

# POST-STREPTOCOCCAL GLOMERULONEPHRITIS

## AUTHORS

Odalovic A., Katanic N., Milic A., Arsović A  
 Medical faculty, University of Pristina, Kosovska Mitrovica

## SUMMARY

Post-streptococcal glomerulonephritis (PSGN) is a frequent cause of acute nephritis in children. This case study was done with the aim to point out that the infections caused by Group A streptococci, in spite of antibiotic era, are still present in the population. An 8-year old boy was admitted in our hospital with a two-day history of fever, tonsillopharyngitis. After hospital admission, patient was treated with penicillin during the period of 10 days, antihypertensive medications (captopril, furosemide), including restricted diet of salt. After the treatment, patient became better. On demission it was found proteinuria and microhematuria. PSGN is very serious disease, which leaves severe complications if the valid therapy with penicillin is not used in propriety time, during the recommended period of 10 days.

**Keywords:** glomerulonephritis, streptococcal infections.

## INTRODUCTION

Post-streptococcal glomerulonephritis (PSGN) is a frequent cause of acute nephritis in children. This case study was done with the aim to point out that the infections caused by Group A streptococci, in spite of antibiotic era, are still present in the population.

## CASE REPORT

An 8-year old boy was admitted in our hospital with a two-day history of fever, tonsillopharyngitis, and stomach ache associated with vomiting, periorbital edema and body edema. A boy was hospitalized for 10 days. Biochemical and clinical parameters were observed. The boy was 41kg weight, 142cm high, dispoic, euhydric, with expressed edema and blood pressure 175/120 mmHg. After the hematologic analyses the next values of measured parameters were recorded: erythrocytes  $3.1 \times 10^{12}/L$ , hemoglobin 94 g/L, hematocrit 0.31 L/L, leukocytes  $12.4 \times 10^9/L$ , (neutrophils  $0.58 \times 10^9/L$ , lymphocytes  $0.36 \times 10^9/L$ , monocytes  $0.06 \times 10^9/L$ ). The values of urea were 3.2, 2.9, and 3.1 mmol/L in the first, fifth and tenth day, respectively. The values of creatinine were 41, 69, and 48  $\mu\text{mol}/L$  in the first, fifth, tenth day, respectively; clearance was 85 mmol/L; albumin was 29 and 30 g/dL in the first and tenth day, respectively;  $\text{Na}^+$  150 mmol/L,  $\text{K}^+$  4.8 mmol/L, alkaline phosphatase 519-476 U/L, antistreptolysine O test 600 U/mL, C reactive protein <6, and <24 mg/L in first and tenth day, respectively; IgG 137 mg/dL, and IgM 1 mg/dL.

After the urine analysis, the values of erythrocytes were 15-20 per HPF, and the values of leukocyets were 2-3 HPF.

ECHO of abdomen: left kidney without changes, right kidney in diameter 78x40mm. Diuresis was 700ml per 24h.

The values of biochemical and clinical parameters recorded at the admission indicated that the patient developed PSGN.

After hospital admission, patient was treated with penicillin during the period of 10 days, antihypertensive medications (captopril, furosemide), including restricted diet of salt. After the treatment, patient became better.

On demission it was found proteinuria and microhematuria.

## DISCUSION

*S. pyogenes* is a gram-positive, exclusively human pathogen causing common throat and skin infections but also severe invasive disease and the nonsuppuraive complications acute rheumatic fever and poststreptococcal glomerulonephritis. In particular, the spectrum of acute invasive disease includes erysipelas, cellulitis, endometritis, pneumonia, septicemia, meningitis, and the severe manifestations necrotizing fasciitis, and streptococcal toxic shock syndrome [1,2,3,4].

Post-streptococcal acute glomerulonephritis is one of the most important and intriguing conditions in the pediatric nephrology. Although the eventual outcome is excellent in most cases, PSAGN remains an important cause of acute renal failure and hospitalization for children in both developed and underdeveloped areas [5].

Post-streptococcal acute glomerulonephritis remains an important non suppurative complication of group A streptococcal infection worldwide. The estimated worldwide yearly burden of PSAGN is 472,000 cases; approximately 404,000 of those occur in children [6].

Most of the well-studied PSAGN epidemics or clusters were pyoderma-associated. However, a few epidemics/clusters included a predominance of pharyngitis-associated strains. In geographical areas having distinct seasons, pyoderma-associated cases tend to occur in the late summer or early fall months, while in regions with a constant tropical climate cases occur year round [7].

The median age of presentation for PSAGN in childhood is between 6 and 8 years old. Children with PSAGN most often seek medical attention for edema or gross hematuria; occasionally symptoms or signs of hypertension will be the initial presenting feature leading to the diagnosis. The triad of edema, hematuria and hypertension is classic for PSAGN [8].

With the exception of rare cases with atypical presentation, hematuria is present in essentially all patients. The classic description of tea or cola-colored urine occurs in approximately 25-60% of cases [9]. Proteinuria is also typically present. Hypertension occurs in approximately 80-90% of cases. Cerebral complications of hypertension including headaches, seizures, mental status changes, and visual changes occur in 30-35% of children.

Renin levels (plasma rennin activity) are typically low at presentation. Fluid retention correlates with suppression of the plasma renin activity. Diastolic blood pressure significantly correlates with the degree of fluid overload as assessed by weight change pre- and post-spontaneous diuresis [10,11].

The serological markers most commonly used by the clinician are anti-streptolysin O (ASO) titer and depression of serum C3 level. Increased antibody levels to antistreptococcal antigens (ASO, anti-hyaluronidase and anti-DNAase) are documented less often than low levels of C3. ASO titers are higher in pharyngitis-associated PSAGN than pyoderma-associated PSAGN [12,13,14].

---

## CONCLUSION

PSGN is a very serious disease, which leaves severe complications if the valid therapy with penicillin is not used in a timely manner, during the recommended period of 10 days.

---

## REFERENCES

1. Murray P.R., Rosenthal K.S.; et al. *Streptococcus*. In: *Medical Microbiology* (225-233), 6th edition, Dep. of Laboratory Medicine, National Institutes of Health, Bethesda Maryland 2009.
2. Cole J. N., Ramirez R.D., Currie B.J., Cordwell S.J., Đorđević S.P.; Surface analyses and immune reactivities of major cell wall-associated proteins of group A *Streptococcus*. *School of Biological Sciences, University of Wollongong, Australia*. 73(5): 3137-46, 2005.
3. Gillos I., Hien J., Tran-Winkler.; Induction of group A *Streptococcus* virulence by human antimicrobial peptide. *The Rockefeller University, New York*. 16755-16760, 2008.
4. Kahn F., Morgelin M., Shannon O.; Antibodies against a surface protein of *Streptococcus pyogenes* promote a pathological inflammatory response. *Dep. of Clinical Sciences, Lund, University BMC, B14, Lund, Sweden*. 10.1371; 1000149, 2008.
5. Steer A. C., Danchin M. H.; Group A streptococcal infections in children. *Centre for International Child Health, University of Melbourne, Dep. of Pediatrics, Melbourne, Victoria, Australia*. 43(4): 203-13, 2007.
6. Kim Sujoo, Nam Yong Lee; Asymptomatic Infection by *Streptococcus pyogenes* in Schoolchildren and Diagnostic Usefulness of Antideoxyribonuclease B. *Dep. of Laboratory Medicine Gyeongsang National University School of Medicine, Jinju, Dep. of Laboratory Medicine, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, Korea*, 20: 938-40, Issn. 1011-8934, 2005.
7. Factor S.H., Levin O.S., Farley M.M.; Risk factors for pediatric invasive A streptococcal diseases. *Disease Control and Prevention, Atlanta, Georgia, USA*. 11(7): 1949-6, 2005.
8. Kosina P., Plisek S., Dostal V.; Invasive streptococcal infections. *Division of Infective Diseases, Hardici Kralove, Czech Republic*. 13(6): 220-4, 2007.
9. Dubrous P., Avarques P., Gardet V.; Invasive infections by *Streptococcus pyogenes*. *Service de biologie, Ann Biol Clin Paris, France*. 63(1): 101-5, 2005.
10. Cunningham M.W.; Pathogenesis of group A streptococcal infections and their sequelae. *University of Oklahoma Health Sciences Center, Oklahoma City, OK 73104, USA*, 609: 29-42, 2008.
11. Erdem G., Sinclair S., Marrone J.R.; Higher rates of streptococcal colonization among children in the Pacific Rim Region correlates with higher rates of group A streptococcal disease and sequelae. *Dep. of Pediatrics, University of Hawaii at Manoa, Clinical Research Center, University of Hawaii, Honolulu, HI, USA, Tropical Medical Center, Pago Pago, American Samoa*. 16: pp 452-455, 2009.
12. Blyth C.C., Robertson W.P., Rosenberg R.A.; Post-streptococcal glomerulonephritis in Sydney: A 16-year retrospective review. *Dep. of Immunology Diseases, Sydney, Australia*. 43(2007), pp446-450, 2007.
13. Ilyas M., Tolaymat A.; Changing epidemiology of acute post-streptococcal glomerulonephritis in Northeast Florida: a comparative study. *Pediatric Nephrology, University of Florida/Jacksonville, Jacksonville, FL, USA* 23: pp 1101-1106, 2008.
14. Hahn R.G., Knoy L.M., Forman T.A.; Evaluation of poststreptococcal illness. *Dep. of Family Medicine, University of Southern California, Los Angeles, California, USA*. 7(10): 1949-54, 2005.

## SRPSKI

## POST-STREPTOKOKNI GLOMERULONEFRITIS

Odalovic A., Katanic N., Milic A., Arsović A

Medicinski fakultet, Univerzitet u Prištini, Kosovska Mitrovica

## SAŽETAK

Poststreptokokni glomerulonefritis je čest uzrok akutnog nefritisa kod dece. Ovaj prikaz slučaja ima za cilj da ukaže da su infekcije izazvane streptokokom grupe A uprkos razvijenoj primeni antibiotika i dalje prisutni u populaciji. Prikaz obradjuje osmogodišnjeg dečaka koji je primljen u našu bolnicu sa tonsilofaringitisom, bolom u stomaku, povraćanjem, periorbitalnim edemom. Tokom bolničkog lečenja pacijent je tretiran penicilinom tokom 10 dana, antihipertenzivnim lekovima i restrikcijom unosa soli. Posle tretmana opšte stanje pacijenta se popravlja, na otpustu je evidentirana proteinurija i mikrohematurija. Poststreptokokni glomerulonefritis je ozbiljna komplikacija ukoliko se adekvatno ne primeni penicilinska terapija tokom preporučenog terapijskog perioda u trajanju od 10 dana.

**Ključne reči:** glomerulonefritis, streptokokne infekcije.

---