

Literature Review

Recent pharmacological management of oral bleeding in hemophilic patient

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ABSTRACT

Background: Hemophilia is a hereditary bleeding disorder that can increase the risk of disease in oral cavity. Sometimes hemophilia is not always established already in a patient. The lack of awareness of hemophilia presence can cause serious problem. **Purpose:** The purpose of this review is to explain about dental bleeding manifestation and management in hemophilic patient. **Reviews:** Hemophilia can be manifested as dental bleeding that cannot stop spontaneously. It should be treated with factor VIII either by giving whole blood, fresh plasma, fresh frozen plasma, cryoprecipitate, and factor VIII concentrate. Factor VIII dose for hemophilia treatment can be calculated based on factor VIII present in hemophilia patient's body. Factor VIII can also be given as prophylaxis to prevent bleeding. Complications that can be caused by factor VIII replacement therapy are the presence of factor VIII inhibitor and transfusion related diseases. Treatment of dental bleeding due to hemophilia consists of factor replacement therapy and supportive therapy. **Conclusion:** Treatment of dental bleeding due to hemophilia consists of factor replacement therapy and supportive therapy. There are complications that can happen due to factor VIII replacement therapy that should be considered and anticipated.

Key words: Hemophilia patient, oral bleeding, management

ABSTRAK

Latat belakang: Hemofilia adalah kelainan pembekuan darah yang diturunkan. Hemophilia dapat meningkatkan resiko penyakit rongga mulut. Hemofilia tidak selalu sudah terdiagnosa saat penderita melakukan kunjungan ke dokter gigi. Kurangnya kewaspadaan akan adanya hemofilia dapat menyebabkan masalah serius. **Tujuan:** Tujuan dari kajian pustaka ini adalah memaparkan tentang manifestasi dan penanganan perdarahan gigi pada penderita hemofilia. **Tinjauan pustaka:** hemofilia dapat bermanifestasi sebagai perdarahan gigi yang tidak dapat berhenti secara spontan. Pada keadaan perdarahan tersebut, pemberian faktor VIII yang diberikan sebagai whole blood, fresh plasma, fresh frozen plasma, cryoprecipitate, dan konsentrat faktor VIII. Dosis faktor VIII sebagai terapi hemofilia dapat dihitung berdasarkan kadar faktor VIII yang terdapat dalam tubuh penderita hemofilia. Faktor VIII juga dapat diberikan sebagai terapi profilaksis untuk mencegah perdarahan. Komplikasi yang dapat terjadi pada pemberian faktor VIII replacement therapy adalah timbulnya inhibitor faktor VIII dan penyakit yang terkait transfusi. Terapi perdarahan gigi pada penderita hemofilia terdiri dari factor replacement therapy dan terapi suportif. **Kesimpulan:** Terapi perdarahan gigi pada penderita hemofilia terdiri dari factor replacement therapy dan terapi suportif. Komplikasi factor VIII replacement therapy harus diwaspadai dan ditatalaksana dengan baik.

Kata kunci: Pasien hemofilia, perdarahan mulut, tatalaksana

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INTRODUCTION

Spontaneous bleeding in oral cavity can easily happen, due to gingival bleeding. The risk of gingival bleeding

during brushing teeth causes poor oral hygiene in most hemophilic patient. The poor oral hygiene will increase the risk of disease in oral cavity, due to dental caries or periodontal disease. Morbidity and death are primarily the

result of hemorrhage, although infectious diseases (eg, HIV, hepatitis) became prominent.¹

Hemophilia is an X-linked chromosome disorder and will be manifested as bleeding due to clotting factor deficiency. Hemophilia must be suspected in patients with abnormal bleeding tendency. Deficiencies of factor VIII and IX are the most common severe inherited bleeding disorder.¹

The classification of the severity of hemophilia has been based on either clinical bleeding symptoms or on plasma procoagulant levels; the latter are the most widely used criteria. Persons with less than 1% normal factor (< 0.01 IU/mL) are considered to have severe hemophilia. Persons with 1–5% normal factor (0.01–0.05 IU/mL) are considered to have moderately severe hemophilia. Persons with more than 5% but less than 40% normal factor (> 0.05 to < 0.40 IU/mL) are considered to have mild hemophilia.^{1,2}

The treatment of hemophilia may involve management of hemostasis, management of bleeding episodes, use of factor replacement products and medications, treatment of patients with factor inhibitors, and treatment and rehabilitation of patients with hemophilia synovitis. Treatment of patients with hemophilia ideally should be provided through a comprehensive hemophilia care center.¹

To stop the bleeding, factor that is deficient should be given. Several options for factor VIII replacement therapy are: whole blood, fresh plasma, fresh frozen plasma, cryoprecipitate, and factor VIII concentrate. Although factor VIII concentrate has been given, bleeding can still happen due to inhibitor factor VIII. Inhibitor factor VIII should be managed well to prevent prolonged bleeding.²

Etiology, pathophysiology, and laboratory examination of hemophilia

Hemophilia is a hereditary bleeding disorder. Hemophilia A is caused by an inherited or acquired genetic mutation or an acquired factor VIII inhibitor, while hemophilia B is factor IX deficiency. The defect results in the insufficient generation of thrombin by the FIXa and FVIIIa complex by means of the intrinsic pathway of the coagulation cascade. It creates an extraordinary tendency for spontaneous bleeding.^{1,3,4} Hemophilia was stated in 1820 as bleeder's disease transmitted by unaffected females to their son. This disorder is inherited in an X-linked recessive pattern. Prolonged clotting time was found in hemophilia patient. Hemophilia is caused by decrease of factor VIII levels.^{4,5}

Factor VIII deficiency, dysfunctional factor VIII, or factor VIII inhibitors lead to the disruption of the normal intrinsic coagulation cascade, resulting in spontaneous hemorrhage and/or excessive hemorrhage in response to trauma. Hemorrhage sites include joints (eg, knee, elbow), muscles, CNS, GI system, genitourinary system, pulmonary system, and cardiovascular system.⁴

Platelet count, activated partial thromboplastin and prothrombin test are screening tests if there is suspicion of hemophilia. Specific test needed to diagnose hemophilia is factor VIII assay.⁶ In patients with hemophilia, there will

be prolonged activated partial thromboplastin time (APTT), normal platelet count, and normal prothrombin time (PT). Specific assay for factor VIII is needed to know which factor is deficient.^{2,7}

Clinical manifestation of hemophilia

Bleeding symptoms may be present from birth or may occur in the fetus.^{1,8} Like other parts of the body, hemophilia will also give effect to oral cavity such as dental caries or gingivitis. Hemophilia patients will be afraid to brush their teeth and afraid to receive dental treatment because they fear about bleeding that may occur. Every dental management must be done very carefully to prevent bleeding.¹

Suspicion should always be raised in the presence of abnormal bleeding. Although there can be considerable overlap, in general, platelet problems result in petechiae, especially on dependent parts of the body and mucosal surfaces. Ecchymoses are suspicious for coagulation factor deficiencies or platelet problems when they occur in unusual areas, are out of proportion with the extent of described trauma, or are present in different stages of healing.⁹

Management of hemophilia

To stop the bleeding, factor that is deficient should be given. In hemophilia A patients, factor VIII should be given. There are several options for factor VIII replacement therapy, such as: whole blood, fresh plasma, fresh frozen plasma, cryoprecipitate, and factor VIII concentrate. Whole blood contains the least factor VIII. Cryoprecipitate or fresh frozen plasma is considerably less effective and less safe. The best treatment is factor VIII concentrate.^{2,10–13}

The in vivo percent elevation in factor VIII level can be estimated by multiplying the dose of AHF per kilogram of body weight (IU/kg) by 2%. We will know the factor VIII increment needed by measuring the factor VIII the patient had and increased it to the normal level. Factor VIII needed to stop the bleeding is calculated by multiplying expected % factor VIII increase with body weight and divided it with 2%/IU/kg.^{14,15}

In oral bleeding, topical thrombin can be applied especially if bleeding is minimal or has been for only a few hours.¹⁶ Prophylaxis factor VIII can be given every 2–3 days to maintain the normal level of factor VIII.^{17,18}

Supportive management that can be done to stop the bleeding in hemophilia patient are rest, ice, compression, and elevation (RICE).⁹ In addition, chlorhexidine gluconate mouthwash can be used to control periodontal problems. Blood loss of all kinds can be controlled locally with direct pressure or periodontal dressings with or without topical antifibrinolytic agents.¹⁹

Complications that can be caused by factor VIII replacement therapy are the presence of inhibitor and transfusion related diseases.²⁰ Transfusion related diseases above all are HIV, hepatitis, cytomegalovirus, Epstein-barr virus, syphilis, malaria, etc. The most prevalent transfusion related diseases are HIV and hepatitis.²¹

DISCUSSION

Hemophilia was called royal disease because it spread to the royal families of Europe through Victoria's descendants. It was untreatable and only a few hemophiliacs survived to reproductive age because any small cut or internal hemorrhaging after even a minor bruise were fatal, until recently it is treated with factor replacement therapy.²² Positive family history is not always available, and it complicates the diagnosis of hemophilia. A retrospective descriptive study done from January 2007–December 2010 done in RD Kandou Hospital Manado found only 5 of 21 patients (23.8%) had positive family history.²³

The major signs and symptoms of hemophilia are excessive bleeding and easy bruising. The extent of bleeding depends on the type and severity of the hemophilia. Children who have mild hemophilia may not have symptoms unless they have excessive bleeding from a dental procedure, an accident, or surgery. Bleeding can occur on the body's surface (external bleeding) or inside the body (internal bleeding). Signs of excessive external bleeding include: bleeding in the mouth from a cut or bite or from cutting or losing a tooth, nosebleeds for no obvious reason, heavy bleeding from a minor cut, and bleeding from a cut that resumes after stopping for a short time.²⁴

Platelet count must be included among the basic screening tests for patients exhibiting a bleeding diathesis. Prothrombin test is the time taken by a recalcified citrated platelet poor plasma to clot in the presence of tissue thromboplastin & phospholipids. It is a very good screening tests for coagulation factors involved in the extrinsic and common pathway of coagulation—namely VII, X, V, II and I. Activated partial thromboplastin is the time taken by a recalcified citrated platelet poor plasma to clot in the presence of a surface activator (silica, koalin or ellagic acid) and phospholipid (partial thromboplastin). It is good screening test of coagulation factors involved in the contact activation and common pathway namely XII, XI, IX, VIII, X, V, II and I. Specific test needed to diagnose hemophilia

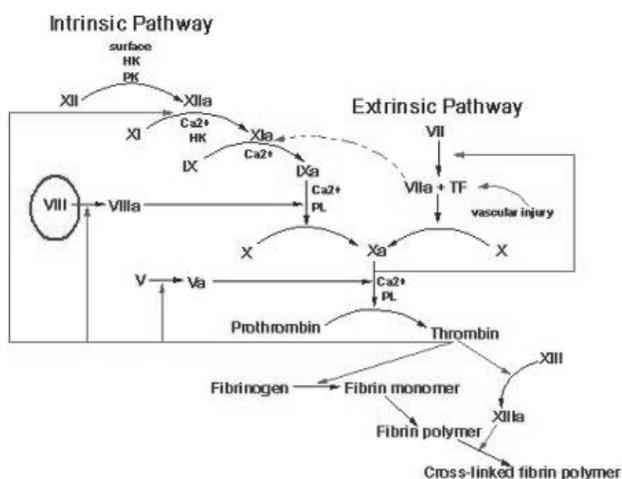


Figure 1. Factor VIII action in haemostatic function.²

is factor VIII assay.⁶ Factor VIII is involved in intrinsic pathway of haemostatic process. Factor VIII is needed to convert factor X to be factor Xa, which in turns will convert prothrombin to be thrombin. Thrombin is needed to convert fibrinogen to be fibrin which needed to stop bleeding (Figure 1). That is why in patients with positive bleeding history or active bleeding should have platelet count, PT and PPT test. In patients with hemophilia, there will be prolong PPT, normal platelet count, and normal PT. Specific assay for factor VIII is needed to know which factor is deficient.^{2,7}

Management of hemophilia consists of supportive and specific therapy. Specific therapy is factor replacement therapy, which available in several forms that should be given according to the availability of the agent. Supportive therapy for dental bleeding consist of avoidance of giving antifibrinolytic agent systematically, evaluate the presence of anemia, topical agent supplementation (thrombin/fibrin sealant, ice, pressure), and soft diet. Dental care should be done very carefully. Before any dental procedure that may cause bleeding, factor replacement therapy should be given first.²⁵ Desmopressin acetate can also be given intranasal with 0.2–0.4 mcg/kg/dose, 2 hours before procedure.²⁶

There are several things to remember in dental check up for hemophilia patient: antibiotics should be taken before all invasive procedures, factor VIII replacement therapy should be given if there is prolonged bleeding after teeth cleaning work, pretreatment with factor concentrate or short term hospitalization may be required for oral surgery and periodontal treatment in hemophilia patient, pretreatment with an antifibrinolytic agent and possibly infusion of factor concentrate if there is likelihood of bleeding difficulties after dental treatment, and if the patient had regular prophylaxis regimen, dental treatment should be done in the same day with the prophylaxis treatment day.²⁷

In hemophilia patient, accidents involving the mouth may happen, especially during childhood. When bumps, falls, and collisions occur, there are several things that can be done: we should pick up the tooth by the crown, avoiding the roots, rinse it off, and place in milk, if possible so that the tooth may be reinserted. While waiting for the process, apply firm pressure to the bleeding site with a piece of clean gauze. Patient must go directly to the emergency room if there are bleeding on the tongue, cheek, or floor of the mouth doesn't stop; the tongue, throat, or neck is swollen or bruised; or there is trouble to breath or swallow. We should prevent the clot from breaking away from the wound site after an injury or extraction with treatment that can include an antifibrolytic agent, factor concentrate, or desmopressin nasal. A word to the wise about preventing emergencies: children with hemophilia should always wear mouth guards when they play sports.²⁷

It is essential to prevent accidental damage to the oral mucosa when carrying out any procedure in the mouth. Injury can be avoided by: using saliva ejectors carefully; removal of impressions carefully; extra care in the placement of X-ray films, particularly in the sublingual region; giving

protection to the soft tissues during restorative treatment by using a rubber dam or applying yellow soft paraffin (vaseline®).²⁷

Previously, when factor VIII concentrate is still not available, blood product such as whole blood and cryoprecipitate are used to replace the need of factor VIII concentrate. Lately, factor VIII concentrate is used to replace the need of factor VIII concentrate. In 1970, the factor VIII available is acquired from many donors by separating factor VIII from plasma. This way, the treatment can be given right away and it can be given at home. Unfortunately, at 1980, it is reported that many virus can be transmitted from factor VIII concentrate replacement therapy. In 1984, recombinant factor VIII technology is developed. Today, recombinant factor VIII therapy is available.^{28–30}

Factor VIII replacement therapy can have several complications i.e. the presence of inhibitor and transfusion related diseases.^{29,31} The most prevalent transfusion related diseases are HIV and hepatitis.³² If factor VIII concentrate has been given, but no significant improvement is present, factor VIII inhibitor should be considered. To confirm the present of factor VIII inhibitor, blood analysis should be done. It is reported that factor VIII inhibitor is common in patients treated with factor VIII recombinant replacement therapy.³³

To overcome the presence of factor VIII inhibitor, the amount of factor VIII concentrate given to the patient should be increased or a by passing agent can be given. By passing agents are prothrombin complex concentrates and activated prothrombin complex concentrates. In 1990, recombinant activated factor VII was used to overcome the factor VIII inhibitor.³⁴

It is concluded that treatment of dental bleeding due to hemophilia consists of factor replacement therapy and supportive therapy. There are complications that can happen due to factor VIII replacement therapy that should be considered and anticipated.

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