www.nephropathol.com DOI: 10.15171/jnp.2017.43 J Nephropathol. 2017;6(4):270-271

Journal of Nephropathology

Predictive value of serum creatinine in patients with posterior urethral valve

Azar Nickavar[1*], Baranak Safaeian[2]

[1]Department of Pediatric Nephrology, Iran University of Medical Sciences, Tehran, Iran
[2]Department of Pediatric Nephrology, Gorgan University of Medical Sciences, Gorgan, Iran

ARTICLE INFO

Article type:
Editorial

Article history:
Received: 18 February 2017
Accepted: 20 April 2017
Published online: 5 May 2017
DOI: 10.15171/jnp.2017.43

Keywords:
Posterior urethral valve
Creatinine
End-stage renal disease
Chronic kidney disease

Implication for health policy/practice/research/medical education:
Posterior urethral valve (PUV) is an important cause of chronic kidney disease in male children. Identification the prognostic factors is necessary for preservation of optimal renal function. Serum creatinine is one the most important predictive factors of final renal outcome in these patients, which is discussed in this paper.

Please cite this paper as: Nickavar A, Safaeian B. Predictive value of serum creatinine in patients with posterior urethral valve. 2017;6(4):270-271. DOI: 10.15171/jnp.2017.43.

Editorial

Posterior urethral valve (PUV) is the most common cause of bladder outlet obstruction and congenital obstructive uropathy in infancy, that impairs renal and bladder function (1,2). Long term prognosis differs from normal kidney function to early onset chronic kidney disease (3).

In spite of improvements in diagnosis and management of PUV, about 20%-60% of patients develop chronic kidney disease (CKD) and 11%-50% end-stage renal disease (ESRD), respectively (4). Therefore, recognition the predictive factors of long term renal function is necessary to identify the most appropriate preventive and therapeutic management. Serum creatinine (sCr) is an important independent risk factor for poor renal function in patients with PUV. Determination of sCr values at presentation, nadir sCr, sCr during the first year of life, and sCr after urinary decompression is helpful to facilitate early prediction and management approaches in these patients (5-7), which is discussed as follows:

(*a*) sCr at presentation; is a valuable prognostic factor of final renal outcome in patients with PUV (3,8). Increased initial sCr with a cutoff value of 1 mg/dL along with decreased initial Cr clearance at hospital admission significantly increase the incidence of renal insufficiency (3). It has been suggested that progression to renal insufficiency is higher in patients with initial increased sCr (62.5%), compared to those with plateau (40%) or decreasing Cr (8.6%) (9).

(*b*) Nadir serum Cr (lowest Cr during the first year of diagnosis) is an independent predictor of renal function in children with PUV (1,10). The most commonly used cut-off being 1 mg/dL, with 100% specificity and 34.5% sensitivity (10). Values more than 1mg/dl during infancy predicts unfavorable renal outcome and higher incidence of ESRD (4). Patients with a normal nadir serum creatinine and early presentation have a better renal outcome (11). Meanwhile, those with nadir creatinine ≤0.4 mg/dL are at low (5.3%) risk, and those between these two values have an intermediate risk (28.3%) (10).

(*c*) One of the most significant prognostic factor of long-term renal function is the value of GFR at 1 year old (10). Decreased or absent renal function reserve in the first year of life consider as an early marker of long-term renal deterioration. It has been suggested that the lowest sCr ≤ 0.8 mg/dL by 12 months is one of the most appropriate predictors of future renal function, higher than sCr at diagnosis (4,12). Patients with sCr > 1.2 mg/dL before the first year of life have

*Corresponding author: Azar Nickavar, Email: anickavar@yahoo.com

more rapid progression to ESRD than those attaining this level later (7).

(*d*) sCr after valve ablation has a high prognostic value for prediction of final renal outcome (5). sCr values after urinary catheterization was higher in males who developed decreased renal function than those who did not (7). Creatinine velocity as the rate of sCr following initial bladder drainage is a recently introduced predictor of CKD in neonates with PUV (13).

There are conflicting evidence about the prognostic value of sCr before and after bladder catheterization. Some suggested more accurate prognostic value of sCr at 1 year after decompression than the initial values (14). However, sCr before bladder catheterization was significatly associated with ESRD, rather than after bladder decompression in our study (3).

In conclusion, monitoring of sCr is recommended to identify progressive renal damage, and provide strategies to preserve residual renal function in patients with abnormal high sCr level.

Authors' contribution

AN is the corresponding author and BS is the coauthor of the manuscript.

Conflicts of interest

The authors declared no competing interest.

Funding/Support

None.

References

1. Bilgutay AN, Roth DR, Gonzales ET Jr, Janzen N, Zhang W, Koh CJ, Gargollo P, Seth A. Posterior urethral valves: Risk factors for progression to renal failure. J Pediatr Urol. 2016;12(3):179.e1-7. doi: 10.1016/j.jpurol.2015.10.009.
2. Caione P, Nappo SG. Posterior urethral valves: long-term outcome. Pediatr Surg Int. 2001;27(10):1027-35. doi: 10.1007/s00383-011-2946-9.
3. Nickavar A, Otoukesh H, Sotoudeh K. Validation of initial serum creatinine as a predictive factor for development of end stage renal disease in posterior urethral valves. Indian J Pediatr. 2008;75(7):695-7. doi: 10.1007/s12098-008-0090-x.
4. Ansari MS, Gulia A, Srivastava A, Kapoor R. Risk factors for progression to end-stage renal disease in children with posterior urethral valves. J Pediatr Urol. 2010;6(3):261-4. doi: 10.1016/j.jpurol.2009.09.001.
5. Sarhan OM, El-Ghoneimi AA, Helmy TE, Dawaba MS, Ghali AM, Ibrahiem el-HI. Posterior urethral valves: multivariate analysis of factors affecting the final renal outcome. J Urol. 2011;185(6 Suppl):2491-5. doi: 10.1016/j.juro.2011.01.023.
6. Sarhan O, El-Dahshan K, Sarhan M. Prognostic value of serum creatinine levels in children with posterior urethral valves treated by primary valve ablation. J Pediatr Urol. 2010;6(1):11-4. doi: 10.1016/j.jpurol.2009.05.016.
7. Drozdz D, Drozdz M, Gretz N, Möhring K, Mehls O, Schärer K. Progression to end-stage renal disease in children with posterior urethral valves. Pediatr Nephrol. 1998;12(8):630-6.
8. Bhadoo D, Bajpai M, Panda SS. Posterior urethral valve: Prognostic factors and renal outcome. J Indian Assoc Pediatr Surg. 2014;19(3):133-7. doi: 10.4103/0971-9261.136459.
9. Coleman R, King T, Nicoara CD, Bader M, Chandran H, Robb A, Parashar K. Posterior urethral valves: creatinine velocity, a new early predictor of renal insufficiency.J Pediatr Surg. 2013;48(2):384-7. doi: 10.1016/j.jpedsurg.2012.11.016.
10. Coleman R, King T, Nicoara CD, Bader M, McCarthy L, Chandran H, Parashar K. Nadir creatinine in posterior urethral valves: How high is low enough? J Pediatr Urol. 2015;11(6):356.e1-5. doi: 10.1016/j.jpurol.2015.06.008.
11. Kari JA, El-Desoky S, Farag YM, Mosli H, Altyieb AM, Al Sayad A, et al. Renal impairment in children with posterior urethral valves. Pediatr Nephrol. 2013;28(6):927-31. doi: 10.1007/s00467-012-2390-7.
12. 12.Bajpai M, Dave S, Gupta DK.Factors affecting outcome in the management of posterior urethral valves. Pediatr Surg Int. 2001;17(1):11-5.
13. Coleman R, King T, Nicoara CD, Bader M, McCarthy L, Chandran H, et al. Combined creatinine velocity and nadir creatinine: A reliable predictor of renal outcome in neonatally diagnosed posterior urethral valves. J Pediatr Urol. 2015;11(4):214.e1-3. doi: 10.1016/j.jpurol.2015.04.007.
14. Drozdz D, Drozdz M, Gretz N, Möhring K, Mehls O, Schärer K. Progression to end-stage renal disease in children with posterior urethral valves. Pediatr Nephrol. 1998;12(8):630-6.