ORIGINAL ARTICLE

Urinary Complications Among Patients With Anorectal Malformation Seen At Gezira National Center Of Pediatric Surgery-Sudan.

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Abstract:

Background: Anorectal malformation (ARM) is a spectrum of structural congenital defects involving the anorectum and variable segments of the urogenital system in boys and girls, incidence occurs in 1 in 5000 births, The malformations range from skin level defects such as rectoperineal fistulas to complex lesions such as persistent cloaca. Urological anomalies are frequently seen in patients with anorectal malformations and can result in upper urinary tract deterioration .

Patients and methods: This study is a retrospective, descriptive, cross-secional hospital based study Conducted at Gezira national center for pediatric surgery in Sudan, from february2016 to Jan 2018, The study sample included (93 cases). the study was conducted in patients with anorectal malformation, data was collected using a questionnaire, data was analyzed using SPSS version 20.

Results: A total of 93 ARM patients where studied, 49 males and 44 females, overall urinary anomalies were 31.2% in patients of anorectal malformation, vesicoureteric reflux 12.9% was most common urinary anomaly only one needed surgery. hydronephrosis 10.8%, polycystic kidney 4.3%, solitary kidney 3.2% .the most common urinary complications recurrent urinary tract infection 18.3%, stone formation 8.6%, urinary incontinence 6.5%, urethral stricture 3.2%.

Conclusion: Urinary anomalies in patients with complex ARM are more severe than in patients with less complex ARM. Ultrasonography of the urinary tract should be performed in all patients. Voiding cystourethrography can be reserved for patients with dilated upper urinary tracts, urinary tract infections or lumbosacral and spinal abnormalities. All patients with complex ARM need urodynamic investigations. When using these indications, the screening for

urological anomalies in ARM patients can be optimized with long-term follow-up in selected patients.
Keywords: Anorectal malformation _ Urinary anomaly .

Introduction:

Anorectal malformations (ARM) have a high incidence of associated genitourinary anomalies[1] . Anorectal malformations (ARMs) are among the most frequent congenital anomalies encountered in pediatric surgery, with an estimated incidence ranging between 1 in 2000 and 1 in 5000 live births. Antenatal diagnosis of an isolated ARM is rare. Most cases are diagnosed in the early neonatal period. There is a wide spectrum of presentation ranging from low anomalies with perineal fistula having simple management to high anomalies with complex management [2] Persistent cloaca is the most severe type of anorectal malformation encountered and is seen in girls where the rectum, urethra and vagina all fail to develop and drain via a single abnormal channel onto the perineum ; Cloaca accounts for around 10% of all new ARM patients and despite the complexity of this group they are not usually assessed separately , Children with anorectal and cloaca malformations have a high incidence of associated anomalies. The most commonly associated anomalies include urinary tract, genitalia, vertebral anomalies including sacrum as well as cardiovascular, respiratory, gastrointestinal and central nervous system [3] .

Patient and Method:

This study is a combined retrospective, descriptive, hospital based study conducted at Gezira national center for pediatric surgery in Sudan, from february2016 to Jan 2018, The study sample included (93 cases). the study was conducted in all patients with anorectal malformation, data was collected by using an administered questionnaire filled with direct interview with patients and his/her co-patients in hospital and follow up data directly in outpatient clinic or via phone call following agreed on the verbal consent , data was analyzed by using SPSS version 20.

Results:

A total of 93 patients were admitted in Gezira national center of pediatric surgery with anorectal malformation, males were 53% (n=49) and 47% (n=44) were females, The majority of patients were aged less than 30days 64.5% (n=60), 1 to 12 months 23.7% (n=22), more than one year 11.8% (n=11), Most of the patients were from rural 80.3% (n=75), urban 19.7% (n=18), most of them from Gezira state 60.2% (n=56), out Gezira state 39.8% (n=37).

The patients had a variety in the ARM, perineal fistula in 17.2% (n□16), recto vestibular fistula in 32.3% (n=30), recto urethral fistula in 9.7% (n=9), recto bladder neck fistula in 6.5% (n=6), cloaca in 7.5% (n=7), imperforate anus without fistula in 26.9% (n=25).

Table(1):Type of ARM in Gezira National Centre for pediatric surgery(2016-2018) (n=93).

Type	Frequency	Percentage
Perineal fistula	16	17.2%
Recto vestibular fistula	30	32.3%
Recto urethral fistula	9	9.7%
Recto bladder neck fistula	6	6.5%
Cloaca	7	7.5%
Imperforate anus without fistula	25	26.9%
Total	93	100%

The urinary anomalies were found in 29 cases (31.2%), the most frequent urinary anomaly in anorectal malformation was vesicoureteric reflux in 12.9% (n=12), hydronephorsis in 10.8% (n=10), polycystic kidney in 4.3% (n=4), solitary kidney 3.2% (n=3). In total of 29 patients of urinary anomalies in ARM, males were 65%(n=19), females are 35% (n=10). urinary anomalies in ARM patients with perineal fistula was found in 12.5%(n=2), rectovetibular fistula 17.7%(n=5), recto urethral fistula 87.8% (n=7), recto bladder neck fistula 76.7% (n=4), cloaca42.9%(n=3), imperforate anus without fistula 32%(n=8) and there is significant relation between ARM and urinary anomalies P.value = 0.008.

Table(2): Associated urinary anomalies with type of ARM in Gezira National Centre for pediatric surgery(2016-2018) n=93).

	Associated urinary anomaly					Total
	Solitary kidney	hydronephrosis	Vesicoureteric reflux	Polycystic kidney	None	
Perineal fistula	1	0	0	1	14	16
Rectovestibular fistula	1	1	2	1	25	30
Rectourethral fistula	0	4	3	0	2	9
Recto bladder neck fistula	1	2	1	0	2	6
Cloacae	0	2	1	0	4	7
Imperforateanus without fistula	0	1	5	2	17	25
	3	10	12	4	64	93

Urinary complications in ARM were found in 37.6% (n=35), male was48% (n=17), female was 52% (n=18), the most common urinary complication in ARM was recurrent urinary tract infection in 18.3% (n=17) , followed by stone formation in 8.6% (n=8) , urinary incontinence in 6.5% (n=6) , urethral stricture in 3.2% (n=3), in patients with recto urethral fistula urinary complications were found in 88.9% (n=8), perineal fistula in 6.25%(n=1), recto vestibular fistula 33.4%(n=10), recto bladder neck fistula 66.7%(n=4),cloaca 86.8%(n=4), imperforate anus without fistula 24%(n=6) and there was significant relation between ARM and urinary complications P.value=0.001 table.

In the diagnostic work up, abdominal ultrasound was used in 49.5% patients (n=46), MCUG was used 12.9% patients (n=12) and urine analysis in 30.1% (n=28), culture and sensitivity in 7.5% patients (n=7).

Medical treatment in a form of antibiotics was utilized in 29% of patients (n=27) and anti-cholinergic 2.2%(n=2) of patients. Surgical management was tailored to12.9% of patients (n=12), in the form of following modalities vesicolithatomy in 6.5% of patients (n=6), ligation of fistula in 1.1% of patients (n=1), supra pubic catheter in 4.3% of patients (n=4) and reimplantation of ureter in one case of VUR 1.1%(n=1).

Discussion:

Urinary anomalies are frequently seen in patients with anorectal malformation. This study aimed to evaluate associated urinary anomalies and complications in patients with ARM and their plan of management. In this study males were 53%, and females were 47%, there was slight increase in male in cases of ARM ranging from 55% to 71% according to majority of studies [4,5] ,but few studies had shown the reverse [6] .

Overall the most frequent ARM subtype in females was recto vestibular fistula 68.18%. In Ethiopia it was 70%[7], cloaca 7.5%. In males the most frequent ARM subtype with imperforate anus without fistula 46.9% . In Kenya , a study reported an incidence of 31%-42% imperforate anus without fistula in male subjects [4,8] , a figure that correlates with our finding in patients of this study. The high incidence of cases of imperforate anus without fistula can be explained by the fact that distal colostogram to show the fistula is usually not done in the right way. The incidence of perineal fistula 24%, recto urethral fistula 18.3%. In another study perineal, recto urethral fistula was the predominant subtype of ARM in male [9] . Recto bladder neck 10.2%, in Ethiopia was 12% [10]. A major limitation encountered in comparing the spectrum of malformations in various publications is the use of different and inconsistent classification schemes by various authors. The adoption of the Krickenbeck classification has resulted in less confusion about the terminologies since the classification is clinically oriented.

The association of urinary anomalies was recently reviewed; in general the incidence of urinary anomalies ranges from 26% to 50% . This has been reported in the majority of studies [10], In our study urinary anomalies in ARM patients was 31.2%, and most common associated urinary anomalies in ARM was VUR 12.9% ,the incidence of vesico-urethral reflux (VUR) in patients with anorectal malformations was different in various studies . Metts and Boemers found VUR in 32% of their cases. Misra et al reported that 7.5% of patients with low deformity had VUR ,but Tohda and Moore reported the incidence of VUR only in 0.7% and 5.4% of their patients [7].In the present study hydronephrosis was observed in 10.8% of ARM patients ,other study in south Africa show hydronephrosis in 11.3% [11], and least associated urinary anomalies in our study was polycystic kidney and solitary kidney (4.3% , 3.2%). In our study urinary

anomalies in rectourethral fistula, recto bladder neck fistula, cloaca, imperforate anus without fistula, perineal fistula, with a total incidence of 88, 77, , 43, 32, 12% respectively. In other study conducted in Netherlands, urinary anomalies in complex ARM is more common than less complex ARM [(12)] . In this study the most common urinary complication is urinary tract infection in 18.3% other study show 16% [(13),] stone formation in 8.6%, urinary incontinence in 6.5% . In south Africa study showed urinary incontinence in 8.3%9 [(11)] urethral stricture in 3.2% in other A study from was 5.45% [(14),] Boemeret al. recommended that all patients with anorectal malformations should have all necessary investigations to search the associated anomalies in urinary tract abnormalities with anorectal malformation . However , the large number of patients , poor socio economic conditions and fragile primary health care services in our setting resulted in limited basic investigations rather than follow up protocols for anorectal malformation and associated anomalies. Ultrasonography of abdomen in our study was done in 49.5%, MCUG in 12.9%. In other studies ultrasound was done in all patients of ARM. In some studies MCUG was performed only when sonographic findings were abnormal [(12)] . In this study medical treatment in the form of antibiotics was used in 29%. In recurrent urinary tract infections all patients used antibiotics where as 50% of congenital hydronephrosis used prophylactic antibiotic, and in 70% of VUR used antibiotics. Anticholinergic was used in 2.2% in ARM with urinary incontinence. In this study surgical treatment was the option of management in 12.9% . Vesicolithatomy was performed in 6.5%, suprapubic catheter in 4.3%, reimplantation of the ureter in 1.1% and ligation of the fistula in 1.1%.

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