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Factor V11 deficiency: A rare cause of nasal bleeding

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Abstract

Factor VII deficiency is a rare inherited disorder. Clinically the patient presents with bleeding tendencies. Diagnosis is made by prolonged prothrombin time, normal activated partial thromboplastin time and low functions factor VII assay or factor VII antigen. Therapy involves factor VII concentrates, recombinant factor VII, fresh frozen plasma and fibrinolytic inhibitors. We present a 6 years old boy with nose bleed for six months of whom prothrombin time was prolonged with functional factor VII assay of less than 1% confirming factor VII deficiency. He was managed with fresh frozen plasma, blood transfusion, tranexamic acid. Factor VII deficiency even though rare should be sought out in children presenting with bleeding.

Keywords: Factor VII deficiency; coagulation; hemorrhage.

Introduction

Factor VII (FVII) deficiency is a rare clotting factors disorders with a prevalence of 1/500,000 [1,2]. Being a vitamin K dependent factor and manufactured by the liver levels in the blood can be altered not only in liver diseases but also in vitamin K deficiency state. Clinically the patient can present with epistaxis (60%), gum bleeding (34%), bruises (36%), haemarthroses, menorrhagia (69%), intracranial hemorrhage (2.5%), gastrointestinal hemorrhage, muscle bleeding and post-partum hemorrhage [2,3]. This case represents the first of its kind to be reported in Northern Tanzania and propels a need to raise awareness of the condition emphasizing to consider FVII deficiency in children presenting with bleeding.

Diagnostic tests include functional FVII activity (FVII: C) assay, FVII antigen (FVII: a) assay and genetic testing [2]. Screening test include Prothrombin Time (PT), activated partial thromboplastin time (aPTT) and platelet count. It is also important to rule out vitamin K deficiency, liver disease, vitamin K inhibitors (warfarin) usage. In clinical history, there is familial history of early neonatal bleeding, bleeding tendency of symptoms in siblings and consanguinity within the marriage of parents [3].

Recommended treatment option for the condition includes recombinant factor VII, factor VII concentrates, Fresh Frozen Plasma (FFP), intermediate purity factor IX and fibrinolytic inhibitors [4]. We are presenting a case of a six years old boy with nose bleed and joint swelling who was diagnosed with factor VII deficiency.

Case presentation

A 6 years old boy was admitted with profuse nose bleeding for more than six months with the last reported nasal bleeding 2 days prior to the day of admission. The current admission was his second within a month, with a history of one unit of blood transfusion a month ago. In this admission complained of elbow and knee joint swelling with pain. He reported to have passed black tarry stool with visible worms for one week. He denied history of gum bleeding or easy bruising. There was no history of vomiting, headache, loss of vision or convulsions reported. He had no history of yellowish discoloration of the eyes, abdominal pain or swelling. The patient's older brother died with a severe nose bleed and blood loss at the age of seven years. Physical examination revealed a boy with active nose bleeding, which was controlled with gauze nasal packing, pallor and stable vital signs. Anthropometric measurement showed a normal weight for height. Musculoskeletal system had swelling of the elbow joint and knee joint on both legs (Figure 1), range of motions is slightly limited with tenderness, with a limping gait. Other systems were normal. Laboratory work up elaborated haemoglobin level 5.3 g/dl (Normal: 11.0-13.9 g/dl) [5], haematocrit 20% (Normal: 32-39%) [5], red cell distribution width of 33.4% (11.9-14.9%) [5] and thrombocytosis of 871 x 10^3/UL (Normal: 205 x 10^3 - 457 x 10^3/UL) [5]. There was leukocytosis with predominance of neutrophils. He had a prolonged PT of 64.3 seconds (Normal: 9.5-13.5 seconds), International Normalized Ratio (INR) 15.3 (Normal: less than 1.3) with normal activated partial thromboplastin time (aPTT) of 39.5 seconds (Normal: 35.5-39.6 seconds). Functional factor VII assay came back less than 1%. Other factors were not checked since the patient could not afford. Both liver and renal function test were normal. Brucellosis was suspected and Brucella Antigen IgG titers were positive 1:160, blood culture after seven days had no bacterial growth. Urinalysis was normal. Stool analysis revealed *Ascariasis lumbricoides* with abdominal ultrasound revealing a normal scan. After the work up, final diagnosis included Factor VII deficiency, Brucellosis and Ascariasis. Patient was treated with Ciprofloxacin, doxycycline, albendazole, tranexamic acid, Vitamin K, two blood transfusion and fresh frozen plasma. He was discharged after seven days with oral ciprofloxacin to complete brucellosis course treatment. Being a limited resource hospital we lack FVII concentrates or recombinant activated factor VII. The patient was followed up at our haematological clinic and progressed well.

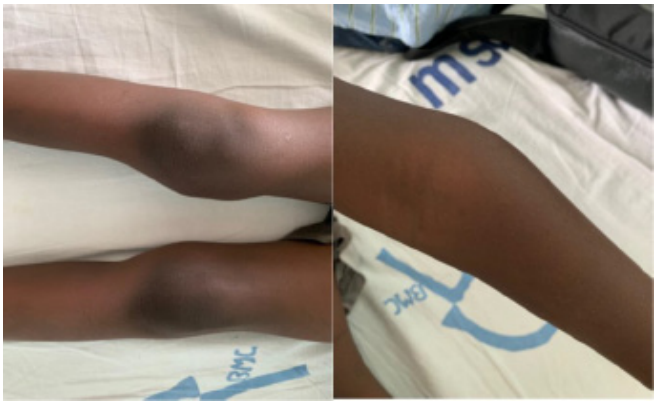

Figure 1: Knee joints swelling with slight tenderness causing a limping gait (Left image)) left elbow joint swelling (Right image).

Discussion

Factor VII deficiency is an autosomal recessive inherited rare disease. It can present as type I which is a quantitative defect or type II being the qualitative defect with the latter having normal factor VII antigen while the former presenting with both low FVII:C and FVII:Ag [4]. The factor VII gene is located at chromosome 13q34 and several mutations within this gene lead to low levels of FVII [2,6]. Clinically the symptoms do not tally with the levels of FVII with some patients having mild to moderate deficiency but presenting with severe bleeding. Apart from the enigma between the deficiency and the clinical manifestation, age of presentation is also not specific ranging from those with severe deficiency at neonatal period with intracranial hemorrhages to those who present in late childhood or adulthood with nose bleeds, excessive bleeding during surgical procedures or menorrhagia in females with nose bleeding (60%) as the most common presentation [2,3]. Severe bleeding occurs when the FVII: C level are below 2% [4] as seen in the index case whereby the boy had less than 1% of FVII:C with a profuse nose bleed and a possible gastrointestinal bleeding with black tarry stool. Molecular PCR analysis has been used in cases were inheritance pattern is indeterminate and gene analysis is performed prenatally for known bleeding tendency in the family [7]. Our case presented with symptoms at 5 to 6 years of age with nose bleeding, joint swelling, black tarry stool all and with a history of the older brother's death at seven years secondary to profuse bleeding suggesting defect in the coagulation pathway . In the initial coagulation test, PT prolongation with normal aPTT concurred with FVII deficiency [8,9] since clinical history had ruled out anticoagulant usage or rodenticide poisoning and liver disease ruled out after liver function tests and abdominal ultrasound came back normal. The management of FVII deficiency comprise of replacement therapy with either FVII concentrates or recombinant FVII (rVII). FVII concentrates are given at a dosage of 10-50 U/kg up to 3 times in a week which has shown efficacy [10]. The rVII has a shorter half-life than the concentrate especially in children [11]. The dosage of 20-25 µg/kg four to six hourly in severe bleeding or surgery suffices [2]. In addition, FFP has been used to treat FVII deficiency with a potency of 1 IU/mL and carries a risk of fluid overload [7]. Other supportive treatments include fibrinolytic inhibitors such as tranexamic acid and intermediate purity factor IX concentrates (contraindicated in liver disease, premature neonates and in major trauma since they carry a risk of thrombosis) [2]. The choice of therapy depends also on what is available, with the replacement therapy being the best choice but applicability is limited due to high cost and are not readily available at our facility which led to FFP chosen as the preferred therapy with adjuvant therapy including the fibrinolytic inhibitor. The mainstay is to maintain the FVII: C above 15% so as to reduce the risk of bleeding [12].

Conclusion

Known to be a rare disease, FVII deficiency still should be searched for in a child presenting with bleeding especially with a positive familial history of bleeding tendency.

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Ethics approval and consent to participate: Written informed consent was obtained from the patient's legal guardian for publication of this case report was granted by the joint Catholic University of Health and Allied Sciences/Bugando Medical Centre Research and Ethical review committee. Consent for publication Written informed consent was obtained from the patient's legal guardian(s) for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal. Additionally, consent was sought and granted by the Catholic University of Health and Allied Sciences Directorate of Research and Publication to publish this work. A copy of the clearance document is also available for review by the Editor-in-Chief of this journal.

References

1. Sevenet PO, Kaczor DA, Depasse F. Factor VII Deficiency: From Basics to Clinical Laboratory Diagnosis and Patient Management. Clin Appl Thromb Hemost. 2017; 23: 703-710.
2. Perry DJ. Factor VII Deficiency. Br J Haematol. 2002; 118: 689-700.
3. Mariani G, Herrmann FH, Dolce A, Batorova A, Etro D, Peyvandi F, et al. Clinical phenotypes and factor VII genotype in congenital factor VII deficiency. Thromb Haemost. 2005; 93: 481-487.
4. Napolitano M, Siragusa S, Mariani G. Factor VII Deficiency: Clinical Phenotype, Genotype and Therapy. J Clin Med. 2017; 6.
5. Rozenberg G. Paediatric Reference Ranges. Microscopic 3E Haematology.
6. Bernardi F, Mariani G. Biochemical, molecular and clinical aspects of coagulation factor VII and its role in hemostasis and thrombosis. Haematologica. 2021; 106: 351-362.
7. Lapecorella M, Mariani G. Factor VII deficiency: defining the clinical picture and optimizing therapeutic options. Haemophilia. 2008; 14: 1170-1175.
8. Allen GA, Glader B. Approach to the bleeding child. Pediatr Clin North Am. 2002; 49: 1239-1256.
9. Blanchette VS BV, Revel-Vilk S (eds), editor. SickKids Handbook of Pediatric Thrombosis and Hemostasis. Basel, Karger. 2013.
10. Cohen LJ, McWilliams NB, Neuberg R, Zinkham W, Bauer K, et al. Prophylaxis and therapy with factor VII concentrate (human) immuno, vapor heated in patients with congenital factor VII deficiency: A summary of case reports. Am J Hematol. 1995; 50: 269-276.
11. Lindley CM, Sawyer WT, Macik BG, Lusher J, Harrison JF, et al. Pharmacokinetics and pharmacodynamics of recombinant factor VIIa. Clin Pharmacol Ther. 1994; 55: 638-648.
12. Mahale R, Rathi P, Ginegiri C, Aggarwal R. Factor VII Deficiency: A Rare Case Report. Indian J Hematol Blood Transfus. 2010; 26: 68-69.