Rhabdomyolysis Induced Acute Renal Failure: A Rare Complication of Falciparum Malaria

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Sir,

Acute tubular necrosis (ATN) is a leading cause of acute renal failure (ARF) in Plasmodium falciparum malaria. ATN is of ischaemic origin and related to multiple factors, such as blockage of microcirculation of internal organs, hypovolumia, disseminated intravascular coagulation (DIC), haemoglobinuria and haemolysis. However, rhabdomyolysis complicating falciparum malaria is occasionally described. We report a case of rhabdomyolysis with ARF caused by falciparum malaria. The renal function returned to normal with antimalarial drugs along with haemodialysis.

A 22 year male admitted in Nephrology ward with chief complaint of fever, vomiting and myalgia since 4 days and anuria since 2 days. There was no history of muscle trauma, seizure, myocardial infarction, and ingestion of anti-lipidaemic drugs (statins and fibrates) and other obvious cause of muscle injury.

On physical examination patient was febrile, pallor, icterus present and no oedema. His pulse was 90/min, regular, blood pressure was 130/80 mmHg and respiratory rate was 14/min. On systemic examination except for hepato-splenomegaly other systems did not reveal any abnormality. Laboratory findings showed: Hb-11g/dl, total leucocyte count 7.7x103 / µl, platelet count 1.84 x 105 /µl, blood urea 238 mg/dl, serum creatinine 10.6 mg/dl, uric acid 12 mg/dl, serum calcium 8.8 mg/dl, serum phosphorus 4.5 mg/dl, serum sodium and potassium were normal. His liver function tests showed serum bilirubin 3.4 mg/dl, SGOT /SGPT 369/313 IU/I, Albumin/Globulin 3.22/2.05 g/dl, alkaline phosphates 221 IU/I. His serum LDH was 867 IU/I, Creatine-phosphokinase (CPK) was 9170 U/I and serum myoglobin was 375 mg/dl. The diagnosis of rhabdomyolysis induced ARF was made, but cause of rhabdomyolysis was not obvious on clinical ground. His viral markers (HBsAg, HCV and HIV) were negative, ANA, ANCA and complement levels were normal. His general blood picture revealed red blood cells loaded with trophozoites of Plasmodium falciparum with normocytic normochromic anaemia. His urine routine and microscopy showed albumin trace and bland sediments. His ultra sound revealed normal size kidney with increased echogenicity and altered cortico-medullary differentiation.

We suspected rhabdomyolysis was related to falciparum malaria in view of fever and hepato-splenomegaly and diagnosis of falciparum malaria was confirmed on positive smear. He was managed with four sessions of hemodialysis and anti malarial drugs. His biochemical profile started improving and his blood urea and serum creatinine declined to 118 mg/dl and 3.62 mg/dl respectively in 10 days time. His CPK and serum Myoglobin declined to 300 U/l and 100 mg/dl respectively at the time of discharge. He recovered completely and on subsequent follow up his renal failure and biochemical profile became normal.

ATN is a common complication of severe falciparum malaria but rhabdomyolysis is a rare cause of ARF in falciparum malaria.3 Severe falciparum malaria with heavy parasitaemia can cause rhabdomyolysis leading to ARF.3 According to Miller et al heavy parasitaemia in falciparum malaria cause sequestration of red blood cells and vascular plugging in skeletal...
muscle and toxin derived from parasite or host and lactic acidosis cause muscle necrosis. High grade fever in malaria cause release of tumour necrosis factor α, which is a known myotoxin. Elevated serum concentration of myoglobin in rhabdomyolysis can causes tubular epithelial damage and promote intratubular cast formation. It also inhibits nitric oxide bioactivity leading to intrarenal vasoconstriction and ischaemia, which causes ATN leading to ARF. There is a series of 12 patients reported from India by Mishra et al with evidence of skeletal muscle injury in severe malaria from Rourkela; Orissa. Miller et al reported a case of Gambian child having evidence of muscle damage. Knochel et al reported a 32 year old man having rhabdomyolysis with renal failure associated with malaria from Nigeria. All the above mentioned cases were having mild renal failure and were managed conservatively with antimalarial drugs. We are here by reporting a case of skeletal muscle injury with severe renal failure requiring dialysis at the time of presentation due to falciparum malaria. Almost one third of patients who have rhabdomyolysis develop ARF. Rhabdomyolysis is usually overlooked in case of falciparum malaria with ARF. High index of suspicion is needed to diagnose rhabdomyolysis in patients of malarial ARF. The presence of severe myalgia with ARF in febrile patients makes us to suspect rhabdomyolysis. In summary, falciparum malaria is one of the infectious causes of rhabdomyolysis and this condition should be suspected in febrile patients with myalgia, hepato-splenomegaly and ARF.

References