

2006 CE Series — Lesson Three

The Common Cold

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Goals and Objectives

Goals: To provide the pharmacist with information associated with the common cold.

Objectives: After completing this article the pharmacist should be able to:

1. Discuss etiologies of the common cold.
2. Describe the symptoms associated with the common cold.
3. Discuss the complications associated with the common cold.
4. Discuss each class of drugs used to treat the common cold.
5. Discuss the role of the pharmacist with regard to counseling patients with common cold.

The common cold, which is also known as coryza, acute rhinitis, infectious rhinitis, and cold, is responsible for about 20 percent of acute diseases in the United States. It is estimated that about 15 percent of the population per week in the United States suffer from the common cold. The variety of products used to treat the common cold and its related symptoms accounts for more than one billion dollars per year, while the costs associated with the occurrence of colds is approximately \$10 billion each year.

The Common Cold

The common cold is spread directly from person to person with no intermediate source (i.e., food, water). The only mechanism to prevent spreading the infection is to isolate the infected individual. However, the virus has usually been transmitted prior to the time the common cold is detected. The most frequent time for the common cold to occur is the winter, but early autumn and spring are also peak periods.

Young children from age one to five experience the most colds, while adults in the 25 to 30 year old range also experience a significant number of episodes annually. The young children are at greatest risk for complications, such as pneumonia or otitis media. Individuals over 60 years of age have fewer colds which may be attributed to an immunity developed to the variety of pathogens.

Poor nutritional state, fatigue, and emotional disturbances are associated with a greater susceptibility to infection. Factors such as wet feet or body chills may contribute to enhancing the effects of the invading organism, but do not cause the common cold.

Etiology of The Common Cold

The cause of the common cold is a virus. Unfortunately, more than 200 different viral strains that produce common cold symptoms in humans have been isolated. The rhinoviruses, adenoviruses, coxsackieviruses, echoviruses, influenza viruses, and parainfluenza viruses are known causative agents. The rhinoviruses account for as many as 40% of all common colds in adults, but simultaneous infection with more than one virus is not rare.

Bacteria and viruses are different with regard to their mechanisms for causing disease as well as their response to therapy. The virus penetrates the host cell by a variety of mechanisms which are not clearly understood. Then, the virus is attacked by the host cell which results in the release of viral nucleic acid. The virus uses the host cell pathways to manufacture components needed for replication and is then released by the host cell to repeat the

cycle against adjacent cells. After this process occurs many times, the body's inflammatory response mechanism is activated and the symptoms appear. Immunity after infection from viruses varies.

However, reinfection can usually occur, although for some periods of time the reoccurrence may be milder.

Major Clinical Features of The Common Cold

The inflammatory process which occurs in the respiratory tract after the viral invasion is the major cause of symptoms associated with the common cold. The major processes occurring in the area are hyperemia (excess blood flow), edema (abnormal fluid accumulation), and rhinorrhea (watery discharge from the nasal mucous membranes).

The severity of damage to the inflamed respiratory area is dependent on the type of infecting virus. For example, various strains of influenza virus are much more virulent and cause more damage than those that are responsible for the common cold.

The incubation period for most viruses associated with the common cold is relatively short (24 - 96 hours). Typically, viral shedding begins one to two days before the onset of symptoms. Peak viral replication and host injury occur during the next few days, which is associated with the major symptoms. At this point, body defenses intervene and symptoms begin to decrease.

The classic symptom associated with the common cold is rhinorrhea. Typically, it is initially clear, but this is followed by a much thicker, mucoid, and purulent secretion which is composed primarily of dead epithelial cells and white blood cells. This may or may not be associated with a secondary bacterial infection. In addition, some viruses may cause other inflammatory processes of their own which will contribute to the type and quality of secretions.

Nasal congestion and discharge are the most common complaints associated with the common cold. Nasal irritation, discharge, and congestion promote sneezing, which in some cases may be a relief from symptoms.

Another common complaint is pharyngitis, which is frequently described as a soreness or dryness of the throat. It is usually the result of the entire infectious process, but if the patient uses tobacco products or ingests alcohol containing beverages, this may be an important contributing factor.

Irritation of the pharynx may cause a nonproductive cough. This may also result from irritation of bronchial membranes by infectious material dripping from the nasopharynx. As the common cold progresses, the cough may become more productive.

Other symptoms include headache, warm sensations, and laryngitis. These symptoms vary in intensity from patient to patient.

Complications Associated with The Common Cold

Typically, the common cold is self-limiting and continues for a five to eight day period. There are a variety of complications that can occur. Although viral infections cause no significant alterations in the bacterial flora, the inflammation may be of sufficient magnitude to obstruct passages in the respiratory and/or nasopharynx area to provide a source from which a secondary bacterial infection can occur. Patients with other illnesses (i.e., children with asthma) are more susceptible to developing complications. The most common bacterial complications are purulent sinusitis, otitis media, bacterial pneumonia, and tonsillitis. These complications become apparent as the common cold becomes more severe with the development of fever and the failure of the common cold to improve.

Influenza, measles, allergies, and pharyngitis associated with bacterial infection may all mimic the common cold, but each has symptoms that should distinguish it from the common cold before complications occur. These complications usually will require other therapy, such as antimicrobials. However, the use of antimicrobials to treat the common cold is not warranted.

General Treatment

First and foremost, the pharmacy practitioner can tell patients that there are no specific curative remedies for the common cold. The drugs used are intended to produce palliation of symptoms while the body defenses remove the viruses and repair the damage. Adequate fluid intake and nutrition are also beneficial.

Decongestants can be used to treat nasal congestion and discharge. Reducing these symptoms not only relieves the discomfort but also prevents excessive nose blowing, which may further irritate mucous membranes and the nostrils.

Increasing oral fluid intake and/or humidifying inspired air are the initial methods used to control cough. If other treatment is required, then the characteristics of the cough can dictate whether a cough suppressant, demulcent, and/or expectorant is required. Dry or sore throat may be indicative of other pathological processes and usually requires the attention of a physician. Lozenges or sprays containing a local anesthetic can be used for temporary relief.

Acute laryngitis is a difficult problem to treat because lozenges and gargles do not relieve the hoarseness and cannot reach the inflamed laryngeal tissue. Water vapor inhalation several times daily has been used with moderate success.

Analgesics can be used to treat the aches and malaise that are associated with the common cold.

Another important component is prevention. Common cold viruses are spread through the air and by personal contact. Therefore, contact with individuals with colds is a frequent method of being infected. It is difficult to avoid people who have colds, but washing the hands frequently and avoiding touching or rubbing the eyes and/or nose are useful measures that may prevent a cold. In addition, wiping off items such as telephone receivers with antiseptic wipes will aid in removing potential contaminants. Adequate nutrition, and appropriate rest are beneficial for protecting against a common cold.

Vitamin C taken in doses of one gram or more may provide some prophylaxis, but the appropriate dose has not been established; therefore, the use of vitamin C remains unclear.

Antihistamines

Although histamine is a common biogenic amine found in every body tissue, it is most commonly located in the mast cells. It is stored in granules and becomes active when the cells are lysed, which occurs as a result of trauma and/or allergy. Histamine causes vasodilation, edema, and capillary permeability, which are most pronounced in higher vascular areas (i.e., nose). Histamine appears to be more of a major factor in allergic rhinitis than in the common cold.

The various viruses responsible for causing colds produce different responses to colds. Consequently, the role of histamine in cold symptoms will vary depending on the virus causing the cold.

Antihistamines exert their effects by competitively blocking the action of histamine. Therefore, their concentration at the receptor site must exceed that of histamine in order for its effects to predominate.

The antihistamines are chemically similar to anticholinergic drugs, local anesthetics and sympatholytic drugs. Consequently, some of their effects are related to these drugs and may or may not be beneficial.

The most commonly employed nonprescription antihistamines include brompheniramine and chlorpheniramine. In addition, diphenhydramine and doxylamine are used.

When used on a regular basis, antihistamines may not be as effective after several weeks or months. Some antihistamines cause liver enzyme induction, which can result in an increase in the metabolism of the antihistamine and, possibly, other drugs that have a similar route of metabolism. In some cases, a change to an antihistamine in a different chemical class may result in an improvement in effectiveness because these drugs vary in their ability to induce liver enzymes.

Antihistamines have no effects in aborting or preventing the common cold, but they can produce a drying effect as well as interact with histamine. These effects may be beneficial in some patients.

The primary contraindication to antihistamine use is sedation. The amount of drowsiness varies from patient to patient and drug to drug. In general, the alkylamines (i.e., brompheniramine, and chlorpheniramine) possess weak sedative properties, while the ethanolamines (i.e., diphenhydramine and doxylamine) have greater sedative effects.

In some children, CNS stimulation (i.e., insomnia, nervousness) rather than depression has occurred. In some patients, the anticholinergic properties of the antihistamine are the significant effect. Dry mouth, blurred vision, urinary retention, and constipation are the major complaints. These effects are most commonly encountered in older patients and/or with higher doses.

Loratidine, a nonsedating antihistamine, is available as a non-prescription product. Although there will not be any benefit over other antihistamines with regard to treating the common cold, many of the undesired effects (e.g., drowsiness) may be reduced or alleviated.

Topical Decongestants

A variety of sympathomimetic amines have been employed to provide relief from the nasal stuffiness of the common cold. These drugs are contained in numerous nonprescription products and differ mainly in their duration of action. These drugs reduce blood flow in the edematous nasal area by constricting the dilated vessels within the nasal mucosa.

Although there is no ideal topical decongestant, the majority of the nonprescription products available act promptly and effectively to decrease nasal congestion.

Patients using topical decongestants should adhere to the labeled directions regarding the duration and frequency of use. In some cases, topical application of these drugs results in a rebound phenomenon in which the nasal mucous membranes become even more congested and edematous as the vasoconstrictor effects of the medication decrease. This effect is minimal, if the topical nasal decongestant is used for only three or four days. However, the rebound phenomenon can result in a major problem because the patient will assume the rebound phenomenon is an increase in symptoms and use additional medication. The pharmacist must question the patient to ascertain the amount of time the patient has been using the topical decongestant.

Topical decongestants are available in drops or sprays. Most adults and older children indicate that the sprays are more convenient and probably provide better decongestion by reaching greater areas of the mucous membranes. Drops are usually preferred for children under age six because of their smaller nostril openings. The primary differences between the major topical decongestants are in intensity and duration of action.

An alternative to decreasing the resistance of air passing through nasal passages in patients with colds is the use of an adhesive strip device applied externally to the nostril. These strips physically lift the nostrils which keeps the nasal passages open.

Oral Decongestants

Although the oral decongestants are usually longer acting than the topical decongestants, they do not produce as intense vasoconstriction. These drugs affect other vascular beds as well as those of the nasal mucosa. Therefore, they should be used with caution in patients predisposed to hypertension, cardiac arrhythmias, glucose intolerance, and hyperthyroidism. Patients with disorders associated with these symptoms (i.e., diabetes mellitus) should use these products only on the advice of a physician. In addition, these sympathomimetic amines are contraindicated in patients receiving monoamine oxidase inhibitors.

The primary drugs used as oral decongestants are phenylephrine and pseudoephedrine. Phenylephrine is an effective oral decongestant, but it is rapidly hydrolyzed in the gastrointestinal tract. Therefore, the amount of drug delivered to the blood stream is hard to predict. Pseudoephedrine is an effective vasoconstrictor which causes little CNS stimulation, but has been implicated as a basic substance for use in manufacturing drugs for abuse.

Analgesics

The primary use of analgesics is to relieve the aches and pains associated with the common cold. Headache as well as musculoskeletal pain occur frequently and can be treated with acetaminophen, ibuprofen, or in adults, aspirin.

Fever is an atypical symptom with the common cold. Therefore, a more complex infection should be considered, if fever is present for more than a day.

Expectorants

The use of expectorants to treat common cold symptoms is controversial. Fluid intake and maintaining adequate humidity of inspired air are essential to respiratory tract fluid mucus production. This can be accomplished by drinking six to eight glasses per day of fluids and by using a cool mist or hot steam vaporizer. Although this method usually produces desired results, many individuals use and achieve satisfactory results with expectorants.

The expectorants used most frequently include ammonium chloride, terpin hydrate, and guaifenesin. Ammonium chloride is thought to increase the respiratory tract fluid by reflex stimulation of bronchial mucous glands. It can acidify the urine which may affect the elimination of other drugs, but is usually used in a dosage which will not result in a clinically significant problem. Ammonium chloride should be used with caution in patients with hepatic, renal or pulmonary insufficiency.

Terpin hydrate should only be used in patients over 12 years of age. It is relatively effective in some patients and acts by direct stimulation of lower respiratory tract secretory glands.

Guaifenesin is believed to act by reflex gastric stimulation, but seldom causes gastric upset. Its effectiveness varies from patient to patient.

Antitussives

The antitussives or cough suppressants are indicated when there is a need to reduce the frequency of cough, particularly the dry, nonproductive type of cough. These drugs, which include narcotics and nonnarcotics, act by suppression of the nerve receptors within the respiratory tract or by CNS depression of the cough center in the medulla.

Codeine, dextromethorphen, and diphenhydramine have all been recommended as safe and effective nonprescription products when taken appropriately. Codeine is the antitussive against which all others are compared. When used appropriately as an antitussive, codeine has a relatively low potential for abuse and provides effective cough control. Dextromethorphan is very similar to codeine with regard to potency, is effective, and produces few adverse effects. Diphenhydramine, a potent antihistamine, is an effective nonprescription antitussive when used in appropriate dosage. The adverse effects encountered include sedation and anticholinergic-type reactions.

Mast Cell Stabilizers

The mast cell stabilizers, such as cromolyn, are drugs that stabilize the mast cells which results in the prevention of the release of histamine and other chemical mediators that produce inflammation. These drugs are used in treating allergic rhinitis and asthma and may have some symptomatic benefit in treating the common cold, particular if used before symptoms fully develop.

Other Drugs

A variety of other drugs are used in the treatment of symptoms associated with the common cold. Oral antibacterials and anesthetic agents (i.e., benzocaine) are or have been contained in nonprescription common cold products. There is much controversy regarding the effectiveness of these products, particularly in combination. Anticholinergics were used in some products to treat symptoms associated with rhinorrhea. However, in most instances, dosages used were not adequate.

Role of The Pharmacist

As with any group of self-medication, the role of the pharmacist becomes more complex. Although these products are generally safe when used as directed, there is the potential for interaction with other drugs and/or diseases the patient has concurrent with the common cold.

In some instances, the pharmacist must be able to distinguish between the common cold and allergic rhinitis based on symptoms and patient history. Therefore, it is important that the pharmacist have a patient history as well as medication profiles on the patients to whom he recommends the use of these products.

Since there are so many preparations available, it is important that the pharmacist becomes familiar with these products as well as their efficacy and safety. The pharmacist will be able to select several products that are beneficial for recommendation. If only one symptom is being treated, then a preparation with a single agent should be recommended. If multiple symptoms are to be treated, then an appropriate combination product or several products should be used.

In all cases where the pharmacist is involved, it is essential that consultation with the patient is conducted in order that the patient understands the advice provided.

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Table 1

Examples of Non-Prescription Cold Treatment Products

Actifed
Afrin
Benzedrex
Cheracol
Claratin
Comtrex
Contac
DayQuil
Delsyn
Dimetapp
Formula 44
PediaCare
Robitussin
Sinutab
Sudafed
Tavist
Triaminic
Tylenol
Vicks

Comparison of Features of The Common Cold and Influenza

Symptom	Common Cold	Influenza
Fever	Unusual	Typical
Headache	Unusual	Typical
Aches & Pains	Very Mild	Prominent
Rhinnorhea	Typical	Unusual
Sore Throat	Typical	Unusual
Fatigue & Weakness	Very Mild	Prominent
Extreme Exhaustion	Very Rare	Early and Prominent