Case Report

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Renal Amyloidosis Due to Juvenile Rheumatoid Arthritis Occurring in Early Childhood

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Renal amyloidosis is a late manifestation of chronic juvenile rheumatoid arthritis (JRA) and usually manifests during the first 10 to 15 years after the onset of JRA. We hereby report a boy with JRA-related renal amyloidosis who presented with nephrotic syndrome in early childhood. Amyloidosis was associated with a 6-year history of juvenile rheumatic arthritis (JRA).
Diagnosis of renal amyloidosis was confirmed by the deposition of Congo red positive amyloid fibrils within the glomeruli. Polarized light microscopy showed the classic green birefringence appearance.

Key words: Arthritis, Juvenile; Amyloidosis, familial renal; Child.

Running Title: Renal Amyloidosis in Juvenile Rheumatoid Arthritis

Introduction

Amyloidosis is a group of disorders in which soluble proteins accumulate and deposit in tissues as insoluble fibrils. The insoluble fibrils, which are also known as amyloid, cause progressive organ dysfunction [1,2]. The kidney is one of the most common organs of amyloid deposition. The renal involvement is usually related to monoclonal kappa/lambda immunoglobulin light chain-type (AL) or AA amyloidosis [1,2]. A kidney biopsy is necessary to reveal the presence of amyloid protein to positively diagnose amyloidosis [3-5].

Renal amyloidosis is a late manifestation of chronic juvenile rheumatoid arthritis (JRA), and should be considered in the list of differential diagnoses of adult patients with nephrotic syndrome. The JRA-related renal amyloidosis presenting as nephrotic syndrome in early childhood is extremely rare. We report a case of nephrotic syndrome due to renal amyloidosis in a 7-year-old boy with a history of JRA at one year of age.

Case Report

A 7-year-old boy was referred to the Pediatric Nephrology Clinic of Dr. Sheikh Hospital, Mashhad University of Medical Sciences, because of generalized edema and hypertension over the last 4 weeks. He was in his usual state of health until one year of age when he developed joint pain involving his ankle and knee for which he did not seek any medical care. The family history was unremarkable. Examinations, at the renal clinic, revealed an edematous child with no apparent respiratory distress syndrome. His blood pressure was elevated at 130/90 mmHg (>95th percentile). There were severe arthritis and bone deformities involving large and small joints of his hands and feet. The remaining of the examination was unremarkable. Skeletal radiography showed findings consistent with JRA. Laboratory work-up showed normal serum creatinine and BUN levels and negative rheumatoid factor. A diagnosis of nephrotic syndrome was confirmed with a serum albumin level of 2 mg/dL and a urine protein-to-creatinine ratio of 4/1. He had a normal complete blood count as well as normal hemoglobin, hematocrit, serum BUN, and creatinine levels. The erythrocyte sedimentation rate (ESR) was 95 mm/h. Serum complement levels were normal. The antinuclear antibody (ANA) was negative. Renal ultrasound was unremarkable. A renal biopsy revealed deposition of Congo red positive fibrils within the glomeruli. The polarized light microscopy demonstrated the classic apple-green birefringence (Fig 1). The patient's blood pressure was controlled with an angiotensin-converting enzyme (ACE) inhibitor and a calcium channel blocker.

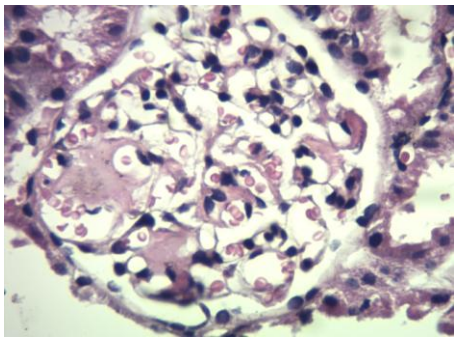

Fig 1 a

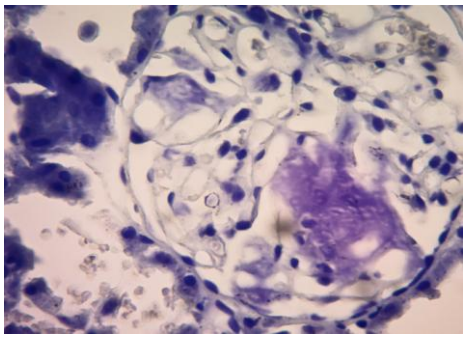

Fig 1 b

Fig 1. The polarized light microscopy of kidney pathology

Discussion

This report illustrates a rare case of JRA-related renal amyloidosis occurring in the early childhood [2]. The patient presented with nephrotic syndrome without any nephritic features. He also had significant arthritis and joint deformities involving both knees and ankles.

A renal biopsy revealed deposition of eosinophilic amorphous in the mesangeal matrix of the glomeruli with hematoxylin-eosin staining and a characteristic orange-red staining with Congo red and apple-green birefringence under polarized light, diagnostic for amyloid deposition. Renal amyloidosis occurs rarely in children and is often secondary to auto-inflammatory disorders such as JRA and FMD, lupus, inflammatory bowel disease, and tuberculosis [6-9].

Renal involvement is due to deposition of amyloid A protein (AA) in the kidney that stains orange-red with Congo red staining and shows apple-green birefringence under polarized light [3,4]. Renal manifestation occurs in a variety of forms including isolated hematuria, nephrotic syndrome, and renal impairment, with nephritic features. Management of secondary amyloidosis involves treatment of the underlying cause. Nephrotic syndrome is unresponsive to corticosteroids [10]. Angiotensin-converting enzyme (ACE) inhibitors and angiotensin II receptor blockers are used in patients with proteinuria. Corticosteroids and immunosuppressive drugs are useful if the patient develops vasculitis. Colchicine has been used as the drug of choice for patients with familial Mediterranean fever (FMF) [11-13]. However, many patients with renal impairment and some with nephrotic syndrome will progress to end-stage renal disease in spite of treating the underline pro-inflammatory disease [14, 15]. In summary, it is important to be aware of renal amyloidosis in young children in the context of early onset JRA. Early diagnosis is essential to prevent chronic kidney disease.

Conflict of Interest
None declared

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None declared

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