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 of 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
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 significantly 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.

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References

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