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Glomerular Calcinosis in Sarcoidosis

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• Glomerular lesions secondary to calcium deposition in sarcoidosis have not been previously described, to our knowledge. Five renal biopsy specimens from four patients with sarcoidosis were studied by light, electron, and immunofluorescence microscopy. In addition to interstitial granulomatous nephritis and nephrocalcinosis, which were seen in all cases, segmental glomerular lesions characterized by marked thickening and wrinkling of the glomerular capillary walls and basophilic appearance of the altered basement membranes were present in three of the cases. Electron microscopic examination of the lesions revealed dramatic alteration of the glomerular ultrastructure. Numerous single and coalescent calcific microspherules were present within the basement membrane, the paramesangial zone, and the mesangium. The findings of immunofluorescence were noncontributory. The structural alterations caused by calcinosis of the glomerulus may be responsible for some of the frequent renal function abnormalities seen in sarcoidosis.
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Impaired renal function is not an infrequent clinical presentation in patients with sarcoidosis. Although in the majority of cases the renal dysfunction is related to nephrocalcinosis and/or nephrolithiasis,[1-8] in some cases it is attributed to direct infiltration of the renal parenchyma by granulomatous interstitial nephritis[9-21] or to a variety of glomerular lesions.[22-25]

The types of glomerulopathies so far reported in association with sarcoidosis are membranous,[23,26-31] proliferative,[9,23,27,32,33] crescentic,[29,34,35] focal segmental sclerosis,[36] and IgA nephropathy.[37,38] Of these, membranous seems to be the most frequent.[30] Although a common immunologic pathogenesis has been suspected,[36] a causal relationship between sarcoidosis and glomerular lesions has not been established. To our knowledge, glomerular lesions directly ascribed to deranged calcium metabolism in sarcoidosis have not been reported to date.

We studied five renal biopsy specimens from four patients who were admitted to the Victoria General Hospital, Halifax, Nova Scotia, between 1983 and 1990 because of acute renal failure and who were diagnosed as having sarcoidosis (salient features are summarized in the Table). Three of the cases showed glomerular calcinosis.

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REPORT OF CASES

Case 1.—A 69-year-old woman was found to have hypercalcemia and renal insufficiency on routine investigation for chronic colonic polyp disease in October 1982. Investigations revealed an elevated serum midmolecule parathyroid hormone level, and the patient underwent a parathyroidectomy. The parathyroid glands were reported to be normal, and the hypercalcemia did not resolve following surgery. By September 1983, the patient's serum calcium level was up to 3.18 mmol/L (reference range, 2.19 to 2.54 mmol/L), and her serum creatinine level was 422 μmol/L (reference range, 60 to 120 μmol/L). Physical examination revealed bibasilar pulmonary rales and a midsystolic murmur. She had a diffuse, erythematous, fine maculopapular eruption over her arms and the upper part of her torso. Further investigations revealed an increased serum IgG level (16.1 g/L) and a reduced diffusion capacity on pulmonary function studies. A renal biopsy was performed, and the diagnosis of sarcoidosis was established. The patient was treated with prednisone and has remained well. In August 1990, her serum calcium level was 2.32 mmol/L and her serum creatinine level was 146 μmol/L.

Case 2.—A 33-year-old woman with inflammatory bowel disease presented with a 1-month history of fatigue, nausea, vomiting, and headache. Physical examination revealed a blood pressure reading of 140/90 mm Hg and normal intravascular volume. The results of the respiratory, cardiovascular, abdominal, neurologic, and musculoskeletal examinations were all normal.

Investigations revealed a normal chest roentgenogram, normocytic normochromic anemia, an erthrocyte sedimentation rate of 54 mm/h, a negative antinuclear antibody test, normal complement levels, a serum creatinine level of 472 μmol/L, a serum urea nitrogen level of 19.1 mmol/L, and a serum calcium level of 2.53 mmol/L. The alkaline phosphatase level was elevated to 242 U/L (reference range, 30 to 104 U/L); the alanine aminotransferase level, to 67 U/L (reference range, 1 to 41 U/L); and the aspartate aminotransferase level, to 50 U/L (reference range, 8 to 29 U/L). Liver and kidney biopsy specimens were obtained and showed granulomatous inflammation. A diagnosis of sarcoidosis was highly suspected. Prednisone therapy was started, with improvement. By February 1986, the patient's serum creatinine level was 190 μmol/L. She discontinued the prednisone therapy on her own because of side effects. She presented in August 1986 with her original complaints. Her serum creatinine level was 1207 μmol/L and her IgG level was 20.2 g/L. A second kidney biopsy was performed and the diagnosis of sarcoidosis was confirmed. Prednisone therapy was restarted, and the patient gradually improved. In April 1990, her serum calcium was level 2.27 mmol/L and her serum creatinine level was 193 μmol/L.