Polyarteritis nodosa and monocytic leukaemia

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Summary: A 67 year old man presented with a polyarteritis nodosa-like syndrome with renal, pulmonary joint and neurological involvement during the 'preleukaemic' stage of monocytic leukaemia. The association between these two conditions is discussed.

Introduction

A polyarteritis nodosa-like syndrome has previously been reported in association with hairy cell leukaemia (Elkon *et al.*, 1979), lymphatic leukaemia (Gerber *et al.*, 1972), lymphoma (Hench *et al.*, 1962) and myeloma (Hallen, 1966). We here report a case of acute monocytic leukaemia presenting with a polyarteritis-like syndrome in the 'preleukaemic' stage of the disease. Renal biopsy showed the histological change of microscopic polyarteritis with segmental necrotizing glomerulonephritis.

Case report

In May 1981, a 67 year old man presented with a one week history of progressive dyspnoea, hoarseness of voice and haemoptysis. He had arthralgia, general malaise, tiredness and weight loss in the past two months. Physical examination showed that he was anaemic and in mild congestive cardiac failure. The liver was palpable 3 cm below the right costal margin. No lymphadenopathy, bruising or splenomegaly was detected. Both ankle jerks were absent and there was symmetrical sensory loss to pin-prick and fine touch in the lower limbs. Initial laboratory investigation showed haemoglobin 5.3 g/dl, white cell count $18.9 \times 10^9/l$ with 48% monocytes, platelet count $190 \times 10^9/l$ and erythrocyte sedimentation rate (ESR) 68 mm/h. The blood film showed marked anisopoikilocytosis and polychromasia, no blast cell was seen. Urine examination showed 1.8 g proteinuria/day and microscopic haematuria with casts. Serum urea and creatinine were raised at 19.5 mmol/l and 455 $\mu\text{mol/l}$ respectively. Liver function tests were normal and hepatitis B surface antigen was not detected. Antinu-

clear antibodies were not detected but rheumatoid factor was strongly positive 1/1024. Complement screen showed slightly diminished C_3 . Chest X-ray showed bilateral basal pulmonary infiltrate. Bronchoscopy and laryngological examination showed a right sided vocal cord paralysis secondary to right recurrent laryngeal nerve palsy. Bone marrow examination on two occasions revealed a markedly hypercellular and dysplastic marrow with 19% myeloblasts consistent with a 'preleukaemic' state. Renal biopsy showed segmental proliferative glomerulonephritis with crescent formation and fibrinoid tuft necrosis (Figure 1). No electron dense deposit was seen under electron-microscopy. Immunofluorescence stain was negative for immunoglobulins or complements but fibrinogen was present in crescent and area of necrosis. Interlobular vessels showed an arteritis with partial luminal occlusion and intense round cell infiltration. A diagnosis of the 'microscopic' form of polyarteritis was made and treatment was commenced with intravenous pulse methylprednisolone, oral prednisolone 40 mg/day and cyclophosphamide 2 mg/kg/

Figure 1 Renal biopsy: $\times 400$. Segmental proliferative glomerulonephritis with crescent formation and tuft necrosis.

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day. He improved rapidly with increased general well-being, resolution of vocal cord paralysis and chest X-ray changes, decreased ESR and fall in serum creatinine to 300 $\mu\text{mol/l}$. His renal function remained stable with no recurrence of vasculitic activity on a maintenance dose of prednisolone 15 mg/day until 1 year later when he suddenly presented with pyrexia, hypotension and shock. He died within 48 hours after hospital admission despite intensive antibiotic treatment. Peripheral blood film and bone marrow examination showed that he had developed frank acute monocytic leukaemia with blast transformation (Figure 2). Post-mortem examination was not performed.

Discussion

The pathogenesis of polyarteritis nodosa remains unclear though various factors like drug hypersensitivity, atopy, autoallergy and infections have been previously suggested (Hughes, 1977). An immune-complex mechanism has been proposed because of the demonstration of circulating immune complexes in some cases and immunoglobulin and complement deposition in glomeruli and vessel walls in cases of polyarteritis associated with hepatitis B surface antigenaemia (Ronco *et al.*, 1984; Michalak, 1978). Gerber *et al.* (1972) reported a patient with a combination of polyarteritis nodosa, Australia antigenaemia and lymphatic leukaemia. Recently, a high prevalence of polyarteritis was reported in patients with hairy cell leukaemia in the absence of circulating hepatitis surface antigen (Elkon *et al.*, 1979; Goedert *et al.*, 1981).

Elkon *et al.* (1979) suggested that in patients with hairy cell leukaemia, heavy or persistent antigen exposure, e.g., tumour associated antigen and infection in the presence of impaired reticuloendothelial clearance, predisposes to immune complex vasculitis. However, in previously reported cases of polyarteritis associated with leukaemia, the vasculitic syndrome usually developed after chemotherapy or splenectomy

Figure 2 Peripheral blood smear: $\times 1800$. Monocytoic leukaemia showing an aggregate of 6 immature monocytoytic cells and one normoblast.

(Elkon *et al.*, 1979; Gerber *et al.*, 1972). Goedert *et al.* (1980) thought that the two diseases may share a common pathogenesis or predisposing factor. The monocyte macrophage system has a central role in immune complex clearance and interference of its function could result in prolonged circulation and deposition of immune complex (Elkon *et al.*, 1979). Saturation of the reticuloendothelial system with soluble immune complexes can provoke deposition in vessel wall and subsequent vascular damage (Haakenstad & Mannik, 1974). Our patient developed polyarteritis with renal, pulmonary, joint and neurological involvement in the absence of obvious infection, the hepatitis B or cytomegalo-virus and drug allergy. The diagnosis was supported by the histological change in the renal biopsy (Williams, 1979). Though we have not performed immune complex clearance studies in our patient, it is reasonable to speculate that the preleukaemic state predisposed him to develop the vasculitic syndrome. A case of acute myeloblastic leukaemia associated with polyarteritis has been reported before (Molly *et al.*, 1981). To our knowledge, this is the first case of polyarteritis developing in the 'preleukaemic' stage of monocytic leukaemia.

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