Management of Posterior Urethral Valves in Rural Kenya

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Abstract

Background: Posterior Urethral Valves (PUV) are the most common cause of bladder outlet obstruction in children. Early detection is necessary to prevent potentially irreversible sequel. We conducted a study to determine the presentation, interventions and outcome of patients with PUV. **Methods**: A retrospective study was conducted over a six year period with an average of two years follow-up. **Results**: The commonest presenting symptoms were dysuria (55%), poor urinary stream(67%)and straining (39%). Malnutrition was present in 36%. Four patients developed chronic renal failure. There were four mortalities due to urosepsis, acute renal failure, and complications of Mainz-II ureterosigmoidostomy. 40% of patients developed valve bladder syndrome. **Conclusion**: The high incidence of valve bladder indicates delayed intervention even when addressed in the early postnatal period. This, coupled with malnutrition call for a multidisciplinary approach and long term follow up of these patients.

Keywords: Posterior Urethral Valves, Valve Bladder Syndrome, LMICs

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Introduction

Posterior Urethral Valves (PUV) are a common cause of bladder outlet obstruction in boys. In countries where health care is optimum, the poverty rate low and the literacy rate high, the detection rate is high and early; the converse is seen in Africa (1).The incidence of chronic renal failure (CRF) is 34% and end stage renal disease (ESRD) is 10% at the end of 10 years (2). Early detection and intervention are necessary to prevent potentially irreversible sequelae. Though most men with a past history of PUV will be continent, 40% will have signs of bladder dysfunction (3). This study examines the presentation, intervention and outcomes of patients with PUVs who were seen at AIC Kijabe hospital.

Methods

A retrospective chart review of patients diagnosed with PUVs was conducted and corroborated with information from an electronic database at our hospital with is rural and has a countrywide catchment. The study period was from January 2009 to February 2015. The mean follow up period was two years.

Results

Thirty three patients were treated during the study period. The median age was 50 months (11days – 12 years). Of the children who presented below the age of 36 months, 6 (20%) presented in the neonatal period. Of those who presented above the age of 60 months, majority (9/12) were older than 10 years. Thirteen patients (39%) had persistent urinary symptoms and were managed as having valve bladder syndrome (Table 1).

Table 1: Patient Age Distribution

Age (months)	Frequency	Valve Bladder Disease
0-36	16	2
>36- 60	5	1
>60	12	9

Nine of the thirteen patients with valve bladders were diagnosed pre or intra-operatively on the basis of a severely trabeculated bladder. The remaining four were detected on subsequent clinical follow up on the basis of persistent urinary symptoms

and/or deteriorating kidney function in the absence of residual valves. One patient had residual valves confirmed by VCUG necessitating repeat procedure to relieve the symptoms.

The urinary obstructive symptoms reported were poor stream (67%), straining (39%), acute retention (27%) and dribbling (24%). The irritative symptoms reported were dysuria (55%), frequency (15%), urgency (15%) and hematuria (9%). More than 40% of children had been treated for recurrent urinary tract infections (UTI) in peripheral health facilities. Only two patients were suspected to have PUVs during the first episode of UTI. Malnutrition was present in 36% of patients, with 20% being severely undernourished with a greater than –3 Z score weight for age. Voiding cystourethrogram documented reflux uropathy in 52% of the patients.

Trans Urethral Resection of Valves (TURV) was carried out in all patients. Four patients presented with vesicostomy already fashioned. Circumcision was conducted in six patients as part of a newly developed prophylactic protocol. One patient underwent urinary diversion (Mainz II – ureterosigmoidostomy) due to severe valve bladder disease with deteriorating kidney function.

Acute kidney injury (AKI) was diagnosed in 2 patients, both presenting in the neonatal period. Two other patients developed chronic renal failure. There were 3 mortalities, one patient died from renal failure and urosepsis and two died of ESRD.

Discussion

Although the incidence of PUV has remained stable, the widespread use of prenatal ultrasound evaluation has significantly increased its early diagnosis and management. Most patients in developed countries are now diagnosed by the postnatal evaluation after a diagnosis of prenatal hydronephrosis (4). In contrast however, in most low and middle income countries (LMICs) this is not the case (1,2,5,6). The results of this study demonstrate a similar pattern where the mean age was 60.8 months and all were diagnosed postnatally. Factors that may contribute to this are, poor penetration of obstetric ultrasound utilization, poverty, low literacy rate and a small health worker to population ratio (1,7).

It is well established that one of the presentations of children with PUVs is recurrent UTIs hence the recommendation of radiological work up for male children presenting with UTIs (8,9,10). In this study 40 percent of patients had a history of recurrent UTIs that were managed by health care workers suggesting a low awareness of PUV among health care workers. Only two patients were diagnosed during the first UTI episode. Even in LMICs ultrasonography is an inexpensive and relatively available tool that can be used to screen boys with a urinary complaint. It shows good sensitivity in identifying renal tract changes due to obstructive uropathy.

Chronic illness is associated with malnutrition in children. In this study the incidence of severe malnutrition was 30%. Assessment of all pediatric patients should include anthropometric measurements so that malnourished patients are identified early and benefit from holistic care including nutritional rehabilitation (11, 12). Twenty percent of patients were circumcised as part of a hospital based prophylactic protocol to prevent recurrent UTIs. Circumcision has been demonstrated to significantly reduce the rate of recurrence of UTI in boys with posterior urethral valves (13).

Delayed valve ablation is associated with the sequelae of valve bladder syndrome and upper tract and kidney disease resulting in chronic kidney disease and end stage renal failure (14-18). In our study, greater than 40% of patients were eventually managed for valve bladder of varying severity.

Conclusion

We contend that earlier detection would be possible if the workup of all febrile UTI's in male infants included sonographic studies. As malnutrition is common, nutritional support might impact overall outcome.

References

1. Odetunde OI, Odetunde OA, Ademuyiwa AO, *et al.* Outcome of Late Presentation of Posterior Urethral Valves in a Resource-Limited Economy: Challenges in Management Hindawi Publishing Corporation International Journal of Nephrology Volume 2012, Article ID 345298
2. Thomas J. Aetiopathogenesis and management of bladder dysfunction in patients with posterior urethral valves Indian J Urol. 2010;26(4):480-9.
3. Holmdahl G, Sillén U. Boys with Posterior Urethral Valves: Outcome Concerning Renal Function, Bladder Function and Paternity at ages 31 to 44 years. J Urol. 2005;174:1031-4.
4. Brown T, Mandell J, Lebowitz RL. Neonatal Hydronephrosis in the era of Sonography. AJR Am J Roentgenol. 1987;148:959.
5. Antwi S. Audit of Posterior Urethral Valve (PUV) in Children at Red Cross Children Hospital, Cape Town, January 2002-January 2009 (Doctoral Dissertation, University of Cape Town).
6. Ikuerowo SO, Balogun BO, Akintomide TE, *et al*. Clinical and Radiological Characeristics of Nigerian Boys with Posterior Urethral Valves.

Pediatr Surg Int. 2008;24(7):825-9.
7. Carrera JM. Obstetric Ultrasounds in Africa: Is it Necessary to Promote their Appropriate Use? DSJUOG. 2011;5(3):289-96
8. Roberts KB. Urinary Tract Infection: Clinical Practice Guideline for the Diagnosis and Management of the Initial UTI in Febrile Infants and Children 2 to 24 Months. Pediatrics. 2011;128(3):595-610.
9. Robinson JL, Finlay JC, Lang ME, et al; Urinary Tract Infection in Infants and Children: Diagnosis and Management Canadian Paediatric Society Community Paediatrics Committee, Infectious Diseases and Immunization Committee. Paediatr Child Health. 2014;19(6):315-9.
10. American Academy of Pediatrics. American academy of pediatrics Clinical practice guideline: Diagnosis and management of childhood obstructive sleep apnea syndrome. Pediatrics. 2002;109:704-12.
11. Bomalaski MD, Anema JG, Coplen DE, et al. Delayed Presentation of Posterior Urethral Valves: A Not So Benign Condition. J Urol. 1999;162:2130.
12. 12. World Health Organization. Global Database on Child Growth and Malnutrition. Geneva: Who. 1997.
13. Mukherjee S, Joshi A, Carroll D, et al. What is the Effect of Circumcision on Risk of Urinary Tract Infection in Boys with Posterior Urethral Valves? J Ped Surg. 2009;44:417-21
14. 14. Ziylan O, Oktar T, Ander H, et al. The Impact of Late Presentation of Posterior Urethral Valves on Bladder and Renal Function. J Urol. 2006;175:1894.
15. Warshaw BL, Edelbrock HH, Ettenger RB, et al. Renal Transplantation in Children with Obstructive Uropathy. J Urol. 1980;123:737.
16. Parkhouse HF, Barratt TM, Dillon MJ, et al. Long-term Outcome of Boys with Posterior Urethral Valves. Br J Urol. 1988;62:59-62.
17. Ansari MS, Gulia A, Srivastava A, et al. Risk Factors for Progression to End-Stage Renal Disease in Children with Posterior Urethral Valves. J PediatrUrol. 2010;6(3):261-4
18. Ghanem MA, Wolffenbuttel KP, de Vylder A, *et al*. Long-term Bladder Dysfunction and Renal Function in Boys with Posterior Urethral Valves Based On Urodynamic Findings. J Urol. 2004;171:2409-12