Synovial Amyloidosis of β_2 -Microglobulin Type in Patients Undergoing Long-Term Hemodialysis

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Dear Sir,

Several authors have described an increased incidence of carpal tunnel syndrome (CTS) in patients on regular hemodialysis therapy (RHT) [1–3]. Amyloid deposition in the carpal tunnel synovium and tendons in RHT patients without primary or secondary amyloidosis has been described by several investigators [2–4]. Shoulder pain and stiffness [3] or scapulohumeral periarthritis (SHP) [4] and CTS are common in very long-term hemodialysis patients. 11 out of 13 patients operated for CTS with amyloid deposits has SHP [2].

We had the opportunity to conduct histologic studies of SHP in 2 patients who had been receiving maintenance hemodialysis for 13 and 11 years, respectively. The occurrence of renal failure in the patients was not related to amyloidosis (1 patient had renal tuberculosis, the other chronic glomerulonephritis).

These 2 patients had severe pain in their shoulders, trigger finger and bilateral CTS.

Histomorphometric analysis performed on bone biopsy samples of the iliac crest [5] from both patients demonstrated changes due to aluminum and iron osteomalacia [6] in one patient, mild osteitis fibrosa in the other.

An excisional biopsy of the shoulder soft tissue was performed. Surgical exploration showed that the swelling and thickening of their subacromial bursa, yellowish brown granular deposits, rupture of the biceps tendon and incomplete rupture of the supraspinatus tendon. The bursal lumen contained a massive bloody fluid.

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Fig. 1. Section of the subacromial bursa from a patient with synovial amyloidosis stained with Congo red and hematoxylin. Congophilic substance is deposited in the interstitium (a). Immunofluorescent preparation reacted with antihuman β_2 -microglobulin antiserum (b).

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Amyloid predominantly involving the interstitium of the synovium, tendon sheath and ruptured tendon by characteristic staining on polarizing microscopy was demonstrated and confirmed by electron microscopy. Using Wright's technique, potassium permanganate treatment eliminated Congo red stainability. By immunofluorescence, the sections did not stain with anti-AL, AA and prealbumin antisera. In contrast, strong and bright staining was observed in the amyloid area when using an anti- β_2 -microglobulin antiserum (fig. 1). In the specimens of the tendon and synovial tendon sheaths operated for CTS, the same result was observed by immunofluorescence.

These findings demonstrate that hemodialysis-associated synovial amyloidosis is related to β_2 -microglobulin [7]. Thus, effective medical treatment for amyloidosis to be aimed at reducing its circulating concentration is considered.

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