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Original Research Article

Acute urinary retention in children

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ABSTRACT

Background: Acute urinary retention is relatively infrequent in children. There are a variety of causes that are poorly defined in the literature and they differ from those seen in adult.
Methods: We review our experience with pediatric patients presenting with urinary retention at Sri Ram Murti Smarak- Institute of Medical Sciences, Bareilly. Children were reviewed from January 2012 to December 2015 from the record section of our institution. We selected 38 children for this study, of which 24 were boys and 14 girls.
Results: The most common cause in our study was mechanical obstruction in 18 children (47%). Infections were documented in 8 children (20%). Neurological causes were identified on X-rays and urodynamic studies in 5 children (13%). We could not find any cause in 3 (9%) cases (idiopathic or behavorial). 2 (5.5%) children had fecal impaction as a cause. 2 (5.5%) girls had a Gynaecological cause. 20 patients out of 38 underwent surgical procedures. 5 children under went clean intermittent catheterization programme. 13 patients were kept on medical treatment. Our study is similar to previous studies in terms of aetiology but quite different in incidence of different aetiologies. This difference in incidence might be due to different population studied in various studies.
Conclusions: Urinary retention in children is relatively rare. Urinary retention in children has various etiologies. Timely diagnosis and prompt treatment is needed because it is often associated with severe underlying disorders.

Keywords: Bladder, Children, Urethra, Urinary retention

INTRODUCTION

Acute urinary retention is a common urological emergency. In adult male population, acute urinary retention is usually due to prostatic enlargement and is common in aging males.[1] In this type of population, acute urinary retention is well studied. On the contrary, acute urinary retention is rare and therefore less explored in women and children.

Urinary retention in children is due to a variety of causes. In some children, the cause may be trivial while in others, it may be a symptom of malignancy or some severe disease, which requires prompt diagnosis and treatment. Various previous studies of pediatric urinary retention reported similar causes like infections, mechanical are neurological causes with different rates of occurrence.[2-4] The distribution of the causes by age has not been widely studied. The aim of the study was to investigate the incidence, causes, management and its outcome in cases of urinary retention amongst children attending our institution between 2011 to 2014.

METHODS

We obtained approval from present institution's ethic committee to proceed for this study, we reviewed the medical records of all children admitted to surgery-urology unit or referred from pediatric department with diagnosis of acute urinary retention from January 2012 to

November 2015 at SRMS-IMS, Bhojipura, Bareilly, Uttar Pradesh India. Children with postoperative urinary retention, acute urinary retention due to known neurological disease and neonates were excluded from present study.

In present hospital, all children presenting as acute urinary retention come to our OPD, in emergency, pediatric OPD or paediatric ward. As a protocol, all the patients of acute urinary retention were admitted in surgical ward. initially we did per urethral catheterization or suprapubic drainage if per urethral catheterization was not possible. We measured the amount of urine drained. After this full work, up was done which included complete physical examination, urine analysis, complete blood count, complete biochemical tests, ultrasonography, micturating cystourethrogam, urodynamic studies and additional tests If required.

Based on previous studies, we defined urinary retention as the inability to void urine for >12 hours in the presence of palpable urinary bladder or a urine volume greater than that expected for age calculated as age in years+2x (30) in ml of urine. Dysfunctional voiding was defined according to the international children continence society based on urodynamic studies or repeated uroflowmetery measurements. Fecal impaction was defined according to the Paris consensus on childhood constipation terminology group as severe constipation with a large fecal mass in the rectum, which is unlikely to be passed on demand.

The cause was decided only after full work up. The cause of urinary retention as idiopathic or psychological disturbances was diagnosed only after exclusion of common causes and these children need psychological evaluation. All information regarding initial presentation, treatment given, age, gender, medical history, duration of retention, residual urinary volume, diagnostic work up, final diagnosis, treatment given and followup were collected from medical records. If complete data was not available then telephonic conversation was done to get necessary details.

All clinical data were reported using descriptive statistics. The median and range were used for continuous variables. The chi-square test was used to analyse differences in categorical variables. A p value <0.05 was considered statistically significant.

RESULTS

This study included 38 children 24 boys (64%) one year to 18 years (median age 5.5 years) and 14 girls (36%) one year to 18 years (median age 4.2 years). Twenty-eight children (74%) had acute urinary retention for the first time and 10 (26%) had previous history of retention of urine. Total children admitted in surgery and pediatric wards between January 2011 to December 2014 were 2180, out of which only 64 children had acute urinary retention. In these 64 patients only 38 children with acute retention urine who were selected for our study (incidence was about 3%) according to our exclusion criteria. The age distribution in our study was not significantly different in all three groups from other studies.

Table 1: Age verses sex distribution.

Age in years	No of children	Male	Female
0-5 years	14 (37%)	9	5
6-10 years	11 (29%)	6	3
11-18	13 (34%)	7	6

Table 2: Aetiological causes and their distribution by gender.

Causes	Total children	Boys	Girls
Urethral stone	8	8	0
Bladder stone	3	2	1
Phymosis	2	2	0
Stricture urethra	0		
Tumour	1	0	1
Posterior urethral valve	4	4	0
Urinary tract infection	8	3	5
Fecal impaction	2	0	2
Neurological			
Spina bifida	2	1	1
Myelitis	1	1	0
Detrusor sphincter dyssynergia	2	2	0
Gynaecological	2	0	2
Idiopathic/psychosomatic	3	1	2

The most common cause was mechanical obstruction. It was identified in 18 children, out of which 16 were boys and 2 girls. Bladder stone and stone impacted in urethra were found in 11 children. Other causes were bladder diverticulum, late diagnosis of posterior urethral valves (4 cases), urethral strictures and phimosis (2 cases). 1 patients had sacrococygeal teratoma. An infectious pathology was seen in 8 patients. Faecal impaction was seen in 2 patients. Neurological causes were seen in 5 cases. No cause was found in 3 patients. 2 girls had gynaecological causes.

Table 3: The aetiology of urinary retention according to age.

Causes	Years n (%)	6-10 Years n (%)	>10 years n (%)
Mechanical	11	5	2
Infection/inflammation	2	2	4
Idiopathic/ psychosomatic	0	0	3
Neurological	2	2	1
Gynaecological	1	0	1
Fecal impaction	0	2	0

Ultrasonography was the most common imaging modality performed and was done in all cases. Plain Xray, CT Scan, MRI and MCU were done in few patients only when indicated. Urodynamic studies and cystoscopy were done in cases where no cause was found on above investigations. The median follow up was from 6 months to 12 months. Children underwent surgical procedures according to the cause. They were circumcision, stone milking out, stone pushback, PCCL, PUV fulguration, release of labia adhesions and drainage of hematocolpos. Urinary infections were treated conservatively. Patients were kept on clean intermittent catheterization in cases of neurogenic bladder. Fecal impaction was managed with dulcolax suppository. Patients where no cause was found were strictly followed and sent for behavorial therapy to a psychiatrist. One patient had saccrococcygeal teratoma and was operated.

DISCUSSION

This study describes 38 children, who presented to the emergency of surgery department and pediatric department of our hospital SRMS-IMS Institute of medical sciences, Bareilly, Uttar Pradesh, India. as acute urinary retention of urine. The most common cause of acute urinary retention was mechanical obstruction by stone, urethral stricture, phimosis and tumour in bladder neck area. Out of these, many children required immediate diagnosis and treatment. There was significant correlation in causes of acute urinary retention as per age and gender.

Mechanical obstruction (18 children) were noted in 16 male children and 2 girls. 8 children had urethral stone impacted in urethra. 4 out of them had stone impacted just before external meatus. They were managed by meatotomy and urethral stonemilking out. 4 patients had impacted stone in posterior urethra and pushed back in to bladder and Per Cutaneous Cystolithotripsy (PCCL) was done. Three patients had big bladder stone causing retention urine off and on and presented with acute urinary retention and they all were treated with PCCL. 4 patients presented acute urinary retention due to posterior urethral valves. These children were not diagnosed at the time of birth due to nonavailabilty of urologists. They presented late and were diagnosed on VCUG and were treated by endoscopic fulguration in three and suprapubic cystostomy in one patient due to septicemia and uremia. 2 patients had severe phymosis and were treated by circumcision. One patient was diagnosed as SOL in the pelvis. Exploration with excision was done. Histology was sacrococcygeal teratoma. Causes of mechanical obstruction leading to AUR on present study are quite different from other studies.[5-8]

Infection was diagnosed in 8 cases on routine urine examination and urine culture. In 3 male patients, positive for urine urinary infection it was actually not urinary infection but infection due to balanitis caused by phymosis. These were cases, which required only OPD based release of adherent preputial skin with some antibiotics and were cured. 5 cases in girls were due to urinary infection due to poor hygiene and lack of knowledge regarding hygienic principle. 2 cases were due to grade 1-2 vesicouretric reflux diagnosed on voiding cystourethrogram. They were all treated well on conservative treatment and appropriate counselling.

As such we excluded children with known neurological disease associated with acute urinary retention. We found five cases of urinary retention to have spina bifida occulta (2 childern) diagnosed on plain X-Ray and was treated on CIC. One child has paraparesis with retention urine and was diagnosed by neurologist as transverse myelitis and treated medically. 2 children were suspected to have some voiding dysfunction and were sent to SGPGI, Lucknow for full urodynamic studies and were diagnosed to have detrusor sphincter dyssynergia and were treated

medically and one patient had neuromodulation and responded well.

Two cases of female children with genital causes were seen. One was fused labia minora and another had imperforate hymen with hematocolpos. Both were treated surgically and recovered completely.[9] In children with idiopathic urinary retention, it is difficult to speculate on the cause. 3 cases were in this group.[10]

Constipation and its association with voiding dysfunction is well known but pathogenesis is least understood.[11] Acute urinary retention due to constipation is well documented in children.[12] One theory is that the stool – filled rectum displaces the bladder base and trigone anteriorly, impairing bladder outflow. It has been found that urethrovesical and sacral reflex function is impaired in cases with chronic constipation with majority of them had urodynamic abnormalities.[13] Due to the retrospective nature of study, we were unable to assess the relationship fully. We found only 2 cases where per rectal suppository of laxatives helped amongst these children.

CONCLUSION

Urinary retention in children is relatively rare. Urinary retention in children has various etiologies. Timely diagnosis and prompt treatment is needed because it is often associated with severe underlying disorders. Most of the time there is some obvious cause for acute urinary retention. Investigation can be micromanaged according to age and gender thereby decreasing the number of investigations required and ensuring early diagnosis. Comprehensive evaluation is needed including neurological, psychological, rectal, urine analysis, blood tests and imaging. A flow chart is provided for the evaluation of the child with acute urinary retention.

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Ethical approval: The study was approved by the institutional ethics committee

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