Case Report

Severe factor x deficiency in pregnancy-an obstetric challenge

Abstract

Inherited factor X deficiency has an estimated prevalence of 1 in 500000. There are very few published case reports of factor X deficiency in pregnancy, each with a unique clinical course and approach to management. Here, we re-emphasize the approach to a patient with severe factor X deficiency, who had a successful pregnancy through the rationale use of FFP.

Keywords: factor x, fresh frozen plasma, external cephalic version, prothrombin complex concentrates, tranexamic acid, prothrombin time, activated partial thromboplastin time

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Shilpa Venkatesh,[1] Cecil Ross,[1] Vani Ramkumar[2]

[1]Department of Obstetrics & Gynecology, St. John's Medical College & Teaching Hospital, India
[2]Department of Hematology, St. John's Medical College & Teaching Hospital, India

Correspondence: Shilpa Venkatesh, Department of Obstetrics & Gynecology St. John's Medical College & Teaching Hospital Bangalore, India, Tel +91-9845726200, Email shilpavenkatesh1280@gmail.com

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Abbreviations: FX, factor X; FX,C, factor X coagulant; FFP, fresh frozen plasma; PCC, prothrombin complex concentrate

Case report

A 23year old lady with one previous abortion, presented to the antenatal outpatient department of St. John s Hospital, for the first time at 20weeks of gestation. She gave a history of prolonged bleeding following trivial trauma since childhood which stopped on compression. She also had hemarthrosis and spontaneous gum bleeds since childhood. At puberty, she gave history of menorrhagia which responded to oral Tranexamic acid. At 17years of age, patient had a severe episode of menorrhagia leading to hemorrhagic shock. She received multiple blood products and eventually required bilateral uterine artery ligation and a few haemostatic sutures on the uterus (exact details of which are not known and have not been documented). Soon after marriage, at 21years of age, she was diagnosed to have blighted ovum and presented later with incomplete abortion, for which she received Misoprostol. She had heavy bleeding leading to severe anemia and a provisional diagnosis of disseminated intravascular coagulation was made. Her investigations at that time were Prothrombin time 102s, Activated thromboplastin time 65.5 s, INR 8.5, Factor X levels were <1% with normal platelet count and morphology. Thus, a diagnosis of severe factor X deficiency was made. During the present pregnancy, she was referred to the antenatal outpatient department. She had developed gestational diabetes mellitus which was controlled with diet. The antenatal period was uneventful. As there was no significant bleeding in this pregnancy, the coagulation parameters were not repeated until term. Ultrasound done at 37weeks confirmed a flexed breech presentation. At 37weeks of gestation, patient received FFPs at 1 bag/10kg body weight to assess her laboratory haemostatic parameters and her investigations were as shown in Table 1. Elective cesarean delivery was planned at 38weeks of gestation and external cephalic version was not considered due to the previous scar on the uterus (i.e. haemostatic sutures on the uterus following an episode of menorrhagia at 17years of age). Patient underwent emergency cesarean delivery at 37weeks of gestation, as a spontaneous retro placental bleed of about 50ml was seen on ultrasound. Patient again received the same dose of FFP and 2g of intravenous Tranexamic acid preoperatively. A healthy baby boy of weight 2.5kg was delivered as flexed breech. A previous scar was noted on the uterus. Both ovaries were normal. Intraoperatively, a peritoneal drain was left in situ. Patient developed hematuria which cleared after 12hours. Postoperatively, patient received 3units of FFP and 1g intravenous Tranexamic acid 8 hourly for 48hours and then followed by 2units of FFP and 1g intravenous Tranexamic acid 12hourly till the seventh postoperative day. Sutures were removed on the seventh postoperative day. Postoperative period was uneventful. Patient has come for follow-up and has had no signs of postpartum hemorrhage till 6weeks postpartum.

Table 1 Coagulation Parameters Before and After FFP Transfusion

	Prothrombin time	Activated thromboplastin time
Before FFP	23s	40s
After FFP	14.9s	28s

Discussion

Two independent research groups identified factor X deficiency for the first time during the 1950s and the factor was named Stuart Prower factor. Factor X is a Vitamin K dependent, serine protease produced in the liver that plays a pivotal role in blood coagulation as the first enzyme in the common pathway to fibrin formation. Factor X levels, like other coagulation factors are known to increase in pregnancy. Normal factor X levels are 50-150%. Factor X rises at 12weeks of gestation and the trend continues to a peak of 163% at 30weeks. A secondary rise to 173% occurs at 144hours postpartum, the level again approaching the non-pregnant levels at 6weeks after delivery[1] Inherited Factor X (FX) deficiency is a rare autosomal recessive bleeding disorder with an estimated prevalence of 1:500000.[2] Factor

X deficiency is more common in parts of the world where there is increased incidence of consanguinity.[3]The prevalence of heterozygous FX deficiency (carrier state) may be as high as 1:500.[4] This patient was the only child of parents from a non-consanguineous marriage. A proposed classification of severity is based on factor X coagulant (FX: C) activity measurements: a FX: C measurement <1% is severe, 1-5% is moderate and 6-10% is mild.[5] Thus, this patient had severe FX deficiency. The level of FX necessary to achieve haemostasis is not known but it has been suggested that levels of 10-35% may be adequate.[6] Patients with severe FX deficiency may present in the neonatal period with umbilical stump bleeding (usually when the stump falls off at 7-14days), or intracranial hemorrhage. Moderately affected patients may be recognized only after haemostatic challenge, such as surgery, trauma or menses. Mild deficiency may be diagnosed during routine screening or because of a positive family history. The most frequent symptom, irrespective of the severity of deficiency, is epistaxis (seen in 72% of the patients). Congenital deficiency of FX is usually diagnosed by a concomitant prolongation of the Prothrombin time and activated partial thromboplastin time, and a functional assay for Factor X which will reveal a deficiency of the clotting factor. While no purified FX concentrate is commercially available, homeostasis can be achieved using Fresh frozen plasma (FFP) or Prothrombin complex concentrate (PCC) (factor IX complex which also contains factor X, factor II and factor VII) or BPL factor IXA (Bio-product laboratory factor IXA). The first successful pregnancy with FX deficiency was reported by Brody and his colleagues[7] and they concluded that FX deficiency was greatly ameliorated during pregnancy and did not require factor replacement. The coagulation parameters in our patient had improved during pregnancy when compared to non-pregnant levels. Konje et al.[8] reported a case of FX deficiency which was complicated by recurrent retro placental bleeding in the antenatal period which was managed conservatively by the use of BPL factor IXA (composition per unit: 500 IU factor X, 500 IU ant thrombin III, 550 IU factor IXA, 600 IU factor II and 5000 IU Heparin). Kumar & Mehta[9] reported four pregnancies in one woman with FX deficiency, theorizing that prophylactic clotting factor replacement was instrumental in the favorable pregnancy outcome. Our case is similar to the one reported by Bofill et al.[10] where clotting factor replacement was not done during antenatal period. We have used FFP for management since prothrombin complex concentrates were not available in our setting. PCC are now the preferred treatment since they are virally inactivated, and the risk of volume overload during treatment of severe hemorrhage is less compared with fresh frozen plasma. Kelso et al.[11] have reported a case of accidental hemorrhage with hypofibrinogenemia following external cephalic version.[11] Hence, in our patient external cephalic version was not considered because of the previous scar on the uterus and her bleeding disorder.

Conclusion

This case report highlights the management of a patient with severe FX deficiency who had a successful pregnancy through the rational use of fresh frozen plasma, thereby minimizing her hemorrhagic risks.

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None.

Conflict of interest

Author declares that there is no conflict of interest.

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