CASE REPORT

IDIOPATHIC PURPURA FULMINANS IN DENGUE HEMORRHAGIC FEVER


ABSTRACT

Purpura fulminans is a rapidly progressive thrombotic disease that has been described during both severe bacterial and viral infections. Disseminated intravascular coagulation (DIC), antiphospholipid antibodies and acquired or congenital C and S protein deficiency are thought to play a role in its pathogenesis. Here we report the case of a 4-year-old girl who developed gangrene of all her fingers and toes following dengue shock syndrome complicated by DIC and also discuss its management.

Key words: Antiphospholipid antibodies, dengue hemorrhagic fever, purpura fulminans

INTRODUCTION

Purpura fulminans (PF) is a rare but serious condition that may occur during or after severe infections. It was first described in a patient with chickenpox in the 18th century as gangrenous skin lesion. Since then, it has been shown to be associated with gram-positive and gram-negative bacterial infections, meningococcal infections and some viral infections. The occurrence of antiphospholipid (APL) antibodies, disseminated intravascular coagulation (DIC) and antibodies to protein C and S is thought to play a role in its pathogenesis.

We report a case of a child who developed peripheral gangrene in the fingers and toes of both hands and feet during an episode of acute dengue viral infection and also discuss its management.

CASE REPORT

A 4-year-old previously healthy girl was admitted to one of the medical wards of the Lady Ridgeway Hospital for Children with a history of fever, vomiting and abdominal pain of 3 days’ duration. On admission she looked very ill and pale, with evidence of gum bleeding. She was febrile (temperature of 102°F) and drowsy. There was evidence of impeding shock (pulse rate 146 beats/ min, low volume; capillary refill time 5 s; systolic blood pressure 60 and diastolic 40 mmHg) and fluid leakage (pleural effusion and ascites). Therefore, a clinical diagnosis of grade III dengue hemorrhagic fever (DHF) with internal bleeding was made. She thus received rapid fluid resuscitation (both colloids and crystalloids), ionotropic support, a blood transfusion and other supportive measures. Her hemoglobin was 8 g/dl (normal 11.5-16.5 g/dl); white cell count, 2.08 x 10^9/L; platelet count, 40 x 10^9/L (later dropped to 15 x 10^9/L); hematocrit 0.25; AST, 295 (1-31 U/L); ALT, 228 (5-35 U/L) ; prothrombin time 24 s and INR 2.03. Her serum electrolytes and renal function tests were normal.

She developed generalized tonic-clonic seizures 20 min after admission and remained critically ill. At this point, she was transferred to the intensive care unit for further management and was electively ventilated immediately afterwards. A bluish discoloration of fingers and toes was noticed the following day, which progressively got worse over the next few hours to become gangrenous [Figures 1 and 2]. Multiple ecchymotic patches were also seen all over the body with bleeding from puncture sites. At this point, she developed multi-organ failure with evidence of DIC [D dimmers >8 mg/L (0.5 mg/L) ]; prothrombin time 24 s, activated partial thromboplastin time 29 s, INR 4.3. Hemagglutination inhibitor test for dengue-specific antibodies was positive with a titer of 1/2560, which was confirmatory of a recent secondary dengue infection.

Her 6-week stay in the ICU was further complicated by development of acute renal failure, for which she received peritoneal dialysis (11 days); meleana, which required several blood transfusions, and pneumonia. She was on the ventilator for a period of 22 days. Although her peripheral pulse had become normal in 3 days, the gangrenous areas became clearly demarcated with subsequent auto-amputation several weeks later. APL antibodies were detected in the acute illness. Both the Dilute Russel Viper Venom Test (DRVVT) and Kaolin Cephalin Time (KCT) were done to detect lupus anticoagulant. The DRVVT test revealed a LA1 61s (control 48s), LA2 42s (control 38s) and LA1/LA2 ratio 1.4, which indicated the presence of the lupus anticoagulant. Although all her routine investigations and coagulation
profile returned to normal, APL antibodies were still detectable, even 6 weeks after the illness. She was back again on her feet 14 days after her transfer out of the ICU following an intensive rehabilitation program comprising physiotherapy, occupational therapy, nutrition and language and speech rehabilitation.

DISCUSSION

PF usually manifests as a rapidly progressive purpura which may lead to skin necrosis, gangrene of limbs or digits and organ dysfunction. The condition has been mostly described to affect the fingers and toes in children.\(^4\) PF has been reported in children with severe bacterial and viral infections such as varicella and has also been shown to be associated with underlying metabolic disorders.\(^3\)\(^4\) However, to our knowledge this has not been described to be associated with severe dengue infections.\(^5\) DIC (with high D dimmer levels) and other coagulation abnormalities are seen in a majority of children with PF and also in those with severe dengue infections, as seen in our patient.\(^4\)\(^5\) However, our patient had both thrombotic (peripheral gangrene) and bleeding tendencies (melena, bleeding from puncture sites) at the same time. This posed as a serious management dilemma, as we were reluctant to administer low molecular weight heparin, which is routinely used to treat PF, due to her bleeding tendencies.

APL antibodies, auto antibodies to protein C or protein S, have been implicated in the pathogenesis of PF.\(^4\) The transient occurrence of APL antibodies has been described in both viral and bacterial infections and has been implicated in the pathogenesis of infection-associated thrombosis.\(^5\) Although APL antibodies were detected in our patient, they were still detectable 6 weeks after onset of illness. Apart from the persistently high APL antibodies, there was no other evidence to support the diagnosis of APL syndrome or SLE in this child. Therefore, it is difficult to determine if the presence of APL antibodies predisposed to the occurrence of PF during her episode of DHF.

REFERENCES


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