneezing can lead to inflammation and swelling of the nasal mucosa, which may result in persistent nasal congestion or a runny nose. Over time, this can cause damage to the delicate tissues inside the nose, potentially leading to nosebleeds (epistaxis) or chronic nasal dryness.

- **Sleep Disturbances**

Severe or frequent episodes of paroxysmal sneezing can disrupt sleep, leading to insomnia or poor sleep quality. This disruption may be due to the physical discomfort caused by sneezing, as well as the potential for sneezing episodes to occur during the night. Chronic sleep deprivation resulting from these disturbances can lead to a host of other health issues, including increased stress, impaired cognitive function, and weakened immune response.

- **Respiratory Issues**

In some cases, paroxysmal sneezing can aggravate existing respiratory conditions, such as asthma or chronic obstructive pulmonary disease (COPD). The act of forceful sneezing can cause bronchospasms or exacerbate airway inflammation, leading to difficulty breathing or wheezing. Additionally, sneezing may lead to secondary infections, such as bronchitis or pneumonia, particularly if the nasal congestion associated with sneezing is not properly managed.

- **Psychological and Social Impacts**

The social and psychological impacts of paroxysmal sneezing should not be underestimated. Frequent sneezing can be socially embarrassing, leading to anxiety, stress, and even depression. Individuals may become self-conscious about their symptoms, avoiding social interactions or public places for fear of sneezing episodes. This social withdrawal can contribute to feelings of isolation and negatively affect mental health.

- **Impaired Daily Functioning**

Severe or frequent sneezing episodes can interfere with daily activities, including work, school, and personal responsibilities. The sudden onset of sneezing can disrupt concentration and productivity, making it difficult for individuals to complete tasks. In some cases, the need to constantly manage symptoms with medication or avoidance strategies can be time-consuming and burdensome, further impacting quality of life.

- **Long-Term Health Implications**

If not properly managed, chronic paroxysmal sneezing can lead to long-term health implications. Persistent inflammation of the nasal passages can result in chronic rhinitis or the development of nasal polyps, which may require surgical intervention. Additionally, the strain on the respiratory and cardiovascular systems caused by frequent sneezing could potentially contribute to more serious health issues over time.

- **Impact on Immune Function**

Frequent episodes of paroxysmal sneezing can weaken the immune system, particularly if the underlying cause is related to chronic exposure to allergens or irritants. The body's continuous response to these triggers can lead to immune system fatigue, making the individual more susceptible to infections and illnesses.

- **Potential for Secondary Infections**

The inflammation and damage caused by frequent sneezing can create an environment conducive to secondary infections. For instance, persistent nasal congestion and mucosal irritation can trap bacteria in the nasal passages, leading to sinusitis. Similarly, the disruption of normal nasal function can impair the body's ability to filter and expel pathogens, increasing the risk of upper respiratory tract infections.

- **Hearing Issues**

The forceful nature of sneezing can occasionally affect the Eustachian tubes, which connect the middle ear to the nasopharynx. This can lead to a temporary feeling of fullness in the ears, mild hearing loss, or even ear infections if the pressure in the Eustachian tubes becomes imbalanced. Chronic sneezing may also exacerbate pre-existing ear conditions, such as tinnitus.

- **Impact on Cardiovascular Health**

Frequent sneezing, particularly when associated with allergic reactions, can have an impact on cardiovascular health. The body's response to allergens involves the release of histamines, which can cause blood vessels to dilate and lead to changes in heart rate and blood pressure. In individuals with pre-existing cardiovascular conditions, these changes can exacerbate symptoms such as palpitations or lead to more serious complications.

- **Gastroesophageal Reflux Disease (GERD)**

Frequent sneezing, especially when combined with coughing, can increase intra-abdominal pressure, potentially exacerbating conditions like gastroesophageal reflux disease (GERD). The increased pressure can cause stomach acid to reflux into the oesophagus, leading to heartburn and other symptoms associated with GERD.

- **Cognitive Effects**

The persistent discomfort and distraction caused by frequent sneezing can affect cognitive function. Individuals may experience difficulty concentrating, memory problems, and a general decline in mental sharpness due to the constant interruption and discomfort associated with their symptoms. Over time, this cognitive impairment can affect work performance, academic achievement, and overall quality of life.

- **Post-Sneeze Injuries**

In rare cases, the sudden and forceful nature of a sneeze can lead to injuries. For example, individuals may experience a muscle strain in the chest, back, or neck. In extreme cases, particularly in individuals with pre-existing conditions, sneezing can even result in a vertebral compression fracture, especially if there is an underlying condition like osteoporosis. There have also been instances where individuals have sustained a pneumothorax (collapsed lung) due to the pressure generated during a particularly forceful sneeze.

- **Secondary Sinus Infections**

Chronic sneezing due to unresolved allergic or irritant exposure can lead to ongoing inflammation of the sinuses. This inflammation creates a breeding ground for bacteria, potentially leading to recurrent or chronic sinus infections (sinusitis). These infections may require prolonged antibiotic treatment and can sometimes necessitate surgical intervention if they become severe.

- **Barotrauma**

The pressure changes in the nasal and sinus cavities during forceful sneezing can cause barotrauma, a condition where tissues are damaged due to differences in pressure. This can affect the ears, causing pain or even a ruptured eardrum, or the sinuses, leading to sinus pain and pressure. Barotrauma is more likely to occur in individuals with underlying sinus or ear conditions.

- **Impact on Vision**

While rare, severe sneezing can have effects on the eyes, such as causing subconjunctival haemorrhage (a burst blood vessel in the eye). This occurs when the pressure from sneezing is transmitted to the blood vessels in the eyes, leading to a small amount of bleeding. Though typically harmless, it can be alarming and may require medical attention if it recurs frequently.

- **Potential for Cardiopulmonary Stress**

In individuals with pre-existing cardiopulmonary conditions, the strain of frequent sneezing can exacerbate symptoms like shortness of breath, chest pain, or even angina. The physical exertion involved in sneezing may also increase the risk of acute cardiovascular events in vulnerable populations, such as those with coronary artery disease[15].

ROLE OF ALLERGENS

Common Allergens that provoke sneezing;

Paroxysmal sneezing is often triggered by exposure to common allergens. These include pollen from trees, grasses, and weeds, which is a prevalent cause of seasonal allergic rhinitis, commonly known as hay fever. Dust mites, microscopic organisms found in household dust, are another frequent trigger, especially in humid environments where they thrive. Animal dander, consisting of tiny flakes of skin shed by cats, dogs, and other pets, can also provoke allergic reactions in sensitive individuals. Other notable allergens include mould spores, which are particularly problematic in damp conditions, and certain foods or medications that can trigger allergic responses in some people.[16]

INFLUENCE OF IRRITANTS

Chemical and Physical Irritants

In addition to allergens, various chemical and physical irritants can induce paroxysmal sneezing. Common irritants include smoke from tobacco or wood fires, air pollution containing particulate matter, and strong odours from perfumes, cleaning agents, or volatile organic compounds (VOCs). These substances can irritate the mucous membranes of the nasal passages, triggering the sneezing reflex as the body attempts to expel the irritants.

Occupational and Environmental Exposure to Irritants

Occupational exposure to irritants is a significant concern for individuals working in certain industries. For example, workers in manufacturing, agriculture, or construction may be -exposed to dust, chemicals, or fumes that can provoke respiratory symptoms, including sneezing. Environmental factors such as urban air pollution or indoor air quality in poorly ventilated spaces also contribute to the frequency of sneezing episodes. Studies have shown that individuals living in highly polluted areas report more frequent respiratory symptoms, highlighting the need for effective environmental regulations and personal protective measures.[17]

DIAGNOSTIC EVALUATION

- **Medical History:** A detailed history of the episodes, including triggers and associated symptoms.
- **Physical Examination:** Examination of the nasal passages and throat.
- **Allergy Testing:** Skin prick tests or blood tests to identify specific allergens.
- **Nasal Endoscopy:** To visualize the nasal cavity and identify any structural abnormalities or inflammation [18].

MEDICAL MANAGEMENT

♦ **Antihistamines:**

Antihistamines are commonly used to treat allergic symptoms like paroxysmal sneezing by blocking the effects of histamine in the body.

1. Chlorpheniramine Maleate (CPM)

- Adult Dosage: 4 mg every 4 to 6 hours (maximum 24 mg/day).
- Paediatric Dosage:
Children 2-6 years: 1 mg every 4 to 6 hours (maximum 6 mg/day).
- Children 6-12 years: 2 mg every 4 to 6 hours (maximum 12 mg/day).

2. Cetirizine

- Adult Dosage: 10 mg once daily.
- Paediatric Dosage:
- Children 2-6 years: 2.5 mg once daily (can be increased to 5 mg if needed).
- Children 6-12 years: 5 mg to 10 mg once daily.

3. Loratadine

- Adult Dosage: 10 mg once daily.
- Paediatric Dosage:
- Children 2-6 years: 5 mg once daily.

- Children 6-12 years: 10 mg once daily.

♦ Nasal Decongestants

Nasal decongestants relieve nasal congestion by shrinking swollen blood vessels in the nasal passages.

1. Oxymetazoline

- Adult Dosage: 2-3 sprays in each nostril every 12 hours.
- Paediatric Dosage:
 - Children 6-12 years: 1 spray in each nostril every 12 hours.
 - Not recommended for children under 6 years.

2. Phenylephrine

- Adult Dosage: 10 mg every 4 hours as needed.
- Paediatric Dosage:
 - Children 2-6 years: 2.5 mg every 4 hours as needed.
 - Children 6-12 years: 5 mg every 4 hours as needed.

3. Pseudoephedrine

- Adult Dosage: 60 mg every 4-6 hours (maximum 240 mg/day).
- Paediatric Dosage:
 - Children 4-6 years: 15 mg every 4-6 hours (maximum 60 mg/day).
 - Children 6-12 years: 30 mg every 4-6 hours (maximum 120 mg/day).[19]

NOTE: These medications should be used according to the dosage guidelines and under the advice of a healthcare provider to manage paroxysmal sneezing and other related symptoms effectively.

SURGICAL MANAGEMENT

Surgical interventions may be considered in cases where structural abnormalities in the nasal passages contribute to chronic sneezing, such as:

- **Septoplasty:** Correcting a deviated septum.
- **Turbinate Reduction:** Reducing the size of the turbinates to improve airflow.

NURSING MANAGEMENT

- **Patient Education:** Informing patients about potential triggers and preventive measures.
- **Symptom Management:** Assisting with the use of medications and nasal irrigation techniques.
- **Emotional Support:** Providing support for individuals who experience social embarrassment or anxiety due to their symptoms.

PREVENTIVE MEASURES AND LIFESTYLE CHANGES

Preventing sneezing episodes involves both avoiding known triggers and implementing lifestyle changes. For individuals allergic to pollen, staying indoors during high pollen seasons, using air purifiers, and regularly cleaning living spaces can reduce exposure. For dust mite allergies, measures such as using allergen-proof bedding, frequent washing of bed linens, and reducing indoor humidity levels are recommended. Avoiding exposure to known irritants, such as tobacco smoke or strong odours, is also crucial.

IMPLICATIONS FOR PUBLIC HEALTH AND INDIVIDUAL WELL-BEING

The widespread impact of allergens and irritants on respiratory health underscores the need for public health initiatives aimed at improving air quality and raising awareness about allergen avoidance. For individuals, managing exposure to known triggers can significantly enhance quality of life by reducing the frequency and severity of sneezing episodes.

CONCLUSION

Paroxysmal sneezing is a distinct yet underrecognized condition characterized by sudden and repeated episodes of sneezing, often triggered by a variety of allergens, irritants, or psychological factors. Despite its benign nature, it can significantly impact an individual's quality of life, causing discomfort and social inconvenience. The etiology of paroxysmal sneezing is diverse, encompassing allergic responses, environmental irritants, and even psychological influences. However, the exact incidence remains underreported, complicating the understanding of its prevalence and distribution.

Effective management of paroxysmal sneezing requires a comprehensive approach, including the identification and avoidance of triggers, pharmacological interventions such as antihistamines and corticosteroids, and in some cases, surgical options. Preventive strategies are essential and focus on minimizing exposure to known triggers and maintaining an allergen-free environment.²⁰

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