Practice Guideline: Epistaxis in Children

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KEY WORDS
Epistaxis, children, assessment, treatment

Epistaxis is a common problem in the pediatric population, with the majority of cases being self-limited and managed with simple first aid measures (Siddiq & Grainger, 2015). The condition is defined as bleeding from the nostril, nasal cavity, or nasopharynx (Schechter & Stevens, 2009). Nosebleeds are classified as anterior or posterior bleeds contingent upon the origin of the bleed in the nasal cavity. Anterior bleeds constitute the majority of bleeds in children. Anterior bleeds are typically located in the anterior septum ("Little's" area) where vessels anastomose to form the Kiesselbach plexus. Posterior bleeds originating from the sphenopalatine artery are far less common in children, may bleed more profusely, and result in airway compromise, hemodynamic instability, and aspiration (Stoner & Dulaurier, 2013); these bleeds require evaluation by an otolaryngologist and often hospitalization (McClurg & Carrau, 2014). Although epistaxis in children is common and usually mild, it produces significant parental concern. Research by Davies, Batra, Mehanna, and Keogh (2014) using the Parental Stress Index Short Form found parental quality of life was significantly affected in 10% of recurrent epistaxis cases, with one of the primary concerns being fear of excessive blood loss.

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EPIDEMIOLOGY

Thirty percent of children younger than 5 years, 56% of children aged 6 to 10 years, and 64% of children aged 11 to 15 years of age have had at least one episode of epistaxis (Petruson, 1979). Epistaxis is unusual in the first 2 years of life, and the diagnosis of nonaccidental injury or serious illness should be considered when it is noted in this age range (Boscardini et al., 2013; McIntosh, Mok, & Margerison, 2007; Walton & Davies, 2010). The incidence of epistaxis diminishes after puberty and increases in adults after the age of 50 years (Haddad, 2011). Epistaxis occurs more commonly in the winter months and in association with allergic rhinitis (Purkey, Seeskin, & Chandra, 2014).

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ETIOLOGY

Etiologic factors of epistaxis can be classified as primary or secondary (Box 1). Primary epistaxis is defined as idiopathic bleeds without identifiable, precipitating factors, whereas bleeds known to be associated with a clear and definitive cause are classified as secondary epistaxis (Melia & McGarry, 2011). Trauma to the external and internal nasal

BOX 1. Etiology of epistaxis in children

Primary
Idiopathic
Secondary
Trauma
- Digital manipulation (nose picking)
- Facial trauma, blunt force
- Septal perforation

Inflammation and Infection
- Upper respiratory tract infections
- Allergic rhinitis
- Sinusitis
- Foreign body
- Vasculitis

Neoplasms and Masses
- Nasal polyps
- Rhabdomyosarcoma of the head and neck
- Juvenile nasopharyngeal angiofibroma

Hematologic Conditions and Coagulopathies
- Hemophilia
- von Willebrand disease
- Leukemia
- Platelet dysfunction/disorder
- Immune thrombocytopenia
- Aplastic anemia
- Liver disease

Medications
- Anticoagulants
- Nasal steroid sprays
- Illicit drug inhalation
- Natural medications

Vascular Anomalies
- Hemangiomas
- Hereditary hemorrhagic telangiectasia (Osler-Weber-Rendu syndrome)

tissues, such as facial trauma and septal perforation, may produce secondary epistaxis. Local digital manipulation resulting in mild trauma and hemorrhage to the anterior nasal septum is thought to be the most common cause of epistaxis (Gifford & Orlandi, 2008).

Inflammation and infection within the nares, nasal cavity, nasopharynx, and sinuses can result in secondary epistaxis. Dry air exposure may produce nasal vestibulitis, crusting, fissuring, and subsequent nose picking (Siddiq & Grainger, 2015). Upper respiratory infection, sinusitis, and allergic rhinitis produce inflammation and increased vascularity of the nasal mucosa, making friable tissue more vulnerable to the mechanical trauma of rubbing and picking. Although a microbiological cause has not been established, children with epistaxis are more likely to have nasal colonization of *Staphylococcus aureus* (Whymark et al., 2008).

Neoplasms and masses of the nose, head, or neck may present with secondary epistaxis. Juvenile nasopharyngeal angiofibroma (JNA) is a slow-growing, benign, highly vascular tumor presenting with nasal obstruction, unilateral recurrent epistaxis, headache, and facial deformity in male adolescents (Blount, Riley, & Woodworth, 2011). Other head and neck cancers in children include non-Hodgkin's lymphoma, rhabdomyosarcoma, and nasopharyngeal carcinoma (Zagolski, Dwivedi, Subramanian, & Kazi, 2010).

Hematologic conditions and coagulopathies, both congenital and acquired, are associated with epistaxis in children. von Willebrand disease is an inherited bleeding disorder caused by a deficiency or dysfunction of von Willebrand factor, a plasma protein that mediates the initial adhesion of platelets at sites of vascular injury and also binds and stabilizes blood clotting factor VIII in the circulation (Nichols et al., 2008). Immune thrombocytopenia (ITP) is an autoimmune disorder characterized by destruction of otherwise normal platelets, often without identifiable or specific precipitating factors (Neunert et al., 2011). Symptoms of thrombocytopenia due to ITP include epistaxis, menorrhagia, petechiae, ecchymoses, and rarely severe bleeding such as intracranial hemorrhage (Schultz, Mitra, Schapira, & Lambert, 2014). Other hematologic processes producing epistaxis in children include hemophilia, leukemia, platelet dysfunction, aplastic anemia, and secondary manifestations of liver disease.

Vascular anomalies such as hemangiomas in the nasosinus tract may give rise to epistaxis in children. Hereditary hemorrhagic telangiectasia (HHT; Osler-Weber-Rendu syndrome) is an autosomal-dominant blood vessel disorder characterized by arteriovenous malformations in the lungs, brain, liver, and spine, mucocutaneous telangiectases, and epistaxis (Sekarski & Spangenberg, 2011). Most patients with HHT will have nosebleeds of varying frequency and severity beginning at a median age of 12 years and the appearance of telangiectases of the mouth, face, or hands 5 to 30 years after the onset of nosebleeds (Faughnan et al., 2011).

Certain medications may produce or exacerbate nosebleeds. Anticoagulant medications such as warfarin and heparin alter the blood coagulation pathway. Epistaxis is a potential adverse effect of nasal steroid sprays. Nonsteroidal anti-inflammatory drugs and aspirin affect platelet function. "Natural" or alternative medications such as garlic, gingko, and ginseng are known to disturb platelet aggregation (Gifford & Orlandi, 2008). Nasal insufflation of recreational drugs such as cocaine and heroin may damage nasal mucosa with subsequent bleeding. Although the diagnostic causes for childhood epistaxis are extensive, more than 90% of cases have no underlying systemic cause (Qureishi & Burton, 2012).