REVIEW

Dental Considerations of Hereditary Bleeding Disorders in Children: An Overview

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Abstract

Introduction: Hereditary bleeding disorders are the diverse group of disorders that happen due to the inherent abnormalities in the blood vasculature preventing the blood clotting process and leading to delayed bleeding.

Objectives: To review this heterogenous group of disorders and update the clinicians about their oral manifestations and dental management to prevent the onset of any complications in dental settings.

Materials and Methods: Review papers, original studies, case reports published in PubMed/MEDLINE, Web of Science, Scopus, Science Direct, and Google Scholar, as well as numerous publications, were used to compile the data by four reviewers.

Result and Conclusion: This review article explains the existing paradigm. Children with various hereditary bleeding disorders are a significant challenge for clinicians. Many authors have emphasized that patients with bleeding disorders can be managed safely in a dental setting if specific recommendations are followed.

Keywords: Children, Dental management, Hereditary bleeding disorders, Platelets.

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Introduction

Blood is a fluid connective tissue comprises of a liquid component called plasma and a cellular component that includes red blood cells, white blood cells, and platelets.[1] Diseases involving the blood and bone marrow are included under hemopoietic system disorders. It is generally defined as the study of circulating blood constituents, which encompasses illnesses of red blood cells, white blood cells, platelets, and bleeding disorders.[2] Hemorrhagic disorders can be congenital or acquired, and they can be triggered by vascular abnormalities, clotting factor deficits, or thrombocyte malfunction.[3]

Hereditary bleeding disorders (HBDs) are the group of unusual conditions characterised by an inherited tendency to bleed. Patients with these disorders represent a very small but important part of the population. The illness has been associated with mortality and morbidity, particularly in its more severe manifestations, as well as a variety of negative effects on general health.[4] The clinical manifestation of HBD varies depending on the underlying aetiology, which might disrupt clotting factors, platelets, or the arterial wall.[5]

Children who are experiencing bleeding symptoms can be difficult to diagnose. Some bleeding signs, such as recurring epistaxis or bruising, are common in healthy children, and distinguishing between healthy children and those with bleeding problems can be challenging. The degree of the bleeding varies with the severity of the illness. The recording of a patient's medical history is a significant aspect in determining a bleeding issue. Congenital bleeding disorders are frequently discovered in childhood, when a bleeding symptom or a family history is reported to the paediatrician. The family history may reveal vital clues about the possibility of an underlying bleeding condition being passed down through the generations.[6] A drug history should be collected, including prescription and over-the-counter medications, as well as herbal therapies, which could be the source of the hemostatic disease. This may provide a clue to the clinician in determining whether the condition is hereditary or acquired.[7]

Although the acquired bleeding disorders tend to be more commonly prevalent as compared to the hereditary ones, the focus of this review is to highlight the oral manifestations and dental considerations of the patients with the HBDs. Various diseases have been further listed under the hereditary and acquired bleeding disorders. But this review will gradually unfold the various HBDs with their prevalence, general signs and symptoms, oral manifestations, investigations and dental considerations.

Prevalence of Hereditary Bleeding Disorders:

The most prevalent hereditary bleeding disorders are

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coagulation factor abnormalities, which have different prevalence rates among ethnic groups. The overall incidence of congenital coagulation abnormalities in the general population, however, is low, around 10–20 per 100,000 people. 95–97% of all coagulation abnormalities are caused by haemophilia A, haemophilia B, or Von Willebrand disease. The most prevalent inherited coagulopathy is haemophilia A.[8]

Researchers from the Centers for Disease Control and Prevention (CDC) and the United States HTC Network studied all male patients from 2012 to 2018. Males with haemophilia are estimated to number between 30,000 and 33,000 in the United States. Hemophilia A has a prevalence of 12 cases per 100,000 U.S. males, whereas haemophilia B has a frequency of 3.7 cases per 100,000 U.S. males. It varies considerably across the country, with the highest populations in the Midwest and Northeast. Hemophilia A affects one out of every 5,617 male births in the United States, while haemophilia B affects one out of every 19,283 male births. When compared to the population's race and ethnicity distribution, those with haemophilia are more likely to be white, Hispanic ethnicity is equally prevalent, and black race and Asian origin are less common.[9]

Factor I (fibrinogen), factor II (prothrombin), factor VII (proconvertin), factor X (Stuart-Prower), and factor XI (plasma thromboplastin antecedent) are all uncommon coagulation factor deficits. Anticoagulation therapy is currently administered to over one million patients in the United States each year. In addition, 200,000 people suffer from chronic renal insufficiency, which impairs clotting.[8]

Von Willebrand disease (VWD) is another inherited bleeding illness characterized by a deficiency or malfunction of the Von Willebrand Factor, which affects 0.8–2% of the general population in Europe and America. However, because von Willebrand disease is frequently undetected, statistical prevalence does not reflect the disease's true prevalence.[10]

The prevalence of VWD has been estimated in several countries based on the number of symptomatic patients treated at hemostasis centres, and it ranges between 23 and 110 per million population (0.0023–0.01%).[11] Screening populations for bleeding symptoms has also been used to estimate it, with estimates of 0.6 percent, 0.8 percent, and 1.3 percent reported. Few studies that screened individuals using formal defined criteria to estimate the prevalence of VWD found a prevalence of around 1%, with no racial differences.[12]

Platelet disorders are another group of bleeding diseases in which bleeding can originate from thrombocytopenia, with a reported prevalence of 1.9 to 6.4 per 10 children/year.[13,14]

There are a number of other hereditary platelet diseases whose incidence is unclear. Platelet abnormalities caused by problems in platelet adhesion, aggregation, granules, and signal transduction are known as inherited thrombocytopathies. Even with adequate laboratory testing, diagnosing the more common mild forms of hereditary thrombocytopathies is difficult.[15] Only 40–60 percent of minor platelet abnormalities can be detected at the level of the faulty platelet pathway, according to predictions.[10,16]

Normal Haemostasis

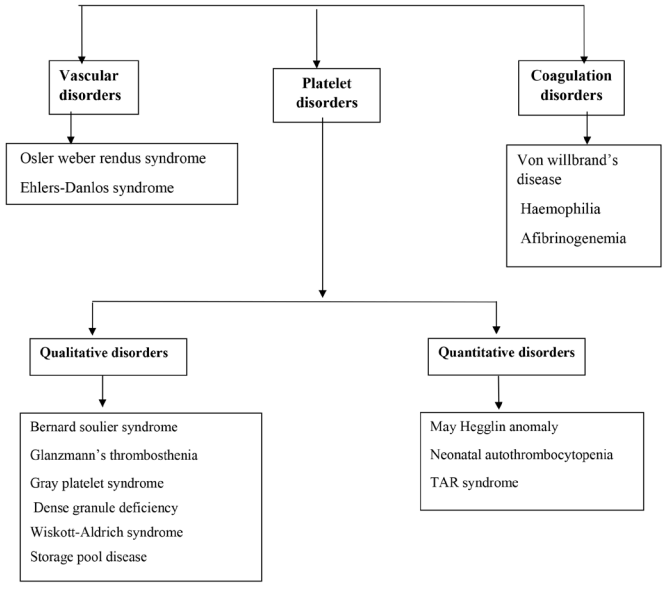
Hemostasis is a clinical term that refers to the prevention of blood loss. Hemostasis is a three-phase process that results in the formation of a blood clot at the site of vessel injury: primary hemostasis due to vascular constriction or platelet plug formation, secondary hemostasis or blood clot development as a result of blood coagulation and fibrinolysis. Primary hemostasis is an early phenomenon that occurs after the artery wall is damaged and vasoconstriction occurs as a result of local constriction of vascular smooth muscle cells. Changes in membrane phospholipids and calcium control three steps: platelet adhesion, platelet granule release, and platelet aggregation.[17,18]

Secondary hemostasis results in the wound being permanently closed mechanically, with local fibrin production and the formation of a fibrin-based clot based on coagulation factors, followed by healing and scar formation. These two processes occur at the same time and are interconnected. In addition to hemostasis, the fibrinolysis pathway is important.

Clotting is achieved in three steps: (1) A complicated cascade of chemical events involving more than a dozen blood coagulation factors develops in the blood in response to a vessel rupture or damage to the blood itself. The result is the production of a prothrombin activator complex, which is a collection of activated components. (2) The conversion of prothrombin to thrombin is catalysed by the prothrombin activator. (3) The enzyme thrombin converts fibrinogen into fibrin fibres, which entangle platelets, blood cells, and plasma to form the clot. Fibrin threads also adhere to damaged blood vessel surfaces, allowing the blood clot to attach to any vascular opening and therefore prevent further blood loss.[7,19,20]

Classification of hereditary bleeding disorders [21,22,28]

Hereditary Bleeding Disorders are classified in two broad categories.



Hereditary vascular bleeding disorders:

The most common cause of hereditary vascular bleeding disorders is connective tissue vascular malformation. They are characterised by blood vessel developmental defects and are associated with syndromes. Classic examples of bleeding diathesis are Osler–Weber–Rendu syndrome and Ehlers–Danlos syndrome.[8]

Osler Weber Rendu Syndrome

Hereditary hemorrhagic telangiectasia is another name for

Osler-Weber-Rendu syndrome. The name "Hereditary hemorrhagic telangiectasia" (HHT) was coined by Weber and Hanes. It is a fibrovascular tissue genetic disease. In 1896, Rendu was the first to describe it as a disease of the skin and mucosa.[23]

General Signs and Symptoms

It is a rare autosomal dominant pathology that leads to mucocutaneous telangiectasis and diffused distribution of arteriovenous malformations in the skin, mucosal surfaces, and solid organs.[24] These patients can develop iron deficiency anemia leading to epistaxis and gastrointestinal bleeding. Most of the patients remain asymptomatic and becomes apparent in the 4th decade of life. The incidence of occurrence of HHT is 1 in 5000 to 1 in 8000 people, across the globe.[25]

Curacao criteria (1999) has been established for clinical diagnosis of HHT: any of the three or more criteria confirms the diagnosis of HHT.24

- Epistaxis,
- Telangiectasia (oral cavity, nose, lips, and hands),
- visceral lesions and
- positive family history

The most common manifestations of HHT are: epistaxis (90–95%), facial telangiectases (33%) and hand telangiectases (41%). About 15–33% of patients with HHT have pulmonary AVM (located in the lower lobes) but the incidence varies according to the gene involved. Gastrointestinal bleeding from AVMs occurs in about 8–12% of patients. AVM can develop in any system, including spinal, coronary and renal.[24-26]

Dental considerations:

If a diagnosed case of OWRS visits the dental clinic for any dental procedures, these patients should be advised to undergo screening through CT, MRI and ultrasound to rule out any other systemic involvement to avoid any dental complications. Dentists must be aware about the complications associated like hypoxia, pulmonary or cerebral embolism interfering with the dental procedures. Dental chairs need to be kept upright while performing the procedures and oxygen should be available in the clinics.[27]

For the invasive dental procedures, antibiotic prophylaxis needs to consider for these patients to prevent any infections and cerebral abscess. Studies have found the same anaerobic organisms' aspirates in the cerebral abscess resembling those in periodontal infections.[28-29]

ORWS patients with anemia should avoid undergoing invasive dental procedures that can exacerbate anemia.[30] Local hemostatic measures needs to be implemented for the procedures requiring manipulation of the soft tissues.[31-32]

Ehler Danlos Syndrome:

The Ehlers-Danlos syndrome is a fibrillar collagen metabolism condition. Lysyl hydroxylase and procollagen peptidase enzymes are two key enzymes that are impaired in Ehlers-Danlos syndrome.[33]

Various types of the EDS have been described in the recent classification in 2017, but the 5 subtypes are the most significant ones (Classical EDS, Classical-like EDS, Cardiac-valvular, Vascular, and Hypermobile).[34] Classical and Hypermobile are the most common ones followed by the Vascular EDS (vEDS) representing only 5–10% of EDS cases.[35]

General Signs and Symptoms

The bleeding symptoms in EDS patients vary from mild bruising, hematoma formation to fatal bleeding episodes. These patients can also develop arterial aneurysms and intracranial hemorrhages as the complications of EDS. In a large cohort study, authors have found that EDS patients have no coagulation deficiencies but 80% have developed platelet malfunction leading to increased risk of bleeding.[36] The tissue fragility, joint hypermobility, skin hyperextensibility, and acrogenic faces are the most common diagnostic manifestations of the EDS. The classical facies have downward slanting palpebral fissures, blue sclera, micrognathia, and epicanthal folds in EDS patients.[37] Neurological manifestations include hypotonia, manifesting as delayed motor milestone in a growing child. These patients can develop cardiovascular manifestations like mitral valve prolapse.[34,37]

Oral Manifestations:

Hypermobility of the TMJ can lead to the frequent dislocation of the joint. These patients (approximately 50%) can touch the tip of the nose with tongue easily (Gorlin's sign) and thinning of the oral mucosa can increase the risk of oral ulcerations, and gingivitis progressing to periodontitis. The fragile gingiva can be observed during the routine oral prophylactic procedures leading to bleeding. Varied dental anomalies like enamel hypoplasia especially in premolars and molars, decalcification of enamel, shortened roots, and pulp stones are found to reported in the cases of EDS. Multiple OKCs have also been described in EDS patients.[38,39]

Dental Considerations:

It is crucial to perform the blood tests for coagulation factors and platelet levels before proceeding with any dental procedure. Patients' physician needs to consult for any systemic conditions that can lead to complications during dental treatment. The prevention of dental decay and gingival problems is crucial for these patients. The principles of sustaining good oral health are centred upon dietary restriction of sugars and maintaining a good oral hygiene regime.[38,39]

The prophylactic antibiotics are indicated in patients with mitral valve prolapse to prevent the risk of endocarditis. Shorter duration of dental visits is preferred to avoid causing the TMJ problems like dislocation. Alveolar nerve blocks should be given with great caution to avoid causing hematoma formation. Lighter forces should be used during orthodontic treatment due to the fragile periodontal tissues and considering that teeth tend to move faster. Some patients with EDS may develop mouth ulcers due to the trauma of any orthodontic appliance. This can be lessened by use of protective wax over the brace and possibly an occlusive paste placed over any sites of ulceration.[39,40]

Invasive maxillofacial surgical procedures should be avoided because of delayed wound healing and increased bleeding tendencies. However, sutures should be covered with acrylic dressings to hold them in place.[40]

Hereditary platelet disorders:

Platelets cling to the exposed subendothelium of a blood artery and secrete their granule contents when the channel is wounded. Platelet abnormalities, whether congenital or acquired, are linked to a higher risk of bleeding, demonstrating the importance of platelets in hemostasis.[41]

Hereditary platelet disorders are a rare set of diseases that are divided into two categories: *qualitative* and *quantitative* platelet defects.

Qualitative platelet Disorders

Bernard Soulier Syndrome

It is a rare hereditary bleeding disorder characterised by

increased bleeding time, thrombocytopenia and abnormally enlarged platelets.

General Signs and Symptoms

These patients develop symptoms since the day they are born and experience numerous episodes of bleeding, post-traumatic haemorrhages, epistaxis, cutaneous bleeding or ecchymosis.[42] The other manifestations may vary from purpuric spots to intracranial haemorrhage, gastrointestinal bleeding, heavy menstrual cycle in females, and hematuria. Severe bleeding complications have been reported in around 16% of the cases.[43] The adults with BSS have minor signs and symptoms of the disease with less severe bleeding episodes due to platelet reserve.[44,45]

Glanzmann thrombasthenia

It is a rare autosomal recessive bleeding disorder characterised by faulty or absent aggregation of the platelets leading to prolonged bleeding time in the patients with the normal size and number of the platelets.[46]

General Signs and Symptoms:

The manifestations of GT usually begin in childhood and gradually decrease with age as seen in the cases of BSS. Epistaxis is the most common occurrence in children with GT. Bleeding complications are more severe in females during menstruation cycle and childbirth. The clinical signs and symptoms are almost like the patients affected by BSS. Differentiation can only be made by the advanced laboratory investigations.[47,48]

Platelet-type von Willebrand's disease

Platelet-type von Willebrand's disease is an inherited dominant bleeding disorder resulting in spontaneous binding of plasma von Willebrand factor to the platelets. It results in accelerated clearance of the high molecular forms of VWF.

General Signs and Symptoms

Borderline thrombocytopenia, and a prolonged bleeding time associated with mild mucocutaneous bleeding and hemorrhage following tooth extraction, tonsillectomy, or other surgical operations are the common manifestations.[49]

Gray platelet syndrome (GPS)

It is a rare inherited bleeding disorder characterized by platelets that have a gray appearance, severe thrombocytopenia, myelofibrosis, and splenomegaly.

General Signs and Symptoms

These patients are susceptible to easy bruising, epistaxis, abnormal menstrual flow, like other hereditary bleeding disorders. Electron microscopy demonstrating the marked reduction in the alpha granules and high serum vitamin 12 levels are diagnostic for GPS.[50]

Wiskott–Aldrich syndrome (WAS)

The characteristic combination of severe immunodeficiency, microthrombocytopenia, and eczema describes WAS, an X-linked primary immunodeficiency condition.[51]

General Signs and Symptoms

WAS clinically manifest in males with females as asymptomatic carriers of the disease. The patients develop skin lesions like eczema with prominent signs of ecchymosis and purpuric spots on the body and are more prone to the recurrent infections. There is always a history of easy muco-cutaneous bleeding episodes or even intracranial heamorrhage. The most common first clinical manifestation in the patients with severe WAS is severe refractory thrombocytopenia with a platelet count less than 10,000/µL.[52,53]

Oral Manifestations of Hereditary Platelet Disorders:

The patients have compromised oral hygiene status, maybe because of fear of increased bleeding during brushing. They are more prone to develop dental decay and inflammatory periodontal diseases. These patients can develop intraoral purpuric spots, gingival bleeding during routing oral prophylaxis and even experience prolonged bleeding after the invasive dental procedures. These disorders may be present alone or in conjunction with gingival hyperplasia in cases of leukemia. Hemosiderin and other blood degradation products can cause brown deposits on the surface of teeth due to chronic bleeding.[45, 54, 55]

Owing to the poor oral hygiene in these patients, frequent episodes of the gingival bleeding is a constant finding of GT. Instant profuse bleeding can occur following the exfoliation of deciduous teeth, or minor invasive dental procedures.[48] Patients with Glanzmann's disease have lifelong mucosal bleeding and may require platelet transfusions for severe bleeding episodes.[46,48]

Dental considerations:

The management of patients with bleeding disorders depends on the severity of the disease and type of dental procedures planned. In the patients with severe bleeding disorders, the challenge to maintain the hemostatic system and to control the bleeding by local and adjunctive methods.[56] Evidence of petechiae, ecchymoses, hematomas or excessive gingival bleeding should direct the practitioner's attention toward a possible underlying bleeding disorder. When a bleeding disorder is suspected, laboratory investigations, including blood counts and clotting studies, should be carried out.

The drugs used for the bleeding disorders usually does not pose a risk for the dental procedures. But in case, those dugs need to be withdrawn, it should be done 10 days before the procedure and with the consent of the physician.[55]

Patient with HBDs usually requires platelet concentrate supplement prior to dental invasive procedures and tranexamic acid to control bleeding post-operatively. NSAIDs are contraindicated in these patients to avoid the risk of the bleeding. Nerve blocks are not recommended in the patients with bleeding disorders and should be replaced with local infiltration or intra-ligamentary blocks to avoid hematoma formation.[56] Alternative techniques, including sedation with diazepam or nitrous oxide-oxygen analgesia, can be employed to reduce or eliminate the need for anesthesia.[56] Patients undergoing invasive procedures requiring factor replacement may be treated under general anesthesia in a hospital operating room. Rubber dams need to be used to avoid any laceration of the soft tissues. High speed suction and saliva ejectors need to be used cautiously in these patients.[54] Gelfoam soaked in Tranexamic acid can help in controlling the bleeding after extractions. In order to maintain the gingival health, patients need to be advised on maintaining the good oral hygiene measures to prevent any further dental problems.[57]

Periodontal procedures can increase the risk of mobility of teeth and bleeding gums in the patients with HBDs. Ultrasonic scaling and polishing don't cause any complications in the patients. In patients with severely inflamed gums, preprocedural chlorhexidine mouth rinse and local debridement is indicated. Antifibrinolytic agents should be incorporated in the periodontal surgical packs to control the local bleeding.[58,59]

Quantitative platelet disorders

May- Hegglin Anomaly (MHA)

MHA is known as the "classic" form of heavy platelet syndrome. May originally described the illness in a young asymptomatic female in 1909, and Hegglin reported it in a man and his two children in 1945. MHA is linked to a mutation in the MYH9 gene, which codes for the nonmuscle myosin heavy chain IIA protein.[60]

General signs & symptoms

May–Hegglin anomaly (MHA) is a genetic condition characterised by thrombocytopenia of variable degrees, purpura and bleeding, gigantic platelets, and big, well-defined basophilic cytoplasmic inclusion bodies (similar to Dohle bodies) in granulocytes. Thrombocytopenia affects around half of MHA patients, though serious bleeding is uncommon. With surgical procedures, people may develop easy bruising, recurring epistaxis, gingival bleeding, menorrhagia, and excessive bleeding.[60,61]

Dental Considerations:

Medications that reduce platelet function, such as aspirin, should be avoided, just as they should be avoided for other bleeding disorders. Gingival bleeding can be reduced with regular dental care, and epistaxis can be reduced with the use of an oily nose ointment. Desmopressin (DDAVP) is the standard treatment. Desmopressin 0.3 mg/kg body weight before and after surgery, and tranexamic acid 0.5 g orally 3 times daily for 5 days following surgery as a local application by mouth rinse after dental extraction.[62]

Hereditary Coagulation disorders:

Hemophilia

The hemophilias are clinically relevant rare diseases: hemophilia A (HA), which results from the deficiency or dysfunction of coagulation factor VIII (FVIII), and hemophilia B (HB) of factor IX (FIX). Both are due to mutations in genes located on chromosome X and thus largely affect males, with bleeding symptoms roughly proportional to the degree of factor deficiency in plasma.[63]

General Signs and Symptoms:

The clinical manifestations of Hemophilia A and B are relatively similar, but conflicting reports have been reviewed in the literature and suggested that the Hem B patients have less bleeding tendencies as compared to Hem A patients.[64] In another study conducted by N Clausen et al in 2014 have found the similar manifestations in both the types of Hemophilia.[65] The signs and symptoms of the hemophilia directly correlates with the coagulation factors activity levels. In cases of mild disease (factor activity levels: 5-40%) does not have any significant bleeding risks except invasive surgical procedures. The moderate form of disease (factor activity levels around 1-5%) experience bleeding episodes in cases of trauma, mild surgical interventions and dental procedures.[66] Non-traumatic intra-articular and organ bleeding is one of the common manifestation of the severe form of Hemophilia (factor activity levels less than1%). The infants can develop unexplained bruises while crawling or after intramuscular injections. The risk of this intra-articular bleeding increases as the age progresses. Intracranial and extracranial haemorrhages are one of the most serious complications of the severe form of Hemophilia, commonly associated with the traumatic birth injuries.[65] The patients with severe disease can present with hemarthrosis and muscle bleeding.[67]

Oral Manifestations:

In the oral cavity, hemophillia can present in the form of petechie, ecchymosis and hematomas, especially on the floor of the mouth, tongue, labial frenum and palate. These patients can experience pronounced gingival bleeding during the routine brushing, eruption/exfoliation of teeth or the oral prophylaxis procedures.[68] These patients are prone to gingival recession, progressive periodontal diseases, alveolar bone loss, and tooth decay due to the lack of oral health care.[69]

Dental Considerations:

A comprehensive dental treatment planning is needed for the patients with Hemophilia. Prior to the day of dental treatment, patient's hematologist needs to be consulted. A deep insight in the patient's dental history is required in terms of previous episodes of dental bleedings and the maintenance of the oral health care. Depending upon the type of the dental procedure, the normal coagulation factor levels should be evaluated. The children need to be psychological prepared for the dental procedures to reduce their anxiety and stress levels. Patients need to be guided to maintain the proper oral hygiene. Hemostatic agents must be available in the dental operatory while performing dental procedures on such patients.[56,70]

Antibiotic coverage is given to treat the acute bacterial infection. Drainage of the abscess can put the patient at high risk of bleeding episodes, and if necessary, should be done under hematologist supervision. During the MOS procedures, minimum trauma should be induced to the soft tissues and proper suturing with surgical stent is required to hold the clot and promote the healing. Tranexamic acid and Epsilon aminocaproic acid (EACA) can be prescribed before the surgery and should be continued for a total of 7 days.[71] The local hemostatic agents, pressure surgical packs, vasoconstrictors, sutures, topical thrombin, fibrin, sealant (glue), collagen gel, oxidized cellulose (Surgicel), calcium alginate and ice therapy should be there in the dental clinics. Paracetamol is considered as the safest analgesic that can be used in such patients. NSAIDs should be prescribed with hematologist consultation, although aspirin is strictly contraindicated in these patients. There are no absolute contraindications for the anesthetic administration. Inferior alveolar nerve block is used only after raising clotting factor levels with suitable replacement treatment as there is a danger of bleeding into the muscles and probable airway impairment owing to a hematoma in the retromolar or pterygoid region. It may also increase the chance of mortality due to obstruction of airways. In many cases, intraligamental or interosseous injections are used as adjuncts to these nerve blocks to ovoid such complications.[70-72]

The cautious use of rubber dams, wedges, or matrix bands are advised under topical anaesthetic agents to avoid the risk of bleeding episodes. The most important goal in the hemophilic patients is to maintain the oral hygiene to prevent the dental decay, so these patients should be instructed to undergo regular dental checks, fluoride applications and avoid consuming sugary foods.[72]

Von Willebrand Disease

General Signs and Symptoms

It is an inherited bleeding disorder, characterised by the deficiency of plasma vWF affecting 0.1-1% of the global population.[73] Mild cases of vWD is usually asymptomatic, and is routinely diagnosed during the blood investigations in case of positive family history.[74] This disease equally affects both the genders and

manifest as bruising of the skin, and multiple mucocutaneous bleeding episodes in contrast to deep subcutaneous bleeding that happens in cases of hemophillia. These patients also have epistaxis, prolonged bleeding time, increased post traumatic bleeding, and increased postpartum bleeding episodes.[75] the severity of the symptoms depend on the type of vWD. Type I accounts for 60-70% of the cases with milder manifestations. Type II accounts for moderate signs and symptoms in the patients and type III is the severe variant of the disease.[76] Patients with type III can develop severe pain and swelling in the joints and soft tissues due to increased bleeding.

Oral Manifestations

Increased gingival bleeding during routine prophylaxis procedures and bleeding following teeth extraction are the common oral presentations of the disease. Red, soft, edematous gingiva with loss of stippling can be seen in these cases. The presence of ecchymosis and purpuric spots in the oral mucosa are frequently seen.[77]

Dental considerations

Before initiating dental treatment, diagnosis of the vWD needs to be confirmed with the hematologist. According to the type of the disease, dental treatment should be planned for the patients. Patients ought to be counselled about maintaining their oral hygiene practices. Before conducting any invasive procedures in the operatory, desmopressin (DDAVP) should be administered for prophylactic purpose to the patients (0.3 µg / kg (maximum 20µg)). Intraoperative bleeding should be controlled using the local heamostatic measures like gelfoam, fibrin glue, followed by good sutures.[77,78] Avoid aspirin and NSAIDs in these patients, however acetaminophen can be presecribed.[78] These patient's ned to be observed for 24-48 hours for any signs of bleeding and allergic reactions.

Afibrinogenemia

General Signs and Symptoms

It is an autosomal recessive coagulant disorders characterised by partial or complete absence of immunoreactive fibrinogen (less than 0.1g/L). These patients can occasionally develop muco-cutaneous and post-traumatic or soft tissue bleeding. Females have been reported to have excessive menstrual haemorrhage. Delayed wound healing has also been witnessed in some of these patients.[79]

Oral Manifestations

(Similar to other coagulation disorders)

Dental considerations

Dentists commonly encounter these patients as the diagnosed cases of Afibrinogenemia since the neonatal age.[80] The preventive treatment plan should be customized for these patients. These patients should be educated first about the severity of the disease and its impact on the dental tissues. Fluoride varnishes must be applied in these patients every six months to prevent dental decay. Deep pits and fissures on the teeth should be filled with either GIC or composites. Oral prophylaxis is indicated in these patients with minimal soft tissue damage, as there is a risk of excessive bleeding. Minor invasive surgical procedures should be dealt cautiously, and blood coagulation test is mandatory. If the blood fibrinogen levels are below 100mg/dl, the prophylactic Plasma Derived Fibrinogen Concentrate, Cryoprecipitate or Fresh Frozen Plasma (FFP) should be administered to the patients.[80,81]

Antifibrinolytics, in combination with fibrinogen replacement, are helpful in the control of mucosal bleeding, especially bleeding during dental treatments. Epsilon aminocaproic acid (50-60 mg / kg every four to six hours) and tranexamic acid (20-25 mg / kg every 8 to 12 hours) can be administered orally or intravenously. Antifibrinolytics like Epsilon aminocaproic acid (50-60mg/kg every 4-6 hrs) can be used in conjunction with the fibrinogen replacement to control the intraoral bleeding following the dental procedures.[82]

Conclusion

Children with various HBDs are a significant challenge for clinicians. A child with mild/moderate bleeding signs is nevertheless a diagnostic difficulty. The early stage in the evaluation would be to objectively quantify his or her bleeding symptoms, followed by objectively quantifying the bleeding symptoms of his or her family members. Finally, if a bleeding disease is detected, specific tests must be performed. Coagulation factor deficiency screening tests are believed to be trustworthy, routinely available, and simple to use. However, the numerous screening tests for primary hemostatic abnormalities have not yet proven to be reliable, requiring a referral for an expert haematology consultation and particular laboratory testing.

The current paradigm emphasises that the patients with bleeding disorders can be managed safely in a dental setup if certain guidelines are followed. Dentists must be aware of about the clinical presentation of these disorders, possibility of the associated bleeding complications, and management protocols that need to be devised as an outcome. It is important to ensure clear channels of communication and close collaboration with the haematologist prior to any dental procedure. Taking a thorough A good, elaborative medical history, adhering to hemostasis principles, and applying sound clinical judgement together help to ensure that patients with bleeding disorders receive effective dental therapy.

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