

Acquired Factor VII Deficiency in Association with Pyelonephritis

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Abstract

Acquired factor VII (FVII) deficiency in the absence of vitamin K deficiency, oral, synthetic liver dysfunction, or DIC is rare, with only a handful of cases published in literature. Congenital deficiency of FVII is well known but, little is known about secondary FVII deficiency and its management. The knowledge of this syndrome should avoid false diagnosis of congenital factor VII deficiency. Here, we present the report of a young woman who presented with pyelonephritis, anaemia, prolonged prothrombin time and normal activated partial prothrombin time (aPTT). She was diagnosed to have acquired FVII deficiency and this was the first such case with pyelonephritis.

The discovery of vitamin K-dependent factors evolved slowly, after the initial identification of the role of prothrombin in blood clotting 100 years ago. Isolated acquired FVII deficiency in the absence of vitamin K deficiency, coumadin therapy, synthetic liver dysfunction, or overt DIC is rare, having been described in only a handful of cases. Associated disease states have included malignancy,¹ aplastic anemia,^{2,3} and antiphospholipid antibodies.^{3,4}

Case Report

A 23 year old female presented with complaints of fever for 10 days which was high grade and continuous. H/o 4 episodes of vomiting only for 1 day present which contained eaten food particles and was non-bilious, non-blood stained. H/o increased frequency of urination present. H/o easy bruisability. No H/o blood in stools, vomitus or urine. No h/o epistaxis, mucosal bleeding, menorrhagia, bleeding in joints. No h/o burning micturition, pain abdomen, cough, sore throat, breathlessness, chest pain, palpitations, ear discharge, rash, previous blood transfusions, hepatotoxic drug intake and consanguinity. No H/o diabetes, hypertension, TB in past. No H/o bleeding disorder in family. Patient is vegetarian, non-alcoholic, non-smoker, recently married.

On examination, patient is conscious, co-operative, Pallor present, No Icterus, Clubbing, Lymphadenopathy, Cyanosis and Pedal Oedema. Two small patches

of bluish discoloration (ecchymosis) present over left leg. Pulse was 94 beats per min, regular, good volume with no special character. BP-110/70 Rt arm supine position, temp 101°F, RR-16/min thoraco-abdominal. P/A examination revealed tenderness over suprapubic area. There was no organomegaly and bowel sounds were present. Examination of chest, CVS and CNS was non contributory.

On Investigation: Hb-7.2 gm%, TLC-18000 per cumm, Dlc-78/15/02/05, platelet-4.4 lac per cumm, MCV-74.0 fL, MCH-26.6pg, MCHC- 29.5 per cumm, PCV- 24.4%, PBF- mild degree of anisocytosis with presence of normocytic normochromic cells with few microcytes. Mild hypochromia present, Corrected reticulocyte count-0.6%, S.Ferritin-12, Vit B12- 2000 pg/ml, ABoRh- 'B' positive, B. Urea-26, S. creatinine 1.1, S. sodium-136 mmol/L, S. Potassium- 3.7 mmol/L, LFTs-WNL, Total Protein- 6.4, Albumin-4.2, Globulin-2.2, Rapid MP- Non-reactive, Typhidot- Non Reactive, ECG-WNL, Chest X-ray- WNL, HBsAg- Non Reactive, HCV-Non reactive, HIV- Non reactive, urine C/E shows many pus cells, Urine C/S showed growth of E.coli sensitive to imipenem, meropenem, amikacin, Fosfomycin and NFT, Blood C/S- No growth. CECT Abdomen showed B/l Pyelonephritis. Keeping in view h/o easy bruisability and low Hb, prothrombin time was evaluated which came out to be prolonged with values Test-25.9 sec (control- 11.6 sec) INR-2.18, APTT-32 sec, BT-2'20", CT-5'50". Keeping in view prolonged PT, normal

Introduction

Factor VII is a vitamin K-dependent serine protease glycoprotein (also known as stable factor or proconvertin) with a pivotal role in hemostasis and coagulation. Other vitamin K-dependent factors include prothrombin, factors IX and X, and proteins C and S.

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Received: 26.07.2016; Revised: 09.01.2017;

Accepted: 21.12.2017

aPTT and low Hb, ANA, hsTTG (highly sensitive tissue transglutaminase) and factor VII was sent. hsTTG-7.4(normal), ANA came negative, Factor VII (done by photoptical clot detection) -11.90% (Ref value: 70.0-120.0). Levels of the factors II, V, VIII, IX, X and von-Willebrand factor were within the normal ranges. All factor levels were measured before the transfusion of fresh frozen plasma (FFP). Patient was treated with intravenous antibiotics, inj vit k, iron therapy and supportive treatment. Patient also received fresh frozen plasma @10ml/kg every 8 hourly for 2 days. Patient recovered and was discharged. Patient was followed up after 1 month with urine routine, urine culture, PT and Factor VII. All tests were within normal range.

Discussion

Congenital factor VII deficiency is a rare hereditary coagulopathy with a prevalence of 1 in 5,00,000 populations. It usually causes a bleeding tendency from mucosal membranes.⁵ Although, it is a congenital disease, the age of the patients at the clinical onset may differ depending on the severity of the deficiency. Central nervous system and gastrointestinal hemorrhages may be seen as early as infantile period.⁶ Given her negative personal and family history of bleeding in the past, negative ANA and hsTTG with the clinical picture of pyelonephritis, the diagnosis of an acquired FVII deficiency associated

with pyelonephritis was made. This is in accordance with a few reports indicating that sepsis and leukemia may trigger secondary FVII deficiency and that appropriate treatment of the underlying disease may correct the abnormally elevated haemostatic parameters.^{7,8} Although, isolated FVII consumption or proteolytic degradation by leukocyte proteases have been suggested as the possible causes of acquired FVII deficiency, definitive cause is unknown.⁷ Moreover, it is likely that the treatment of the pyelonephritis might have a considerable impact on the reversal of the hemostatic defect. Vit k injection can partially treat the deficiency. Treatment of infection itself can normalize PT. Blood products should be avoided but were given in this patient prophylactically to prevent major bleed as her INR was high and she had ecchymotic patches.

This case of acquired FVII deficiency is a rare and underdiagnosed entity. Physicians are not very familiar with it. With early diagnosis and treatment, patient's morbidity and mortality can be decreased.

Conclusion

Acquired factor VII deficiency may be seen during the course of pyelonephritis and should also be considered within differential diagnosis of the hemostatic defects in patients with infection and no history of bleeding in the past. Treatment includes replacement therapy as well as the treatment of underlying infection. Awareness of diverse clinical presentation of acquired FVII deficiency is essential to avoid mis-diagnosis and treatment delay.

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