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Long-term outcome of pediatric nutcracker syndrome: a single-center retrospective study

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Objectives: The Nutcracker syndrome refers to the compression of the left renal vein resulting in a variety of clinical manifestations such as venous hypertension, hematuria, orthostatic proteinuria, and varicocele. Its prevalence and long-term results, especially in pediatric patients are still not well known. This study aimed to investigate its long-term outcome so can help the diagnosis and predict the prognosis of Nutcracker syndrome.

Methods: This retrospective study included pediatric patients diagnosed with nutcracker syndrome from 1997 to 2021 in Seoul National Children's hospital. We reviewed medical records and clinical manifestations, laboratory findings and imaging results were collected and analyzed.

Results: 123 children (55 males and 68 females) diagnosed with nutcracker syndrome were included in this study and the patients were followed up for mean period of 7.42 years (range 0.21-21.94 years). The mean age was 10.08 years (boys 11.2 years, girls 9.2 years). Microscopic hematuria was the most common presentation (62.6%), followed by gross hematuria (29.3%) and orthostatic proteinuria (17.1%). Renal biopsy was done in the 5 patients, and 2 of them revealed IgA nephropathy and others revealed membranous glomerulonephritis, alport syndrome, and focal segmental glomerulosclerosis respectively. The level of hematuria has improved ($p < 0.01$) with the course of time. 22 patients (17.8%) maintained hematuria and 7 patients (5.7%) maintained proteinuria.

Conclusions: Hematuria is the most frequent symptom in pediatric patients diagnosed with NCS and turned out to be improved in the course of time. Further long term follow-up and observation is needed to get more sufficient results about its clinical evolution and prognosis.