Haemolytic-Uraemic Syndrome Complicating Snake Bite

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Dear Sir,

The triad of acute renal failure (ARF), thrombocyto-penia and haemolytic anaemia with fragmented erythrocytes (schistocytes) comprise the haemolytic-uraemic syndrome (HUS) [1]. In addition to its primary idiopathic childhood form, this syndrome can occur secondarily with viral and bacterial infections, oral contraceptive use and in pregnancy and in the puerperium [2]. Its occurrence after snake bite is not well known.

During the period 1975–1983, 12 female and 12 male patients, with a mean age of 36 years (SD 14 years), were treated for ARF following snake bite at the Christian Medical College Hospital at Vellore in southern India. They had been referred for treatment from peripheral clinics 2–21 days after the onset of oliguria. Initially the patients had severe pain and swelling at the site of the bite and bleeding manifestations, most commonly haematuria with prolonged bleeding and clotting times. Oliguria or anuria developed within 24 h of the bite, and lasted for 4–47 days. The snake was identified by description as *Vipera russelli* in 7 cases. In the remainder, identification could not be made, although the symptomatology suggested that the Russell's viper was involved in all cases and this is the only snake in this region whose bite is reported to cause ARF [3].

Results of laboratory investigations were as follows: Blood urea, mean 46.5, SD 25 mmol/L; plasma creatinine, mean 967, SD 417 $\mu\text{mol/L}$; platelet count, mean 104, SD $92 \times 10^9/\text{L}$; packed cell volume, mean 0.27, SD 0.11; reticulocyte count, mean 5, SD 3%; total leukocyte count, mean $13.3 \times 10^9/\text{L}$; differential neutrophil count, mean 80, SD 8%. Schistocytes were present in the peripheral blood smears of 22 patients. Sixteen patients had HUS with anaemia, schistocytosis and thrombocyto-penia. Six patients had normal platelet counts when first examined 7 days or more after the bite, and there was no

record of schistocytes in the peripheral blood smear in 2 cases. Absence of the complete triad could, in most cases, be attributed to incomplete or delayed investigation. Percutaneous renal biopsies performed in 15 patients showed cortical necrosis in 3 cases and acute tubular necrosis in the rest. Fibrin and platelet clusters were demonstrable in glomeruli and small calibre blood vessels in 5 of the 7 biopsies examined electron microscopically [4, 5].

Two patients were treated conservatively, 2 with haemodialysis and the rest by peritoneal dialysis. One patient died of massive haematemesis soon after admission to hospital. Patients with cortical necrosis developed chronic renal failure, the others made a complete recovery.

Schistocytosis, haemolytic anaemia and thrombocytopenia were also present in some of the 45 patients with ARF following snake bite reported from northern India and in some of whom the Russell's viper was implicated [6]. The HUS can also occur following bites by other snakes. These include *Pseudonaja* (*Demansia*) *textilis* *tex-tilis* [7] *Demansia nuchalis* *nuchalis* or *Demansia nuchalis affinis* [8] from Australia, and the South African boomslang, *Dispholidus typus* [9].

Intravascular coagulation is considered to be the cause of ARF in this condition on the basis of ultrastructural findings [4, 5], and because of the known coagulant properties of Russell's viper venom [10]. The resultant vascular obstruction and ischaemia would cause acute renal tubular necrosis or cortical necrosis depending upon its severity. Intravascular coagulation would also result in a consumption coagulopathy with platelet depletion and fibrin strands in small blood vessels, which would fragment erythrocytes, thus producing the triad of HUS.

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