

Outcome of Posterior Urethral Valves in Public Sector Hospital: Challenges in Management

1. Muhammad Kashif 2. Asif Abbas 3. Mukhtar Hussain

1. Assoc. Prof. of Paediatric Surgery, 2. Asstt. Prof. of Paediatric Surgery, 3. Prof. of Paediatric Surgery,
The Children Hospital & Institute of Child Health, Multan

ABSTRACT

Objective: To adjudge the mode of presentation, upshot of treatment and complications of posterior urethral valve in our habitat.

Study Design: Descriptive study

Place and Duration of Study; This study was conducted at Department of Pediatric Urology, The Children's Hospital & ICH Multan from 1st October 2012 to October 2014

Subjects and Methods: All the information were entered on a structured sheet, like presenting features with their duration, treatment done and its outcome, complications of the disease. The data was later analyzed with the help of software.

Results: Two hundred thirty patients were included in the study. Median age ranges from 3days–10 years (median age 2.5 years). Mean time tenure before clinical presentation was 2.5 years. Obstructive symptoms were present in all patients while UTI was second most common and present in two hundred and ten patients (91%), Vesicoureteral reflux was seen in eighty patients (35%), Neurogenic bladder was present in thirty five (15%), and forty patients (17%) presented with significant renal parenchymal damage. Micturating cystourethrogram confirmed the findings of posterior urethral valve. Cystoscopy and fulguration of valves was done in all patients and supra vesical diversion was done later in selected cases.

Conclusion: Study results concluded that delayed presentation of the disease is customary in our society. This is linked with lofty morbidity and mortality rates. Efforts should be made in improving awareness among healthcare professionals at primary and secondary care centre for early diagnosis and treatment.

Key Words: Urosepsis, Vesicoureteral reflux, Renal insufficiency, Vesicostomy, Ureterostomy

Citation of article: Kashif M, Abbas A, Hussain M. Outcome of Posterior Urethral Valves in Public Sector Hospital: Challenges in Management. Med Forum 2015;26(7):

INTRODUCTION

Posterior urethral valve (PUV) is the most ordinary congenital abnormality causing bladder outflow obstruction in male infants. No studies, so far has been done that show the exact incidence of this anomaly in our population. Reports from developed countries like United States and Europe show that its incidence is 1:8000 and 1:25,000 male live births whereas, urinary obstruction diagnosed in utero is about 10%.¹

In countries with good healthcare facilities, majority of PUV cases are identified by routine antenatal scan². The grossly dilated kidneys, ureters, thick walled bladder with Key hole sign are easily identified with modern machines. As routine Ultrasonography is readily available in developed world with good expertise, majority of congenital obstructive lesions are diagnosed early.

The overall incidence of PUV in western countries is decreasing. This could be due to wide spread use of antenatal scan resulting in diagnosis and then deliberate abortion of fetuses. In a report by Cromie, extensive antenatal detection of anomalies resulted in termination of pregnancies in 46% of cases.³

Clinical presentation of PUV is variable and depends on several factors like age of presentation and types of valve. Obstructive symptoms predominate while recurrent urinary tract infection with fever and anemia are also common complaints.⁴ If diagnosis is delayed then obstruction leads to high back pressure on the renal parenchyma that results in its impairment. Several studies show that delayed treatment of PUVs is the common cause of chronic renal failure.⁵

Another report proved that, the risk factors for PUV even with good health care facilities regarding diagnosis and treatment, 13%-64% of children still deteriorate and evolve chronic renal failure.⁶ Antenatal detection and fetal intervention has no impact on the outcome of these patients. This indicates that there are still many aspects of the disease which are not completely understood.

Correspondence: Dr. Muhammad Kashif,
Assoc. Prof. of Paediatric Surgery,
The Children Hospital & Institute of Child Health, Multan
Cell No.: 0300-8637667
E-mail: dr.kashifchishti@yahoo.com

The point of study is to appraise posterior urethral valves (PUV) in a developing country with target on the mode of presentation, outcome of the disease and the difficulties of management faced in our society.

MATERIALS AND METHODS

It is a descriptive retrospective study conducted at the Department of Pediatric Urology, Children Hospital & ICH Multan. In patients whose diagnosis of PUV was confirmed with Micturating cystourethrogram and cystoscopy were reviewed and included in this study. Duration of study was of two years from 1st October 2012 to October 2014. Data such as age, presenting symptoms with their duration, complications and their management were noted on structured sheet. All basic investigations like (CBC, CUE and culture sensitivity, RPM, S/E) diagnostic imaging like Ultrasound abdomen, Voiding cystourethrogram and DTPA renal scan were done. . Some patients with renal failure were managed by the pediatric nephrology and urology units of children hospital complex.

Patients were initially stabilized with temporary catheter drainage, antibiotics and intravenous fluid if needed. Some patients with severe renal failure were managed by peritoneal dialysis. After initial stabilization, Cystoscopy and fulguration of valves was done in all patients and foley,s catheter was placed for two to five days. Patients were discharged on 2nd day with antibiotics for four to ten days. Routine first follow up was at two weeks and second follow up was at six weeks and third follow up was at 4 months. All routine tests like RPM, CUE & culture sensitivity and ultrasound abdomen were done at every visit. MCUG was done at four months and DTPA and DMSA renal scan were repeated at 6 months in patients with unilateral or bilateral reflux and renal failure.

After fulguration patients presented with VUR having recurrent acute UTI, or progressive renal deterioration, were further managed by supravescical urinary diversion. Patients with progressive renal failure were given supportive treatment in Pediatric nephrology ward with medication, peritoneal or haemodialysis. Data was analyzed by SPSS-20.

RESULTS

There were two hundred thirty patients included in the study. Median age of presentation was found 2.75 years (range 2 days to 10 years) Figure I. The mean time duration before clinical presentation was 2.59 years. Antenatal scans were available in only 10 patients (4.3%). Difficulty in passing urine was the most common abnormality found in almost all patients (100%). Second most common presentation was recurrent urinary tract infections with fever in 207 patients (90%); (Escherichia coli accounted for 66%, Pseudomonas aeruginosa 5% Klebsiella 14%), while

15% did not grow any organism. Failure to thrive was found in 65 patients (28.2%).

On examination palpable bladder was found in 175 patients (76%), anemia (haemoglobin <10 mg/dl) in 131 patients (56.9%) and high blood pressure in 20 patients (8.7%). Serum creatinine at presentation was below 1.5mg/dl in 90 patients and greater than 1.8mg/dl in 50 patients. Thirty five patients (15.2%) needed peritoneal dialysis before surgery. On cystourethrogram vesicoureteral reflux was found in 80 patients (34.7%). Unilateral reflux was found in 45 patients (19.5%) while bilateral reflux was found in 35 patients (15.2%). Large decompensated bladder was found in 35 patients (15%).

After surgery, average follow up was six to eighteen months, 150 patients (65%) remained stable and finally stopped follow up. Seventy patients (30.4%) suffered from recurrent urinary tract infection (>3 episodes /year) requiring admission in hospital and intravenous antibiotics. Persistent vesicoureteral reflux resulted in loss of one or both kidneys in 45 pts (19.5%) and cutaneous ureterostomy was performed later in 10 pts (4.3%) and none had vesicostomy. Forty five patients (19.5%) developed chronic renal failure and underwent dialysis for their survival. Peritoneal dialysis was done in 23% while haemodialysis in 8%. The record of rest of 69% could not be traced and they probably died due to lack of access to renal replacement therapy. Figure 2

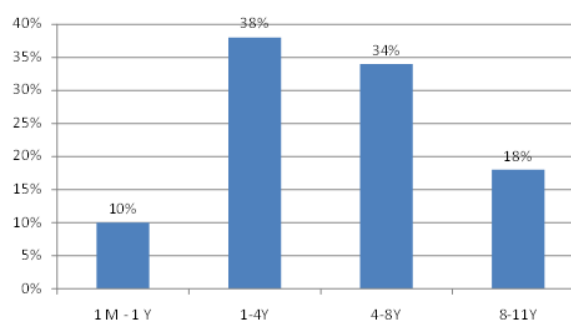


Figure No.1: Presenting age pattern

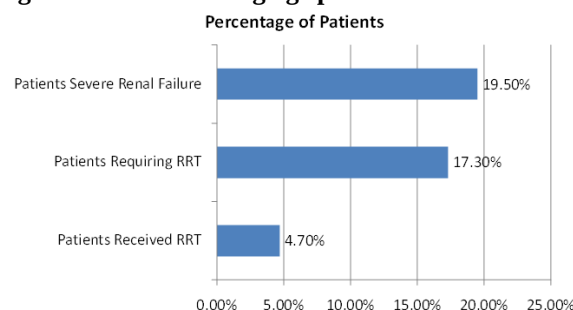


Figure No.2: Distribution of renal failure availability of dialysis

DISCUSSION

Posterior urethral valve a scarce obstructing condition that involve the whole urinary tract and if untreated can

seriously affect the life of newborn. Even with timely diagnosis and treatment, the child still faces multiple disabilities like urinary incontinence or chronic renal failure.^{7,8}

Several studies indicate that early presentation improves the overall outcome of patients with valves. But the data on this issue is conflicting. Commonly held view is that with early presentation, diagnosis can be made and proper treatment can be started. This enables protection of renal parenchyma.^{9,10} All the complications of delayed diagnosis like hydronephrosis, Urinary tract infection, urinary ascities and renal failure can be prevented.¹¹ PUV diagnosis is easy with prenatal scan in majority of cases in western world^{12,13}, only 10 (4.3%) of our patients were diagnosed on prenatal scan. Poor healthcare facilities in the periphery, poverty and inefficient system of referral to tertiary care centers are major barriers for early diagnosis.

Study by Yousaf et al have shown that contrary to early belief, early diagnosis is more commonly seen with severe degree of hydronephrosis resulting in poor survival¹⁴. In a similar study by Ansari¹⁵ and colleagues in which he compared two groups of more than 90 patients with early and late presentation. They found that all the parameters of chronic renal failure which include azotemia, increased mean serum creatinine and hypertension were more in patients who presented late. The different results in several studies indicate that there are other factors beside age in predicting outcome in valve patients.

Most common presenting symptoms of PUV reported in multiple studies were painful micturation, poor urinary flow or dribbling of urine. It was present in almost all of our patients.

Recurrent Urinary tract infection is frequently encountered complication of PUV that causes significant morbidity. It is present in 90% of our patients as well. The commonest organism encountered is Ecoli in almost 65% of cases. Many factors are responsible for this complex UTI.¹⁶ Urinary stasis due to obstruction, dysfunctional bladder, recurrent catheterisation attempts by untrained persons and VUR all contribute towards this complicated infection. Recent study by Brian Et el show that infected urine with high grade reflux can escort to renal scarring and trigger the ascension of cortical scars and renal failure.¹⁷

Increased serum creatinine score upon time of presentation is considered to be another prognostic predictor of valve patient outcome.¹⁸ Its incidence in our study was 22% (50 patients). Initial serum creatinine may be high but after urinary drainage, decreasing serum creatinine is good prognostic indicator of renal function recovery. Similarly rising serum creatinine after effective drainage of urinary tract is significant and indicates poor prognosis of outcome

of renal function. In a recent study by Coleman R on changes in creatinine velocity, 25-40% of infants of PUV even with excellent care develop chronic renal failure before reaching adult age.¹⁹

The overall incidence of VUR is high and found in one-third to one-half of patients. In our study it was present in 35% of patients. It is usually secondary to high intravesical pressure. Milder grades of reflux are resolved with conservative management but high grades of reflux occurring in a kidney with decreased GFR rarely under goes complete resolution. VUR causes progressive renal damage as evident in many patients, who had initial stable renal function nonetheless led to end stage renal failure over time. There is a strong association between progression to renal failure and risk factors such as the presence of recurrent urinary infection, bilateral vesicoureteral reflux and renal dysplasia.

Most of our children presented late with renal failure (19.5%). The justifications for shelve presentation amongst our patients are due to widespread penury and lack of diagnostic and treatment facilities in our rural population. Common misbelieve that poor urinary stream is a fugitive event and will improve with circumcision is another cause of delayed referral. All the complications of delayed presentation can be avoided with early diagnosis and prompt intervention. Patient survival rate , 68% in our society is liken to the rest of world's developed setups in Asia (87.5%) and developed countries (96.2-100%).^{21,-23}

The low survival figures in our society ask compelling attention. Special programs to educate the practitioners and medical persons at primary and secondary health care centers should be encouraged. All mothers with history of oligohydramnious should be checked for PUV when born. Patients having trait and hallmark of urinary tract infection claim entire investigations to rule out concealed urogenital congenital defect.

CONCLUSION

Early diagnosis with immediate, instantaneous and swift treatment is the corner stone for the entire upshot of PUV patients .This is peculiarly important in poor society like ours where smoothness for renal transplant and dialysis facilities for children are not cheerfully available.

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Atwell JD. Posterior urethral valves in the British Isles: a multicenter B.A.P.S. review. *J Pediatr Surg* 1983;18:70-74.
2. Tombesi MM, Alconcher LF. Short-term outcome of mild isolated antenatal hydronephrosis

- conservatively managed. *J Pediatr Urol* 2012;8: 129-33.
3. Cromie WJ, Lee K, Houde K, Holmes L. Implications of prenatal ultrasound screening in the incidence of major genitourinary malformations. *J Urol*. 2001 May;165(5):1677-80.
 4. Ahmad zadeh A, Askarpour S. Association of urinary tract abnormalities in children with first urinary tract infection. *Pak J Med Sci* 2007; 23(1):88-91.
 5. Kalhor AS, Jamro S, Abbasi A, Mughal SA. A study of posterior urethral valves. *J Surg Pak (Int)* 2008;13(3):11-5.
 6. DeFoor W, Clark C, Jackson E, Reddy P, Minevich E, Sheldon C. Risk factors for end stage renal disease in children with posterior urethral valves. *J Urol* 2008;180(4 Suppl): 1705-8.
 7. Jalbani IK, Biyabani SR. Late presentation of posterior urethral valves. *JCPSP* 2014; 24 (Special Supplement 2): S155-6.
 8. Mahadik P, Vaddi SP, Godala CM, Sambar V, Kulkarni S, Gundala R. Posterior urethral valve: delayed presentation in adolescence. *Int Neurourol J* 2012;16:149-152.
 9. Chowdhary SK, Wilcox DT, Ransley PG. Posterior urethral valves: antenatal diagnosis and management. *J Ind Assoc Paediatr Surg* 2003;8: 163-168.
 10. Ylinen E, Ala-Houhala M, Wikström S. Prognostic factors of posterior urethral valves and the role of antenatal detection. *Pediatr Nephrol* 2004; 19:874-9.
 11. Sajid NK, Ahmed S, Sarwar I. Chronic renal failure in children. *Profess Med J* 2014; 21(2):280-289.
 12. Hutton KAR, Thomas DFM, Arthur RJ, Irving HC, Smith SEW. Prenatally detected posterior urethral valves: is gestational age at detection a predictor of outcome? *J Urol* 1994; 152(2):698-701.
 13. Dinneen MD, Dhillon HK, Ward HC, Duffy PG, Ransley PG. Antenatal diagnosis of posterior urethral valves. *Br J Urol* 1993;72(3):364-369.
 14. Kibar Y, Ashley RA, Roth CC, Frimberger D, Kropp BP. Timing of posterior urethral valve diagnosis and its impact on clinical outcome. *J Pediatr Urol* 2011;7(5):538-42.
 15. Ansari MS, Singh P, Mandhani A, Dubey D, Srivastava A, Kapoor R, et al. Delayed presentation in posterior urethral valve: long-term implications and outcome. *Urol* 2008; 71(2):230-4.
 16. Bell LE, Mattoo TK. Update on childhood urinary tract infection and vesicoureteral reflux. *Semin Nephrol* 2009;29(4):349-59.
 17. Becknell B, Hains DS, Schwaderer AL, Vanderbrink BA, Spencer JD, Reagan PB, et al. Impact of urinary tract infection on inpatient healthcare for congenital obstructive uropathy. *J Pediatr Urol* 2012;8(5):470-6.
 18. 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.
 19. Coleman R, King T, Nicoara CD, Bader M, Chandran H, Robb A, et al. Posterior urethral valves: creatinine velocity, a new early predictor of renal insufficiency. *J Pediatr Surg* 2013;48(2): 384-7.
 20. Akhtar N, Ahmad TM, Abaidullah M. Outcome of posterior urethral valves in boys. *Pak Pediatr J* 2014;38(3):184-88.
 21. Asinobi AO, Gbadegesin RA, Shittu OB. A review of cases of posterior urethral valves seen at the University College Hospital, Ibadan (Nigeria). *Pediatr Med Chir* 2004; 26(6):430-3.
 22. Warren J, Pike JG, Leonard MP. Posterior urethral valves in Eastern Ontario - a 30 year perspective. *Can J Urol* 2004;11(2):2210-5.
 23. El-Sherbiny MT, Hafez AT, Shokeir AA. Posterior urethral valves: does young age at diagnosis correlate with poor renal function? *Urol* 2002; 60(2):335-8.