Introduction

There are approximately 2.500 first-time users of prescription pain medication daily, leading to 2.6 million new patients prescribed pain medications yearly. Recent data from 2010 suggests there are 2 million new abusers of prescription drugs, particularly hydrocodone, each year. According to the National Institute of Drug Abuse, 15% of high school seniors abused prescription drugs in 2013. Few reports exist of intranasal abuse of over-the-counter pharmacologic agents such as acetaminophen. Of particular interest, 24.6 billion doses of acetaminophen were sold in 2008. We hope to better characterize the presentation and manifestations of this behavior in order to facilitate earlier diagnosis and initiation of treatment.

Case Report

A 20-year-old female presented to the Otolaryngology clinic with nasal and throat pain, hoarseness, odynophagia, and headache for six months, with an associated 92-pound weight loss. Seven months prior to presentation, a friend advised her to crush acetaminophen tablets and inhale them intranasally to alleviate pain. She crushed and inhaled up to 3 to 4 acetaminophen tablets every half hour to hour for six months. Five months prior to presentation, she noticed difficulty breathing and intermittent epistaxis. Visits with her primary care physician, where abuse was not elicited, led to cultures and a month-long treatment with amoxicillin/clavulanic acid and fluconazole, recommended by an Infectious Disease physician. Our evaluation revealed an emaciated patient with a white film coating the mucosa of the nasal cavities and oropharynx, near-total septal perforation and destruction of the inferior and middle turbinates. There was erosion of the soft palate and obliteration of the uvula. A white film coated the hypopharynx, larynx, and subglottis. The patient admitted to her intranasal use of crushed acetaminophen at this time, and was admitted to the hospital for treatment.

Sinus, neck and chest computed tomography (CT) imaging showed nasal mucosal necrosis, partial erosion of the lateral nasal sidewalls, mild lymphadenopathy with poor visualization of the epiglottis, and bilateral ground glass airspace opacities concerning for multilobar pneumonia. On hospital day 4, Pulmonology performed a flexible bronchoscopy revealing an inflamed trachea with erythema and white particulate throughout the lungs, but no distinct endobronchial lesions. The following day, direct laryngoscopy, rigid nasal endoscopy, irrigation and debridement of the nasal cavity and pharynx with biopsies was performed by our team. During her hospital course, she failed oral intake trials and required gastrostomy tube feedings. She refused placement of a nasal trumpet and developed right-sided nasopharyngeal stenosis. The patient was seen at a 4 month follow-up, and had a near-total septal perforation, right-sided nasopharyngeal stenosis, and supraglottic stenosis due to aryepiglottic fold adhesions (Fig. 5). Swallow function was improved enough for normal oral intake.

Operative Findings and Pathology

Operative exam revealed thick plaques of white, powdery material coating the nasal cavity, pharynx, and larynx. There was erosion of the soft palate, as well as >75% of the nasal septum. The uvula was absent, the epiglottis was eroded and indistinct, and the left pyriform sinus was blunted (Figs. 1-3). Supraglottic laryngeal structures were edematous and indistinct with overlying mucoid secretions and eschar (Fig. 4).

Pathology revealed necrotic soft tissue diffusely involved with fungal elements. Aspergillus fumigatus and Candida kruusei were seen to involve the luminal space and walls of vascular structures within the necrotic soft tissue. Voriconazole treatment was initiated due to these findings, for a total of 9 weeks.

Discussion

Prior reports of intranasal drug abuse describe early use of oral antibiotics to treat a presumptive pharyngitis. This highlights a delay in diagnosis, often due to patients withholding information. Patients who inhale medications through one nostril exclusively typically have unilateral disease, helping rule out most infectious etiologies and guiding the clinician toward a correct diagnosis. One may visualize crushed pill debris in the nasal cavity, or analysis of intranasal debris can confirm the suspicion of drug abuse.

Septal perforations have been reported in 51-66% of patients with intranasal drug abuse containing acetaminophen. Interestingly, cocaine-associated septal perforation was much less common, with an incidence ranging between 4-11%. A pathologic diagnosis of invasive fungal sinusitis (IFS) was made in this case, however her clinical disease was considered to be distinctly different from IFS. In a retrospective chart review by Vosler et al., pathology and cultures revealed non-invasive fungal disease in 85.7% of patients abusing intranasal acetaminophen-hydrocodone. It is hypothesized that tissue necrosis facilitates superficial saprophytic fungal growth. Houlton et al. found that Candida albicans is the most common fungus found in intranasal drug-induced fungal rhinopharyngitis, followed by Aspergillus fumigatus and the bacterium Staphylococcus aureus.

Mucosal and structural necrosis may be due to osmotic properties of the medications and pills, adulterants in illicit drugs, or fillers used in the manufacture of the pills themselves. In the case of acetaminophen, a study by Hart et al. examined the localization of acetaminophen in a mouse tissue model. Toxic doses of acetaminophen can collect not only in the hepatocytes and renal cells, but olfactory epithelium. Talc, commonly a filler in drug tablets, is known to cause a granulomatous reaction in respiratory epithelium, both in inhaled and injected forms.

Conclusions

Without patient description of abusive behaviors, intranasal drug abuse diagnosis may be delayed or missed entirely. Patients presenting with nasal and nasopharyngeal abnormalities such as necrosis of the cronal mucosa or nasal septal perforation, particularly with unilateral findings, should raise suspicion of intranasal drug abuse.

Intranasal acetaminophen abuse can lead to significant destruction of nasal, pharyngeal, and supraglottic anatomy as well as contribute to lower airway disease as seen in this patient. While the direct etiology of the damage is debated, there is likely a combination of factors leading to mucosal injury. The easy accessibility of these drugs may lead to increased incidence of use with similar clinical findings to those found in patients abusing prescription and illicit drugs.

References

6. Lawton CA, Smith WS, Contreras JI, Wang EW, Lee S. Clinical and pathologic characteristics of intranasal abuse of combined opioid tablets, is known to cause a granulomatous reaction in respiratory epithelium, both in inhaled and injected forms.
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