

RESEARCH

Profile and Management of children with urine retention at a Tertiary Hospital in a developing country

Edwin Mwintierh Ta-ang Yenli(MBChB)*, Ken Aboah(MBChB)[†], Christian Kofi Gyasi-Sarpong(MBChB)[‡], Patrick Maison(MBChB)[‡], Roland Azorliade(MBChB)[‡], Kweku Addae Arhin(MBChB)[‡], Kweku Otu-Boateng(MBChB)[‡]

[†]Urology Unit-Department of Surgery, Tamale Teaching Hospital, Tamale-Ghana

[‡]Urology Unit-Department of Surgery, Komfo Anokye Teaching Hospital, Kumasi-Ghana

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CORRESPONDING AUTHOR CONTACT*

mwintyus@yahoo.com

+233 208162506

Abstract

Background

Urine retention is an important urologic emergency among children that is widely studied in the developed world but sparse literature exists in developing countries.

Purpose

To describe the profile of children with urine retention and the options of management at the Komfo Anokye Teaching Hospital, a tertiary hospital in Kumasi, Ghana.

Methods

We retrospectively recorded data of children who presented with urine retention at the Komfo Anokye Teaching Hospital, Kumasi, from 1stFebruary2012 to 30thDecember, 2012.The subjects' demographic data, clinical presentation, diagnosis, investigations and type of treatment offered were obtained. The data was analyzed using SPSS 20.0 for Windows.

Results

All the thirteen children who presented with urine retention during the study period were males. The mean age was 2.9 years. The causes of urine retention were; posterior urethral valves 9(69.2%), valve bladder syndrome 2(15.4%) and one each of bladder calculus and phimosis. For each of the two patients with valve bladder syndrome following valve ablation for posterior urethral valves, renal ultrasound scan showed bilateral hydronephrosis, with elevated serum creatinine and high post void residual urine. Combined day time clean intermittent catheterization and overnight bladder drainage was instituted for them.

The definitive treatment of the posterior urethral valves was endoscopic valve ablation in 7(53.8%) and catheter valve ablation in 2(15.4%). Open cystolithotomy and circumcision were offered to the subjects with bladder calculus and phimosis respectively. Immediate relief of urine retention was varied requiring the use of urethral catheterization 3(33.3%), suprapubic cystostomy 2(22.2%), or vesicostomy 2 (22.2%).

Conclusion

At the Komfo Anokye Teaching Hospital, urine retention among children was largely due to posterior urethral valves. Investigations to establish diagnosis of underlying cause of urine retention was attainable. Definitive treatment was varied and tailored to the underlying cause after initial relief of retention.

Introduction

Urine retention is the inability to empty the bladder to completion by voluntary voiding. ^{1,2}In the United States of America, neurologic conditions were the most common cause of urine retention among children.¹ In contrast, obstructive lesions such as stones were found to be the leading cause of urine retention among children in Iran.² Other obstructive lesions such as posterior urethral valves (PUV), if present, may be responsible for profound dysfunction of the entire proximal urinary tract.³ Urine retention is an important urologic emergency among children that is widely studied in the developed

world but sparse literature exists in developing countries. Acute urine retention (AUR) and chronic urine retention (CUR) in children is not well studied in developing countries. Acute urine retention presents as sudden inability to void associated with a painful suprapubic mass. Chronic urine retention patients present with difficulty in urination (there may be leaking of urine/bed wetting) associated with retention of significant post void residual urine and painless suprapubic mass. Chronic urine retention in children may date back to in-utero period and are usually associated with hydroureteronephrosis and

deteriorating renal function. Patients presenting with acute or chronic urine retention have a definite clinical picture but varied aetiologic factors. We reviewed data of children with both acute and chronic urine retention and report the options of management at the Komfo Anokye Teaching Hospital (KATH), a tertiary hospital in Kumasi, Ghana.

Methodology

Study site

The Komfo Anokye Teaching Hospital is a tertiary hospital with a bed capacity of about 1000 and located in Kumasi. KATH receives referrals from the Northern, Upper West, Upper East, Brong Ahafo, Central and Western Regions as well as parts of the Volta region. The number of urologists at the time of the study was three urologists and six urologists in training who practiced mainly open surgeries. Ethical approval was obtained from the Committee on Human Research, Publications and Ethics of the Kwame Nkrumah University of Science and Technology and Komfo Anokye Teaching Hospital.

Study design and inclusion criteria

From 1st February 2012 to 30th December 2012 we retrospectively reviewed the data of children who presented with urine retention at the Paediatric Emergency Unit and the Paediatric and Urology Out-patient clinics of KATH. Folders of children between ages 1 and 15 years who presented with urine retention at the various units were retrieved and included in the study. Data obtained was recorded on a standardized paper form and transferred to SPSS version 20.0 for windows for validation, cleaning and analysis. Data collected included age, sex, clinical presentation and investigations such as, blood urea creatinine and electrolyte, ultrasonography and cystourethrography. Descriptive statistics and frequency distribution was calculated for each variable. No multivariate analysis was done for his descriptive study.

Results

Thirteen children presented with urine retention during the study period and were all included in this analysis. They were all males with a mean age of 2.9 years table 1. Subjects with PUV were 9(69.2%) and the remaining four causes were valve bladder syndrome 2(15.4%) and one each of bladder calculus 1(7.7%) and phimosis 1(7.7%). PUV and valve bladder syndrome accounted for chronic urine retention as these were associated with hydroureteronephrosis on ultrasound scan and persistent deterioration of renal function confirmed by elevated serum creatinine. Bladder calculus and phimosis were the causes of acute urine retention. The PUVs were confirmed with micturating cystourethrogram (MCUG). Emergency management of patients with urine retention due to posterior urethral valves was varied with urethral catheterization being the predominant mode of management table 2. The definitive treatment of the posterior urethral valve was endoscopic valve ablation in 7(53.8%) and catheter valve ablation in 2(15.4%). Two subjects with valve bladder syndrome had valve ablation done previously at another center, but presented with overflow incontinence. The patients with valve bladder syndrome had no cystoscopic evidence of

remnant posterior urethral valve except hydroureteronephrosis and deterioration of renal function. Urodynamic testing was not available to assess bladder filling and emptying. Day time clean intermittent catheterization and overnight bladder drainage was instituted to decompress the bladder in the two boys with valve bladder syndrome. A 2cm bladder calculus was confirmed in one patient using pelvic ultrasonography. Open cystolithotomy was performed to remove the stone later, after initial urethral catheterization to relieve the patient of acute urine retention. One patient was diagnosed of phimosis clinically. Circumcision was done for him subsequently after initial relief using urethral catheterization. No data was available after one year of follow up of these patients.

Table 1: Age distribution of study subjects

Age(years)	1	2	3	4	5	6	Total
Frequency	2	6	1	1	1	2	13

Table 2: Emergency management of patients with urine retention due to posterior urethral valves at KATH (n=9)

Disease	Procedure	Frequency (%)
Posterior urethral valve	Vesicostomy	2 (22.2)
	Suprapubic cystostomy	2 (22.2)
	Urethral catheterization	3 (33.3)
	Catheter valve avulsion	2 (22.2)

Discussion

Our report on acute and chronic urine retention reveals that the aetiology was varied. In this study, the primary causes of urine retention in descending order were; PUV 9(69.2%), overflow incontinence from valve bladder syndrome 2(15.4%), bladder calculus 1(7.7%) and phimosis 1(7.7%). PUV and valve bladder syndrome were the underlying causes of chronic urine retention among our patients as these were associated with hydroureteronephrosis and deteriorating renal function. Bladder calculus and phimosis caused acute urine retention respectively. Gatti JM et al found neurologic conditions to be the most common cause of urine retention in the United States of America.1 Report from Gatti JM and associates revealed, the aetiology of urine retention among children were neurological in 17%, severe behavioral dysfunction in 15%, urinary tract infection(UTI) in 13%, adverse drug reaction in 13%, local inflammation in 7%, neoplasm in 6%, benign obstruction in 6%, idiopathic in 6%, combined UTI and constipation in 2% and incarcerated inguinal hernia in 2%.1 In Iran, Asgari SA et al observed that lower urinary tract stones were the most common cause of urine retention among Iranian children.2 In their report, the aetiologies of AUR in children were lower urinary tract stones (27.9%), neurological disorders (10.4%), trauma (10.4%), local inflammatory causes (9.1%), UTI (7.4%), ureterocele (7.4%), benign obstructing lesions (5.8%), iatrogenic (5.8%), constipation (4.6%), imperforate hymen (3.5%) and large prostate utricle, urethral foreign body, and rhabdomyosarcoma in 1 case each of their patients (1.1%).2 Our results were limited only to data obtained from the Paediatric Emergency Unit, the Accident and Emergency unit and the Paediatric and Urology Out-patient clinics. Data was not collected

from the paediatric wards as such some other primary causes of urine retention in children such as UTI may have been missed. Also no data was available after one year of follow up on these patients.

The incidence of PUV among children in the developed world is 1 in 5,000-12,500 live-births.^{5,6} The incidence of this disease is unknown in the African population.⁷ Among neonates and children under five years of age, PUV is the cause of a significant proportion of urine retention and may be responsible for profound dysfunction of the entire proximal urinary tract.^{3,8-10} The temporary treatment of choice for patients born with PUV entails bladder drainage by the placement of a urethral or suprapubic catheter at the time of diagnosis, followed by endoscopic valve ablation after the patient's medical status has been optimized.^{3,7} When unfit medically for primary valve ablation, cutaneous vesicostomy is the diversion of choice for neonates.^{3,11} Endoscopic valve ablation is the gold standard treatment for PUV. In resource poor communities where endoscopic facilities are usually not available, Mohan's valvotomy and Fogarty and/or Foley balloon catheter valve ablation can be invaluable alternatives.^{7,12-14} Two of our patients were managed with Foley balloon catheter valve ablation prior to the arrival of our paediatric endoscopic set and the remaining seven had endoscopic valve ablation. Seven (77.7%) of our patients were unfit medically at the time of diagnosis with dilatation of the upper urinary tract, and deranged renal function. Interventions in the form of urethral catheterization or vesicostomy had to be instituted immediately. Endoscopic valve ablation was offered when the clinical status of the patients improved. No data was available on one year post valve ablation.

Following endoscopic valve ablation for PUV, some patients may experience valve bladder syndrome caused by over distended bladder due to polyuria, increase postvoid residual urine, and impaired bladder sensation.¹⁵ Consequently, the patient develops bladder decompensation, upper tract dilatation and renal injury. Nocturnal bladder emptying has been recommended as treatment for patients with valve bladder syndrome.^{15,16} A combination of nocturnal

bladder drainage and daytime clean intermittent catheterization resolves hydronephrosis, decreases diuresis, improves continence and decreases frequency of urinary tract infection.^{15,16} Two of our patients who presented with over distended bladder following prior endoscopic valve ablation were managed with day time clean intermittent catheterization and indwelling nighttime catheter at home. Follow up renal ultrasound and renal functioning test revealed improved hydronephrosis and renal function respectively.

Though cystolitholapaxy of bladder calculus offers shorter hospital stay,¹⁷⁻¹⁹ traditional open cystolithotomy seems to be safer with comparable outcomes.¹⁹ Our patient had his bladder calculus removed via open cystolithotomy. His recovery was uneventful and he has since been stone free.

In recent years, conservative treatment for phimosis especially with the use of steroids has been promoted.²⁰⁻²³ Morris BJ however, enumerated the benefits of circumcision of males and suggested that circumcision should be routine in the twenty first century.²⁴ Circumcision is safe when experienced hands carry out the procedure. Some authors proposed that circumcision could be protective against acquiring thrush, inflammatory dermatoses, urinary tract infection, sexually transmitted human immunodeficiency virus (HIV), human papilloma virus (HPV), syphilis and chancroid.²⁵⁻³⁵ The mode of treatment for our patient with phimosis was circumcision. He recovered without complications.

Conclusion

Urine retention among children who presented at the KATH was largely caused by PUV. Investigations to establish diagnosis of underlying cause of urine retention was attainable. Initial relief of urine retention was varied with urethral catheterization being the main mode of relief of urine retention. Definitive treatment was also varied and was tailored to treatment of the underlying cause.

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