Case report

Severe Falciparum Malaria and Peripheral Gangrene

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Abstract

Patients with Falciparum malaria may present with peripheral gangrene as a rare complication. In this report we describe two adult Sudanese patients with high grade fever for 10 days, jaundice, alteration consciousness and hypovolaemic shock. Both patients had blackish discolouration of the fore foot and the toes, bilaterally. Blood smears showed hyperparacitaemia with Plasmodium falciparum. They were diagnosed as having severe malaria with peripheral gangrene; they were treated with quinine infusion and the foot lesions recovered spontaneously without surgical intervention.

Keywords: Gangrene, falciparum malaria, quinine

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Introduction

Malaria is one of the main diseases in the tropical areas, it is caused by different species and it has different clinical presentation. In patients with severe malaria caused by Plasmodium falciparum, the infected RBCs are attached to the endothelia of the peripheral micro circulation leading to occlusion of the small vessels without any effect on the major vessels. This condition is similarly found other conditions such as DIC, malignancy and severe sepsis (1,2,3). Two cases of severe falciparum malaria with peripheral gangrene are being reported.

Case Report 1

A 36-year-old female was brought to the Emergency Department, complaining high grade fever with rigors and chills for three days. Her fever was intermittent associated with nausea and frequent attacks of vomiting four days later, she became drowsy with shortness of breath. There was no history of diabetes mellitus, hypertension, dyslipidaemia or any underlying disease, alcohol consumption, or smoking.

On physical examination, the temperature was 39.8°C, pulse rate of 136/min, blood pressure was 90/56 mmHg and respiratory rate 28/min. There was yellowish discoloration of the sclera, with Glasgow coma scale of 12. She required ventilator support, isotonic saline and inotropic therapy (dopamine) to maintain arterial blood pressure. Cardiopulmonary examination revealed no abnormality apart from tachycardia and tachypnoea. Abdominal examination revealed no organomegaly. All the peripheral pulses were palpable. There was diffuse blackish discoloration of the fore foot with gangrenous toes bilaterally (Figure 1a, b and c).

The peripheral blood smear revealed 212 ring forms and 5 gametocytes of *Plasmodium falciparum* per 1,000 red cells, anaemia (haemoglobin 9.2 g/dl) and

(a)

(b)

(c)

Figures 1(a), (b) and (c): Showing dry gangrene of the toes bilaterally

normal platelet counts (234,000/mm^3). Blood chemistry revealed a slightly low blood glucose level (70 mg/dl) and signs of renal failure (blood urea nitrogen 66 mg/dl, creatinine 2.3 mg/dl) also there was a cholestatic jaundise (total bilirubin 3.75 mg/dl, direct bilirubin 2.6 mg/dl). Chest x ray was normal.

The patient was treated with intravenous infusion of quinine and quinine tablets, and good hydration. Dopamine was reduced and discontinued after 3 days of hospitalization. Parasites disappeared from the peripheral blood smear after 10 days of treatment. There was complete resolution of the gangrene in her lower extremities after 9 weeks.

Case Report 2

A 44-year-old female was brought to the Emergency Department complaining of high grade fever with rigors and chills for two days. Her fever was intermittent and associated with nausea and frequent attacks of vomiting which rendered her drowsy and confabulated. There was no history of diabetes mellitus, hypertension, dyslipidaemia or any underlying disease, alcohol consumption, or smoking.

On physical examination, the temperature was 38.8℃, pulse rate 126/min, blood pressure 100/60 mmHg and respiratory rate 24/min. There was yellowish discoloration of the sclera, her Glasgow coma scale of 14. She required oxygen therapy and i v fluid to maintain arterial blood pressure. Cardiopulmonary and abdominal examination revealed no organomegaly all peripheral pulses were palpable. There was diffuse blackish discoloration of the skin of the fore foot and dry gangrenous toes bilaterally (Fig.3).

The peripheral blood smear revealed 165 ring forms and 5 gametocytes of *Plasmodium falciparum* per 1,000 red cells, anaemia (haemoglobin 8.2 g/dl) and normal platelet counts (200,000/mm^3). Blood chemistry revealed a slightly low blood glucose level (72 mg/dl) and signs of dehydration (blood urea nitrogen 70 mg/dl, creatinine 2, 4 mg/dl) also there was a cholestatic jaundice (total bilirubin 4.3 mg/dl, direct bilirubin 2.6 mg/dl). PT, APTT were normal and chest x ray was normal.

The patient was treated with intravenous infusion of quinine and quinine tablets, and good hydration. Parasites disappeared from the peripheral blood smear

(a)

(b)

(c)

Figures 2 (a), (b) and (c): Dry gangrene of both feet day 30 showing good recovery of the skin of the forefoot.

following 8 days of treatment. There was complete resolution of the gangrene in her lower extremities after 6 weeks (Figure 2 a, b and c).

Discussion

Bilateral peripheral gangrene is an uncommon complication of falciparum malaria reported in many tropical countries. The pathogenesis is mulifactorial, however, most of the cases reported were associated with DIC (3, 4, 5, 6, 7). This may be attributed to the infected red cells which play a major role in triggering the protocoagulant activity and hence clotting cascade activation will render the small capillaries to be blocked. The presence of the tight package of the infected erythrocytes may make them less deformable and adherent to the endothelial wall thereby leading to micocirculatory obstruction.

The two patients described in the case reports, showed many clinical similarities in terms of developing cerebral malaria, hypovolaemic shock, renal impairment and bilateral limb gangrene in addition to the hyperparasitaemia, there was no evidence of DIC (8, 9, 10,11).

The affected feet of both patients were not detected earlier because of their dark coloured skin and after few days the skin of the forefoot and the toes showed dry and hard in appearance with diffuse blackish discoloration of the toes bilaterally.

Few studies suggest heparin or streptokinase for management of this condition (12, 13). None of the patients received aspirin or heparin because of the late discovery.

The resolution of the gangrene in our patients suggests the initial conservative approach to the management of symmetrical peripheral gangrene is successful. This allows time for the patient's condition to stabilize and the gangrenous lesions to become completely recovered.

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