"Over-the-counter decongestants for infants with common cold" – *A pediatrician's dilemma!*

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The current COVID-19 pandemic has made our lives completely unpredictable and chaotic. Everyone is scrambling to find the what, why, and how of this viral infection, and as a pediatrician, I have received numerous calls regarding what needs to be done for this virus in particular and for not so dangerous seasonal viral fevers or what we call "common cold."

Common cold has been there since eternal time, and still, there is no way to eradicate it. An average person gets 2–3 episodes annually and for infants, the number is still higher. Although the number of episodes and severity tends to decrease with increasing age [1], one cannot deny that the symptoms are debilitating for adults and children alike and additionally take a tremendous toll on the economy [2].

The common cold is caused by a group of viral pathogens, namely, rhinoviruses, coronaviruses, influenza virus A and B and parainfluenza virus, and respiratory syncytial viruses (RSVs), responsible for seasonal flu outbreaks [2]. COVID-19 belongs to the coronavirus group of viruses. Rhinovirus accounts for 24–52% of clinical cases or 52–76% of infections with an identified pathogen [3-6]. No pathogen is identified in 31–57% of upper respiratory tract infections (URTIs) [5,6], likely due to a number of reasons, including poor collection technique, low pathogen count due to sampling late in the illness, or previously unidentified agents. Only about 5% of clinically diagnosed cases are found to have bacterial infection (with or without viral coinfection) [6].

These are found everywhere and can be contracted through touching the eyes, nose, or mouth after coming in contact with infected surfaces or through droplets in cough and sneezing [7]. The common cold is an acute, self-limiting viral infection of the URT involving the nose, sinuses, pharynx, and larynx. The incubation period varies, but is just under 2 days for rhinovirus [8]. The symptoms, which are generally correlated to the infected mucosa, peak at 1–3 days and last 7–10 days and may occasionally persist up to 3 weeks [1,2,7]. They include sore throat, rhinitis, rhinorrhea, cough, and malaise [7]. However, infants (<12 months) commonly seen symptoms are fever, irritability, blocked or runny nose, cough, and poor feeding. In addition, they may have diarrhea, vomiting, or feed intolerance.

The common cold is self-limiting and usually runs a course of 7–10 days [9] unless the child has developed complications like a secondary bacterial infection or is immunocompromised. It is a challenge for both parents and doctors alike to manage the symptoms of these outbreaks and protect the younger ones from the debilitating complications, which may be secondary bacterial coinfections [10] and recurrent infections, leading to transient wheeze and exacerbation to asthma. The symptoms of common cold overlap with other conditions in the URT such as allergic rhinitis, sinusitis, otitis media, and streptococcal pharyngitis. Fever, cough, and runny nose are the primary symptoms. Hence, diagnosis is purely made on clinical presentation of the child along with the severity of illness since onset.

Diagnostic tests such as nasopharyngeal throat swabs, reverse transcription-polymerase chain reaction (RT-PCR), and sepsis screening are required when there are complications such as breathing difficulty, high-grade fever, or wheezing. For the above complications, a different approach is followed, which is beyond the scope of this article. The majority of the episodes are self-limiting and warrant no laboratory-based investigations. The challenge for a pediatrician is to swiftly differentiate a viral disease from a bacterial illness and assess the progression to complications and simultaneously manage the symptoms in the child and the anxiety of the parents. However, whatever be the duration of illness, it has a substantial impact on the work and wages of the parents, use of health-care services, money spent on medicines, and other expenditures incurred due to the illness [9].

An average child will have 6–10 episodes of flu annually, and the symptoms last for 10–14 days [11]. This makes it even more frustrating for the parents to understand why despite treatment, the symptoms keep coming back. Many antivirals and antibiotics may be prescribed by the practitioners for such cases. They, however, have no role in mild seasonal viral fever, and their use is limited to children having severe symptoms such as wheezing, respiratory distress, or complicated by secondary bacterial infections [10,11]. Antibiotics do not have any beneficial effect on the common cold but do increase adverse events [12]. As a number of symptoms of bacterial URTI overlap with cold symptoms, clinicians may be tempted to prescribe antibiotics. Although prescribing should be minimized, issuing a delayed prescription for an antibiotic at times of uncertainty has been shown to reduce antibiotic use from 93% to 32% [13].

Home remedies such as steam inhalation, Vaporub, and eucalyptus oil may or may not have any benefits as the evidence

is insufficient to prove anything with certainty [14]. Studies of nasal irrigation [15], humidified air [16], and Chinese herbal medicines [17], all showed inconsistent results. The findings of the three randomized controlled trials in children suggested that a single night-time dose of honey can have a small effect on cough and sleep in children over 12 months old [18-20]. Honey should not be given to children younger than 12 months.

Many common over-the-counter (OTC) preparations such as cetirizine, promethazine, pseudoephedrine, phenylephrine, and chlorpheniramine and topical agents like xylometazoline are advised by most of the pediatricians/physicians. These are readily available without prescriptions and parents inadvertently buy these from past prescriptions or by past experiences with elder siblings or other children in their families. However, there is no substantial evidence that these are effective in alleviating symptoms or providing permanent relief [12]. On the contrary, they are ineffective and cause side effects such as drowsiness, irritability, gastritis, and chronic nasal congestion [11].

The decongestants result in small improvements in nasal symptoms, according to the three meta-analyses [21-23] and a systematic review [23], but their clinical significance is uncertain. Oral decongestants were shown to decrease subjective nasal symptoms by 6% with a single dose and 4% with recurrent doses, but clinical relevance is uncertain [23]. Hence, the irrational use of all OTC drugs used to manage common colds should be strongly discouraged.

Nonsteroidal anti-inflammatory drugs (NSAIDs) and acetaminophen appear to be effective in relieving pain and fever in adults with URTI but not in relieving other symptoms [24-26]. Ibuprofen has been shown to be superior to acetaminophen in fever control, whereas the safety of these drugs, at least in pediatric populations, is equivalent [26,27].

Without mentioning steroids, this milieu will not be complete; however, their use is only warranted in wheezing, but the current evidence does not support a clinically relevant effect of systemic or inhaled glucocorticoids on admissions or length of hospitalization for acute bronchiolitis. Combined dexamethasone and epinephrine may reduce outpatient admissions, but results are exploratory, and safety data are limited. Future research should further assess the efficacy, harms, and applicability of combined therapy [28].

Hence, the only treatment for the common cold as apparent from the current evidence is supportive comprising NSAIDs (ibuprofen) and acetaminophen (paracetamol) for fever and nasal saline irrigation for blocked nasal airways, much to the frustration of the parents. The prevention can help a long way to control the outbreaks and protect our children.

The first step for the prevention of common cold, including the deadly COVID-19, is by following hygienic handwashing practices frequently with soap. These practices not only prevent cold and seasonal flu but also bacterial infections and parasitic infestations alike. Additionally, the best and surest way to prevent infections is practice safe distancing from infected individuals. It is not only effective for COVID-19 but also for all infectious diseases. Other steps are to avoid touching the nose, eyes, and face and avoid going to the crowded places, etc. The role of vaccines in the prevention of common cold is controversial. Vaccines are not likely to be useful, as there are more than 100 antigenically distinct rhinoviruses, several coronaviruses, 47 adenoviruses, and so on.

One Cochrane review update found very limited evidence on the effects of vaccines for the common cold in healthy people [28]. Prescription of virus vaccines for preventing the common cold in healthy people can neither be supported nor rejected unless new evidence from larger, higher quality trials alters this conclusion. This Cochrane review does not provide evidence about other virus vaccines for preventing the common cold in healthy people [29]. Only vaccine available currently is for the prevention of seasonal flu caused by influenza virus types A, B, and C. For any other viruses, there is a limited evidence to support preventive attacks of the common cold.

However, it is pertinent to follow the influenza vaccination schedule followed in your country as studies have shown that it provides moderate protection directly and indirectly following the vaccination during the flu season as influenza, commonly referred to as flu, is a more severe form of the common cold.

In summary, there are little published data to support the use of OTC decongestants for URIs in children and none supporting the use of phenylephrine for children. Hence, the conclusion can be drawn that further research is the need of the hour to understand the epidemiology and pathogenesis of common cold in infants as existing evidence is inconsistent and of poor quality. For common colds, further work to help clinicians clearly distinguish the common cold from other URTIs would also be useful so treatment can be done accordingly. In addition, parents need to be counseled that there is no magic pill to alleviate the symptoms of common cold and patience is the key to manage this.

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