

# A study of factors associated with epistaxis in children at a tertiary health care centre

Rajesh Ashok Karambelkar<sup>1</sup>, Manjushree S Kulkarni<sup>2\*</sup>

{<sup>1</sup>Professor, Department Of ENT} {<sup>2</sup>Associate Professor, Department of Paediatrics} Prakash Institute of Medical Sciences & Research Centre Urun Tal Walva Dist Sangli, Maharashtra, INDIA.

Email: [rajeshkarambelkar@yahoo.com](mailto:rajeshkarambelkar@yahoo.com), [manjushree1205@gmail.com](mailto:manjushree1205@gmail.com)

## Abstract

**Background:** Epistaxis is defined as acute haemorrhage from the nostril, nasal cavity or nasopharynx. Epistaxis does not seek medical attention, particularly if the bleeding is minor or self-limited. Epistaxis commonly occurs between 3 and 8 years of age and the incidence decreases in adulthood. Epistaxis in children is quite different from the adult and posterior epistaxis, anticoagulants, are blood pressure disorders are less seen in them. In the present study, we aimed to investigate the epistaxis among children (3–10 years age) at a tertiary care center. **Material and Methods:** Present study was a prospective, observational study conducted in Department of Ear, Nose and Throat in children (3-10 years) coming to outpatient clinic or emergency room of our casualty department with epistaxis, willing to participate in present study. **Results:** Total 126 epistaxis cases were considered in present study. 8-10 year age group was most commonly affected (52 %). Boys to girls ratio was 1.29:1. Higher incidence of epistaxis was noted in summer season (Feb to may) 71 % as compared to other seasons (29 %). Idiopathic factor was most common cause (60%). Trauma (25%), nasal foreign body (6%) and sinonasal infections (5%) were other causes noted in present study. Complications such as recurrent epistaxis (14%), shock (2%) and facial edema(2%) were noted. Mean hospital stay was  $2.1 \pm 2.2$  days. All patients had good recovery, no mortality noted. Digital pressure and observation was sufficient in 58% cases. **Conclusion:** Most common cause of epistaxis is idiopathic in nature, with the most common area is from the little's area in the anterior part of the nasal septum. Majority of nasal bleed stops with digital pressure, intervention like foreign body removal and nasal packing for diffuse bleed are necessary.

**Key Words:** Epistaxis, Emergency, Nasal packing, risk factors.

## \*Address for Correspondence:

Dr Manjushree S Kulkarni, Associate Professor, Department of Paediatrics, Prakash Institute of Medical Sciences and Research Centre Urun Tal Walva Dist Sangli, Maharashtra, INDIA.

Email: [manjushree1205@gmail.com](mailto:manjushree1205@gmail.com)

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## INTRODUCTION

Epistaxis is defined as acute haemorrhage from the nostril, nasal cavity or nasopharynx.<sup>1</sup> Epistaxis does not seek medical attention, particularly if the bleeding is minor or self-limited. It is a common condition among both children and young adults, whereas it is rare among neonates and

those less than 2 years of age.<sup>2</sup> Epistaxis commonly occurs between 3 and 8 years of age and the incidence decreases in adulthood.<sup>3</sup> According to epidemiological studies, among 30% of children in the age range of 0 to 5 years, 56% in the age range of 6 to 10 years and 64% in the range age of 11 to 15 have experienced the Epistaxis. 56% of adults have experienced the Epistaxis in their childhood.<sup>4</sup> There are several factors that cause nasal bleeding, either systemic or local factors, the former including blood disorders, uses of anticoagulants and coagulopathy, whereas the local factors include trauma, septal perforation, nasal allergies, infections in the upper airway, and the introduction of foreign bodies into the nasal cavity.<sup>5</sup> Epistaxis in children is quite different from the adult and posterior epistaxis, anticoagulants, are blood pressure disorders are less seen in them. Children have habit of nose picking and suffer from upper respiratory

tract infection frequently. Finger nail trauma, crust dislodgement by finger nails are common causes of repeated nasal bleeding in children. A fine understanding of the causes, treatment and outcome of these patients is important for establishment of preventive strategies as well as treatment measures. In the present study, we aimed to investigate the epistaxis among children (3–10 years age) at a tertiary care center.

## MATERIAL AND METHODS

Present study was a prospective, observational study conducted in Department of Ear, Nose and Throat, Department of Paediatrics, Prakash Institute of Medical Sciences & Research Centre. Study period was the period from January 2019 to December 2019 (1 year). Institutional ethical committee approval was taken for present study.

**Inclusion criteria** - Children (3-10 years) coming to outpatient clinic or emergency room of our casualty department with epistaxis, willing to participate in present study.

**Exclusion criteria** - Children with hypertension, liver or kidney failure, rheumatic heart disease, collagen vascular disease, malignancy, under medications contributing to bleeding tendency

The severity of epistaxis was graded using the Katsanis epistaxis scoring system, where epistaxis was considered mild with 0–6 score and severe with 7–10 score. A written informed consent was taken from their parents/guardians for participating in the study. A detailed history with emphasis on the age at onset, any recurrence, severity,

unilateral or bilateral, precipitating factors, other bleeding sites, family history, consanguinity, and treatment received was taken. A thorough clinical examination was done (blood pressure, pallor, ecchymosis, lymph nodes, hepatosplenomegaly, and hemarthrosis). In ENT examination, anterior rhinoscopy using nasal speculum was done to examine the anterior nasal cavity and nasal septum. Nasal endoscopy was done to examine the nose and nasopharynx for inflammatory signs, foreign bodies, polyps, telengectasia, or hemangioma. In cases with local causes such as polyps, hemangioma, mass, allergy, etc, some special investigations such as plain radiograph, computed tomography, MRI, nasal discharge culture, blood profile for eosinophils, IgE, and allergic skin tests were done. Blood investigations such as CBC (Hb, MCV), basic coagulation screen [bleeding and clotting time, prothrombin time, prothrombin concentration, activated partial thromboplastin time (APTT)] were done. In patients with abnormal coagulation results, other investigations such as platelet functions, clotting factors, and bone marrow aspirate or biopsy were done. All data was collected in excel sheet and analysed. Data were statistically described in terms of mean $\pm$ SD, median and range, or frequencies and percentages when appropriate. Comparison of numerical variables between the study groups was carried out using the Student *t*-test for independent samples. *P* values less than 0.05 was considered statistically significant. All statistical calculations were performed using computer program SPSS (statistical package for the social science) version 22 for Microsoft windows.

## RESULTS

After applying inclusion and exclusion criteria, total 126 epistaxis cases were considered in present study. 8-10 year age group was most commonly affected (52 %), as compared to 6-7 years (31%) and 3-5 years (17%) age group. We noted 56 % incidence in boys and 44% in girls. Boys to girls ratio was 1.29:1. Family history of epistaxis was noted in 34 % cases. Higher incidence of epistaxis was noted in summer season (Feb to may) 71 % as compared to other seasons (29 %).

**Table 1: Demographic factors**

Variables	No of cases (n = 126)	Percentage
Age (years)		
3-5	21	17%
6-7	39	31%
8-10	66	52%
Sex		
Boys	71	56%
Girls	55	44%
Family history		
Positive	43	34%
Negative	83	66%
Season		
Summer (Feb to may)	89	71%
Other than summer (June to Jan)	37	29%

On the basis of history and investigations, idiopathic factor was most common cause (60%). Trauma (25%), nasal foreign body (6%), sinonasal infections (5%), blood dyscrasia (2%), sinonasal tumours (1%), deviated nasal septum (1%) were other causes noted in present study.

**Table 2: Distribution by aetiological factor**

Aetiological factors	No of cases (n = 126)	Percentage
Idiopathic	76	60%
Trauma	32	25%
Nasal Foreign body	7	6%
Sinonasal infections	6	5%
Blood dyscrasia	3	2%
Sinonasal Tumours	1	1%
Deviated nasal septum	1	1%
<b>Total</b>	<b>126</b>	

The severity of epistaxis was graded using the Katsanis epistaxis scoring system, where epistaxis was considered mild with 0–6 score and severe with 7–10 score. We noted mild score in 77% patients and severe score in 23% patients. Other bleeding symptoms were seen in only 1 patient, later diagnosed as leukemia. 98% patients had anterior bleeding. Recurrent episode of epistaxis was noted in 14% patients. Complications were noted in 21 patients (17%). Recurrent epistaxis (14%) was most common, others were shock (2%) and facial edema (2%). Laboratory tests abnormalities such as hemoglobin (g/dl) less than 7 (12%), Platelet count less than 1 lakh (4%) and Abnormal APTT (activated partial thromboplastin time) (2%) were noted in present study. Mean hospital stay was  $2.1 \pm 2.2$  days. All patients had good recovery, no mortality noted.

**Table 3: Clinical characteristics in children with epistaxis.**

Gross features of epistaxis	No of cases (n = 126)	Percentage
Epistaxis score		
Mild	97	77%
Severe	29	23%
Other bleeding symptoms		
Positive	1	1%
Negative	125	99%
Area of bleeding		
Anterior bleeding	123	98%
Posterior bleeding	3	2%
Nature of epistaxis		
Acute (single episode)	108	86%
Recurrent	18	14%
Complications developed	21	17%
Shock	2	2%
Recurrent epistaxis	18	14%
Facial edema	2	2%
Laboratory tests abnormalities		
Hemoglobin (g/dl) less than 7	15	12%
Platelet count ( $\times 10^3/l$ ) less than 100	5	4%
Abnormal APTT (activated partial thromboplastin time)	2	2%
Outcome		
Mean $\pm$ SD Hospital stay (days)	$2.1 \pm 2.2$	
Good recovery	126	100%

Digital pressure and observation was sufficient in 58% cases. Other treatment modalities used were anterior Nasal packing (25%), 5% baby saline (0.225 NaCl) (12%), anterior and posterior nasal packing (3%) and chemical cauterization (2%). Blood transfusion was needed in 3% patients.

**Table 4: Treatment modalities**

Treatment Modality	No of cases (n = 126)	Percentage
Digital pressure and observation	73	58%
Anterior Nasal packing	31	25%
5% Baby saline (0.225 NaCl)	15	12%
Anterior and Posterior nasal packing	4	3%
Blood transfusion needed	4	3%
Cauterization	2	2%

## DISCUSSION

Epistaxis or nosebleed is a common complaint in ENT as well as general practice present as a emergency condition or may be a symptom of a generalized disorder. Epistaxis can be classified by its anatomical location into anterior and posterior epistaxis. Anterior epistaxis is more common than posterior epistaxis. More than 90% of episodes of epistaxis occur along the anterior nasal septum, which is supplied by Kiesselbach's plexus in a site known as the Little's area.<sup>6</sup> Majority of children having spontaneous haemorrhage is of venous origin from little's area where number of arteries anastomose forming Kiesselbach's plexus under thin mucosa, with bleeding resulting from region, exposed to dry air or minor trauma. The mean age group was  $6.4 \pm 2.6$  years. The most common age group was 8-10 years (52 %), followed by 6-7 years (31%) and 3-5 years (17%). Our findings are similar to other studies that most common age group of nasal bleed is between 6-10 years.<sup>7</sup> Boys to girls ratio was 1.29:1. Slight male predominance for epistaxis is documented in most series. Gilyoma *et al.* reported a similar male to female ratio of 2:1.<sup>13</sup> In present study idiopathic factor was most common cause (60%) followed by trauma (25%) , nasal foreign body (6%) and sinonasal infections (5%). In children, the most common cause is digital manipulation that leads to vascular fragility in the nasal vestibule. Crusts and scabs form causing itching, which in turn lead to trauma by digital picking. Other less common causes include allergic rhinitis, trauma, infections, anatomic variations, benign and malignant neoplasms, and bleeding disorders. Traumatic epistaxis is more common in younger individuals and is most often due to digital trauma, facial injury, or a foreign body in the nasal cavity. Non-traumatic epistaxis is rare in children and may due to systemic diseases and environmental factors (temperature, humidity, altitude).<sup>9,10</sup> 98 % patients in our study exhibited anterior nasal bleeding which corresponds well with findings of Viljoen *et al.*<sup>11</sup> who demonstrated that 90% of the epistaxis in children originates from Little's area in the anterior part of the nose, often being either idiopathic or the result of trauma. Epistaxis that occurs in children younger than 10 years usually is mild and originates in the anteriornose. Recurrent episode of epistaxis was noted in 14% patients. Past history of nasal bleeding was seen in 23.3% in study by Sampigethaya S.<sup>12</sup> *et al.*. Similar findings were noted by Al- Masum *et al.*<sup>13</sup> who reported that anterior bleeding was the area of bleeding in all children with epistaxis and 70% of them suffered from acute episodes; however, the recurrence rate was higher as it occurred in 30% of children with epistaxis. Treatment requires a methodical approach according to cause, site and severity of bleeding. Both conservative and surgical interventions may provide the right treatment option. The

goal of treatment are hemostasis, short hospital stay, low complication rate and cost effectiveness. In majority of cases of epistaxis only conservative treatment such as local pressure, vasoconstrictor drugs, anterior and posterior nasal packing are needed. Epistaxis refractory to conservative treatment can be treated surgically.

In present study digital pressure and observation was sufficient in 58% cases. Others required anterior Nasal packing (25%), 5% baby saline (0.225 NaCl) (12%), anterior and posterior nasal packing (3%) and chemical cauterization (2%). In a study conducted by Misra *et al.*<sup>3</sup> showed that the observation was the most commonly used management for children with age of 2 years and less than 5-year old, followed by anterior nasal packing. A study in Bangladesh noted complications such as, shock 4(8%) one of them required blood transfusion. Of the 50 patients 14(28%) had recurrent epistaxis and 3(6%) developed facial oedema.<sup>13</sup> In present study fewer complications such as recurrent epistaxis (14%), shock (2%) and facial edema(2%) were noted.

## CONCLUSION

Epistaxis is a common clinical condition among children. Most common cause is idiopathic in nature, with the most common area is from the little's area in the anterior part of the nasal septum. Majority of nasal bleed stops with digital pressure, intervention like foreign body removal and nasal packing for diffuse bleed are necessary. Nonsurgical treatment is safe, cost effective and usually sufficient.

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