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Kidney involvement in ankylosing spondylitis; recent findings

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Abstract

Ankylosing spondylitis is a chronic inflammatory illness that initially involves the spine and sacroiliac joint. It rarely presents with kidney disease. Various biochemical and morphological alterations have been described, consisting of hematuria, proteinuria, and low GFR across immunoglobulin A nephropathy, renal amyloidosis, focal segmental glomerulosclerosis, and chronic interstitial nephritis with different frequencies among populations.

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Introduction

Ankylosing spondylitis is a popular presentation of axial spondylarthritis, defined by inflammatory low back pain, excess spinal bone formation, radiographic sacroiliitis, and a raised frequency of HLA-B27 (1). Ankylosing spondylitis has a male preponderance with a peak in middle age. Progressive spinal rigidity and inflammatory back pain are the main characteristic features of this disease, leading to spine fusion and patient immobility (2). This disease primarily involves spinal and sacroiliac joints; however, patients may also face peripheral arthritis and extra-articular symptoms, like acute anterior uveitis, psoriasis, and inflammatory bowel disease, along with the involvement of several organ systems like the pulmonary, neurologic, cardiovascular, and kidneys. In this condition, renal complications frequently arise as part of its extra-articular symptoms, as there is an increased risk to kidney disorders compared to the general population (3). However, renal disease may be one of the neglected risk factors as few renal biopsies have been conducted following this disease. In a previous study, Azevedo et al assessed 76 spondyloarthritis cases. The most frequently detected abnormality in their patients was microscopic hematuria. Meanwhile, in kidney biopsies conducted on a few patients, IgA nephropathy was the most common kidney pathology (4). In another study, Lee et al assessed 681 ankylosing spondylitis patients. They found that 7.1% of patients had renal diseases such as IgA nephropathy, focal segmental glomerulosclerosis, and amyloidosis. They also reported that the prevalence of renal disease was higher in patients with longer disease duration and higher C-reactive protein levels. In this study, they co-conducted kidney biopsies in six out of 681 patients, which mostly showed IgA nephropathy and amyloidosis (5). This study also revealed that out of 681 patients, eight percent of participants had abnormal urinalysis findings consisting of proteinuria (5.9%) and hematuria (2.8%). They further demonstrated that serum uric acid and IgA levels may predict renal involvement in ankylosing spondylitis. As a result, the study by Strobel et al showed that secondary

Key point

In ankylosing spondylitis, hematuria, proteinuria, and renal failure alongside immunoglobulin A-associated nephropathy, kidney amyloidosis, focal segmental glomerulosclerosis, and chronic interstitial nephritis are the most frequent findings in different studies among populations.

kidney amyloidosis was the most frequent kidney disease, followed by immunoglobulin A nephropathy and mesangioproliferative glomerulonephritis along with some cases of membranous nephropathy and focal segmental glomerulosclerosis. Moreover, they noted the treatment-related nephrotoxicity due to the non-steroidal anti-inflammatory agents or disease-modifying drugs also as a responsible parameter for kidney failure in these patients (3). Furthermore, a previous retrospective study by Ben Taarit et al on 28 individuals with kidney involvement in 210 patients with ankylosing spondylitis showed that 28 out of 210 cases had one or more signs of kidney involvement. These signs included decreased kidney function, macroscopic hematuria, microscopic hematuria, and nephrotic syndrome. They also showed that kidney amyloidosis and nephrolithiasis were the most frequent causes of kidney involvement across immunoglobulin A nephropathy in three (6). Recently, Ye et al investigated 616 ankylosing spondylitis patients in Peking, which 25% of patients had chronic kidney disease (CKD). This study demonstrated that the male gender with CKD had more frequent proteinuria and a lower estimated glomerular filtration rate than the female gender. They also detected that CKD was independently correlated with hyperuricemia and elevated serum cholesterol levels in female subjects. This study also showed that CKD was independently associated with hyperuricemia, high blood pressure, and serum albumin in the male gender. Finally, they concluded that CKD is a common comorbidity in individuals with ankylosing spondylitis since males are more prone to present severe manifestations of ankylosing spondylitis than females. Likewise, hyperuricemia was noted as a potent independent risk factor for CKD in both genders since high blood pressure and low-serum albumin were the risk factors of CKD only in the male group (7). More recently, Rodrigues et al (8) investigated 15 Caucasian ankylosing spondylitis cases from October 1985 to March 2021. Their patients were mainly male, with a median age of 47 years. Median plasma creatinine concentration at presentation was 1.3 mg/dL, while most cases had proteinuria or hematuria. They noted that the main indication for renal biopsy was nephrotic syndrome, followed by rapidly progressive renal failure and chronic renal failure. A renal biopsy revealed primarily chronic interstitial nephritis and AA amyloidosis. Meanwhile, IgA-associated nephropathy, focal segmental glomerulosclerosis, membranous nephropathy, and immune complex-mediated membranoproliferative glomerulonephritis were also observed following kidney biopsy. Their study found a lower frequency of immunoglobulin A nephropathy than in the earlier case reports or cohorts in Asian studies. Interestingly, they observed a higher frequency of chronic interstitial nephritis and a lesser frequency of AA amyloidosis than other studies (8). Overall, their study highlighted the differences in the prevalence of renal diseases among different populations.

Conclusion

In summary, renal disease is an infrequent personation of ankylosing spondylitis, and its renal morphological changes remain ill-understood. From a para-clinical point of view, hematuria, proteinuria, and low GFR were the most frequent findings. Studies regarding morphological alteration in renal biopsy have shown immunoglobulin A nephropathy, renal amyloidosis, and focal segmental glomerulosclerosis across chronic interstitial nephritis. These conditions are found with different frequencies among populations. This letter highlights the strong impact of this disease on renal function and structure. This requires further attention during ankylosing spondylitis management.

Authors' contribution

Conceptualization: Hamid Nasri, Sasan Zandi Esfahan, Sara Moslehi.
Data curation: Sasan Zandi Esfahan.
Investigation: Hamid Nasri.
Resources: Sara Moslehi, Sasan Zandi Esfahan.
Supervision: Hamid Nasri.
Validation: Hamid Nasri.
Visualization: Hamid Nasri
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Writing–review and editing: Nabiha Midhat Ansari.

Conflicts of interest

The authors declare that they have no competing interests.

Ethical issues

Ethical issues (including plagiarism, data fabrication, and double publication) have been completely observed by the authors.

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