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ORIGINAL ARTICLE

Children with Epistaxis and Risk Factors for Bleeding Disorders: Importance of Preoperative Diagnostic

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ABSTRACT

Objective: To determine the frequency of previously undetected bleeding problems in kids with severe epistaxis who required intraoperative nasal cautery after failing medicinal treatment.
Study design: Retrospective study
Setting: Khyber Teaching Hospital Peshawar .
Subjects and methods: Children (under the age of 19) with epistaxis who have been referred to an otolaryngologist must also have no known bleeding disorders, have had surgical nasal cautery, and have failed medicinal treatment. Information gathered includes epistaxis duration/severity, past bleeding patterns, and bleeding in the family. All patients had a screening CBC, PT, and PTT.
Results: 47 (19%) of the 248 participants who were referred for epistaxis matched the inclusion criteria (mean age 9.2 0.5 years;61.7 percent male). 31.9 percent (15/47) of the patients had abnormal coagulation findings, however only 2 patients continued to have them after repeat testing. 15 patients were sent to haematology, where 5 had bleeding disorders (3 had type 1 von Willebrand's disease, 1 had a condition of platelet aggregation, and 1 had minor factor VII insufficiency). 10.6% (5/47) of the group as a whole had a bleeding disorder. Previous trips to the emergency department for epistaxis were one of the clinically significant predictors of developing a bleeding disorder ($p = 0.04$). Younger patients who presented with epistaxis showed a tendency ($p = 0.07$).
Conclusion: Children who have repeated epistaxis while receiving medical treatment are more likely to develop a bleeding condition. 10.6% (5/47) of the patients in this highly selected cohort were found to have a bleeding condition. Only 20% (1/5) of individuals with a bleeding issue were identified by screening coagulation testing (PT, PTT). In most individuals, the diagnosis was not made until after a thorough haematology examination.
Keywords: epistaxis, bleeding disorders, children, diagnostic

INTRODUCTION

Up to 60% of paediatric children have epistaxis at some point in their lives. (1) Trauma (digital manipulation is often employed in paediatric treatment), drugs, allergic rhinitis, dehumidification, septal perforation, neoplasms, hereditary hemorrhagic telangiectasia (HHT), or an acquired or congenital bleeding disease may all cause epistaxis.. (2, 3) Pediatric epistaxis patients are often sent to otolaryngologists for examination, and the vast majority of instances are small, caused by local events, and respond to normal medical therapy. A bleeding condition may be more likely to develop in the smaller proportion of young children who continue to have epistaxis in spite of receiving proper medical treatment. Epistaxis is a common main complaint among children with mild bleeding problems. Children with moderate bleeding problems are less likely than adults to exhibit further bleeding symptoms due to the absence of severe hemostatic difficulties such previous surgery, dental work, or the start of menstruation. When treating patients with epistaxis, otolaryngologists are in a unique position to help with the identification of an underlying bleeding disease. Prior to surgery, knowing if a kid has a coagulopathy helps prevent cauterization issues and lower the risk of excessive bleeding following subsequent operations, childbirth, or trauma. There are currently few studies that outline the best procedure for preoperatively assessing kids with persistent epistaxis that needs surgical cauterization. (4-6) This retrospective study's goals are to ascertain (1)) the use of prothrombin time (PT) & activated partial thromboplastic time (PTT) tests for preoperative blood screening, and (2) the frequency of undiagnosed bleeding disorders in children with epistaxis who require surgical cauterization after medical treatment fails.

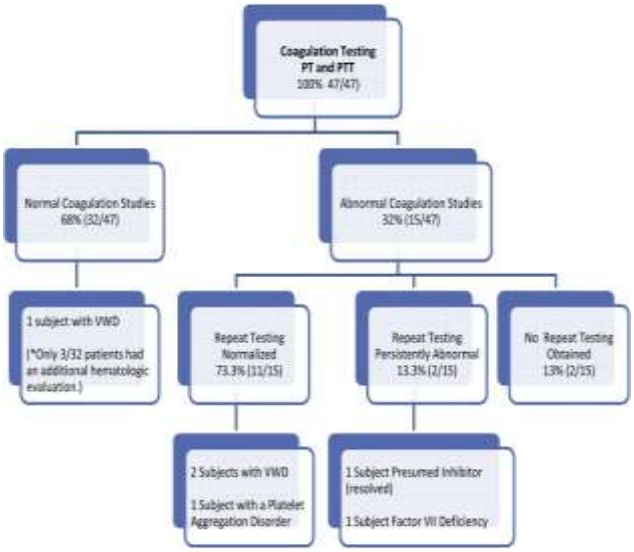
METHODOLOGY

This study was given the go-ahead for completion by the Institutional Review Board at Khyber Teaching Hospital ENT Department from Jan 2021 to Jan 2022. Participants in the study ranged in age from 0 to 18 years old and had to have a history of recurrent epistaxis, failed emollient treatment for epistaxis, and subsequent surgical cauterization of the septum. Patients who had received effective medical treatment, who were known to have a bleeding disease at the time of their initial examination, or who had a structural cause of bleeding such as tumours, HHT, or septal perforations were not included in the study because they did not meet the inclusion criteria. In accordance with the provider's established protocol, a complete blood count (CBC), a prothrombin time (PT), and an activated partial thromboplastin time (APTT) were performed on each patient prior to the surgical operation (PTT). In the event that these screening tests indicated abnormalities or if there were additional concerns, patients were sent to haematology for further evaluation. The subject's electronic medical record was combed through in order to get information on their demographic information, the severity of their epistaxis, any previous personal or family history of bleeding, and the findings of their preoperative coagulation tests..

RESULT

Total of 248 individuals were examined because they experienced recurring epistaxis. 191 of the individuals who were not included in the trial were effectively treated with a daily topical emollient treatment that sometimes included antibiotics. Due to a known pre-existing bleeding disorder, eight patients who required intraoperative intervention were excluded from the study. These patients had either an acquired coagulopathy (three from chemotherapy) or a congenital bleeding disorder (three type 3 von Willebrand (VWD), one idiopathic thrombocytopenia (ITP), and one platelet aggregation disorder). No individuals were discovered to have tumours such a juvenile angiofibroma, and two patients were eliminated because they had structural issues that needed to be fixed (septal perforation) (JNA). A total of 47 (19%) individuals needed surgical intervention and satisfied the research inclusion

criteria (electrocautery of the septal vessels). Males outnumbered females by 61.7 percent (29/47). 43.8% (20/47) of the individuals reported epistaxis lasting five minutes or more, with bleeding from both nares occurring in 63.8 % (30/47) of cases. 76.6 percent (36/47) of the individuals had frequent epistaxis (>25 episodes/year). Only two patients had previously had recurrent epistaxis-related iron deficiency anemia. 9.47% (19.1%) of those who reported having previously visited the ER for epistaxis. 17 percent (8/47) had previously received nasal cautery, and 6.4 percent (3/47) needed urgent nasal packing. Only one participant disclosed a previous history of bleeding. Although no patients reported having a family history of a particular bleeding disease, 10.2% (10/47) of patients did report having a family history of excessive bleeding in general. Every patient who was given the option of surgery afterwards had cauterization. Each subject had a screening CBC, PT, and aPTT. 8.5 percent (4/47) of the individuals with hemoglobin levels between 8.1 and 11.1 g/dL had anemia. Thrombocytopenia was absent in all patients. 31.9 percent (15/47) of patients with first coagulation screening reported abnormal PT, APTT, or both. Fig. 1 shows the results of a coagulation test in a flow diagram. Twelve individuals were referred to hematology out of the 15 participants with abnormal coagulation tests. Two patients with a minimally extended PT (0.2 s prolonged) of the three patients who were not sent to haematology underwent surgery without repeat coagulation tests or a haematology consultation. One of the patients received repeat coagulation investigations that normalized. Due to further worries about anemia or lack of family history as a result of adoption, three more individuals with normal coagulation testing were sent to haematology. Five of the 15 patients (or 33%) who were sent to haematology ultimately had coagulopathy.



Three children had type 1 VWD, one had platelet aggregation disorder, and one person had factor VII deficiency, which were the most frequent diagnoses. One patient had a transient inhibitor present, which was assumed to be responsible for an initially abnormal test result that later became normal. A preliminary study looked for clinical indications to assist detect coagulopathies. These included the patient's sex, age, duration of epistaxis, location of epistaxis, frequency of epistaxis, personal history of bleeding, family history of a bleeding disorder, family history of bleeding, anaemia from epistaxis, history of emergent nasal interventions, history of ER visits for epistaxis, and prior nasal cautery. Statistical analysis found a correlation between ER visits and diagnosable coagulopathy (p = 0.04). Younger children with coagulopathy tended to have an underlying coagulopathy (p = 0.07).

Table: Clinical indicators for bleeding disorder patients

	Bleeding disorders identified N	No bleeding disorder identified N (%)	P-value
Total participants	5	42	-
Subject history of other bleeding	0	1	1.00
Family history of bleeding	1	9	1.00
Age	6.4	9.5	0.07
Gender			
Male	3	26	1.00
female	2	16	
Epistaxis duration			
<5 min	2	9	0.63
5-10	0	7	
> 10	2	11	
Unknown	1	15	
Location			
Unknown	0	2	
Unilateral	2	13	
Bilateral	3	27	1.00
Epistaxis frequency			
5-14year	0	1	0.63
16-25year	0	2	
>25 year	4	32	
Unknown	1	7	
Emergent packing	0	3	1.00
Prior surgical nasal cautery	1	8	1.00
Prior emergency visit for epistaxis	3	6	0.04
Anemia	12.3	12.9	0.28

DISCUSSION

10.6% of the children in our sample at one institution who had recurrent epistaxis after receiving medical treatment had an underlying bleeding disorder. This is a significant percentage, although it is probably an underestimate since only 31.9% of the participants had a thorough hemostatic assessment.

Blood artery constriction, platelet adhesion at the injury site through von Willebrand factor (VWF), fibrin production via coagulation proteins on activated platelets, and fibrinolysis are all phases in attaining hemostasis at the site of injury. Any of these hemostasis participants may exhibit problems, which might lead to a secondary bleeding condition. Screening coagulation investigations (PT and PTT) do not reveal anything about vascular integrity, platelet function, VWF, or fibrinolysis; they only provide information about coagulation protein levels. Patients with severe or recurring epistaxis are more likely to have an undetected coagulopathy, according to a limited number of studies(4) . These individuals, who were sent to a haematologist or an otolaryngologist after their epistaxis did not improve with primary care therapy, tended to be high-risk patients similar to those in our research. Platelet aggregation disorders and von Willebrand Disease (VWD) were the two most frequent diagnoses. There have also been reports of moderate factor VIII deficit, Bernard-Soulier syndrome, factor VII, factor IX, and factor XI deficiency, among other bleeding diatheses. (7) According to Sandoval et al., among the patients who were referred to a hematology clinic for persistent epistaxis, 33 percent (n = 178) of them were found to have an unexplained bleeding problem. (5)

According to their results, 33 percent (5/15) of the 15 patients evaluated by hematology had a bleeding issue. Unlike those in our research, all of Sandoval's patients had at least one complete panel of diagnostic tests to rule out common bleeding diseases, such as CBC, PT, PTT, factor VIII activity, VW antigen, VW activity, VW multimer analysis, platelet aggregation studies, bleeding time, and factor assay. As a consequence, it is unclear whether individuals of our group with normal coagulation screens

would have been identified with coagulopathy if a comprehensive hemostatic examination had been performed.

Type 1 VWD is the most prevalent mild bleeding condition and is thought to affect 1% of the population overall (7) 20% (3/15) of the participants who had an examination for VWD were found to have type 1 VWD, which is much more than would be anticipated in the general population. Initial coagulation screening abnormalities were also highly prevalent (32 percent) in our population, although they did not last. This may be caused by improper specimen handling (underfilling the specimen tube or processing delays), a transitory inhibitor, like the one that affected our patient but subsequently disappeared, or a fluctuation in VWF and FVIII levels in VWD patients. A continuously extended PT in our investigation allowed us to identify the one patient who had a coagulation problem (minor factor VII deficiency). The first extended coagulation tests for the other participants led to a referral to haematology, which prompted a thorough hemostatic examination. Although the PT and PTT may provide valuable information, they do not fully describe the patient's hemostatic system to the doctor.

The value of preoperative coagulation screening tests is up for debate. In particular, it is unclear how beneficial a PT and aPTT are in identifying children having other surgical operations, including tonsillectomy, who could have an undiscovered bleeding condition (8) (9-11) Recognizing that the patient group with persistent epistaxis despite medical treatment differs significantly from a patient who requires a tonsillectomy but does not initially arrive with bleeding as a prominent symptom is crucial. In order to identify patients who could be at risk for postoperative bleeding, screening seems to be less effective. On the other hand, individuals with epistaxis who need surgery have severe bleeding symptoms and need a thorough hemostatic examination.

The only clinical risk factors we identified in our cohort—due to the limited sample size—were a history of prior ER visits and a tendency toward younger age at diagnosis. There were fewer clinical risk factors in our cohort that might be useful in identifying people who have a bleeding diathesis. Similar to previous research, "severe or recurring epistaxis" among kids who need cautery seems to be a separate risk factor in and of itself Although they were not shown to be predictive in our group, other historical risk factors mentioned in the literature, such as family history and personal history of bleeding, are undoubtedly significant.(3, 5)

This disparity may be related to the limitations of our investigation, which included the small cohort, retrospective analysis, and incomplete hemostatic testing for all patients. In conclusion, pediatric subspecialists in haematology and otolaryngology should be aware that children who come with chronic epistaxis after receiving the proper medical treatment may really have an underlying bleeding issue. According to our research, individuals who had previously visited the ER for epistaxis and were diagnosed at a younger age were also more likely to have a bleeding diathesis.

Others have claimed that a personal or family history of bleeding may also serve as a powerful clinical predictor. Patients who continue to experience epistaxis despite receiving medical treatment should receive a thorough evaluation that takes into account their medical history, including their medication history (since non-steroidal anti-inflammatory drugs (NSAIDs) have been linked to acquired bleeding disorders). If these are abnormal, hematology should be consulted for a thorough hemostatic examination. Clinicians may utilize the questions in Table 2 to find probable bleeding histories.

As most of our patients had prominent arteries, a physical inspection of the anterior septum was critical in diagnosing the origin of bleeding, along with a comprehensive medical history. Most patients (77%) responded to conservative treatment (emollient therapy that may have also included antibiotics; less commonly, they were additionally treated with room humidifiers or silver nitrate administered to the child's septal arteries in 2 instances). In a small number of cases, we identified septal perforation or deviation as a reason. In our study, we didn't identify patients with tumors (specifically a JNA), but a nasal endoscope may be helpful when bleeding is unilateral or occurs in adolescent males to identify a posterior mass or when symptoms of chronic sinusitis may be present to determine if bleeding is caused by polyps and/or pus in the osteomeatal complex. A record analysis of the patients in our study who got cautery demonstrated that the operation is effective as only 15% (7/46) of them needed repeat cautery when their epistaxis returned years later (mean 2.4 years, range 2.1–5 years).

CONCLUSION

For individuals who fail conservative care, surgery is successful. However, it is wise to be aware that people who visit a specialized clinic may be more likely to have an undiscovered bleeding issue. The identification of individuals with bleeding disorders has the potential to minimize bleeding during subsequent procedures and open up the possibility of using additional hemostatic medications to manage bleeding symptoms in the majority of these patients.

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