INCIDENCE OF VESICOURETERIC REFLUX IN CHILDREN WITH URINARY TRACT INFECTION AND METHODS OF MANAGEMENT

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ABSTRACT

Background:many studies demonstrated a correlation between reflux and chronic pyelonephritis in paraplegic individuals and a correlation among urinary tract infection (UTI), reflux, and chronic pyelonephritis in children, which suggested that prevention of vesicoureteral reflux may result in reduced prevalence of renal complications. The subsequent developments in the medical and surgical management of vesicoureteral reflux formed the basis of the evolving field of pediatric urology.

Aim of work: The aim of this study was to study the epidemiology of urinary tract infection and congenital vesicoureteric reflux in Sharkia Governorate including prevalence & management.

Subjects and methods: descriptive case series study was done The study population includes all patients came to pediatric surgery department pediatric urology & pediatric outpatient clinic in zagazig university hospitals from feb 2011 to feb 2012.All studied group subjected to:**1**- History taking & complete clinical examination, including:Name, age, sex, Locality, telephone number and symptoms to determine the symptomatic condition that associated with UTI & VUR.**2**- URINE analysis :All patients were subjected to complete urine analysis: Physical, chemical & microbiological , Either mid stream collection or using catheterization under complete a septic condition or using clean sterile bags.**3**- Urine culture: Sensitivity for all cases with UTI to all antimicrobial. **4**-Renal ultrasound: Was done for all cases of UTI to detect renal complication.**5**-Voiding CystoUretrogram (V.C.U.G) :Was done for cases of suspected VUR by ultrasound.**6**-Grading of patients of VUR into 3 group according to the grade A grade(I & II),B grade (III) and C grade (IV & V). **7**- Follow up the treatment of all cases regarding their grades.This study showed that there is significant association between age and UTI presence and the percentage of UTI in children <5 (16.6%) shows that there is no significant association between Respiratory symptoms & UTI . shows that there is significant association between GIT symptoms and UTI as 28.9% of UTI cases had GIT symptoms. shows that there are 32 cases of VUR among 190 cases of UTI (16.8%) from UTI cases & (2.1%) from all studied group.shows that there were 3 main group of VUR Group (A) include Grade I & II , Group (B) include Grade III and Group (C) include Grade IV& V distributed between two categories as unilateral and bilateral.shows that 100% of group (A) were medical &100% of group (C) were surgical while in group (B) there were about 58% medical & 42% surgical.

Conclusion: It can be concluded from this study that there are 32 cases of VUR among 190 cases of UTI (16.8%) from UTI cases & (2.1%) from all studied groupOur study showed that 100% of group (A) Grade I & II were medical &100% of group (C) Grade IV & V were surgical while in group (B) Grade III there were about 58% medical & 42% surgical.

Key words: Urinary Tract Infection,Vesicoureteric Reflux,pyelonephritis.

INTRODUCTION

Vesicoureteric reflux (VUR) is the retrograde flow of urine from the bladder into the ureters. It is the most common urological anomaly in children, and a major cause of end-stage renal failure and hypertension in both children and adults[(1)] .Vesicoureteric reflux (VUR) is an anatomic and functional disorder with potentially serious consequences. Vesicoureteric reflux is a common finding in pediatric practice that occurs in about 1% of children and is often familial, with several genetic loci probably involved[(1)].The majority of low-grade cases have a tendency to resolve spontaneously during childhood[(2)]. However, VUR has been identified as a risk factor for the development of urinary tract infections (UTI) and is present in one third of young children presenting with this problem. In addition, some children with high-grade VUR have already renal lesions before the advent of any UTI[(3)]. An estimated 30–40% of children under the age of 5 years who develop a urinary tract infection (UTI) have VUR. VUR can be further categorized as either primary or secondary[(4)]. Primary VUR in children is frequently attributed to an abnormally short intravesical tunnel at the ureterovesical junction, the more severe the abnormality, the worse the VUR[(4)]. Secondary VUR occurs when reflux is induced by abnormally increased bladder pressures, such as those seen with urethral obstruction or neurogenic bladder dysfunction. The risk of developing renal scars is higher in the first years of life. The current management of vesicoureteral reflux (VUR) focuses on the prevention of urinary tract infections (UTI), with curative surgery being limited to those children that fail conservative measures. This is based on the assumption that UTIs are preventable with the use of prophylatic antibiotics, leading to reduction of renal scarring, and the possibility that VUR in children can resolve spontaneously[(4)]. Endoscopic treatment for vesicoureteral reflux has become an established

alternative to long-term antibiotic prophylaxis and ureteral reimplantation[5].

SUBJECTS & METHODS

An descriptive case series study used in the study in Zagazig university hospital.

The study population includes all patients came to pediatric surgery department pediatric urology & pediatric outpatient clinic in zagazig university hospitals from feb 2011 to feb 2012

Inclusion criteria:

- patients came to pediatric surgery department pediatric urology & pediatric outpatient clinic in zagazig university hospitals from Feb 2011 to Feb 2012

Exclusion criteria:

- Refusing to participate in the study.

Sample size: All population with inclusion criteria studied

Tools: All studied group subjected to

1- History taking & complete clinical examination, including:

- Name, age, sex, Locality, telephone number &
- Symptoms to determine the symptomatic condition that associated with UTI & VUR.

2- URINE analysis: All patients were subjected to complete urine analysis: Physical, chemical & microbiological. Either mid stream collection or using catheterization under complete a septic condition or using clean sterile bags.

3- Urine culture :Sensitivity for all cases with UTI to all antimicrobial.

4- Renal ultrasound:Was done for all cases of UTI to detect renal complication.

5- Voiding CystoUretrogram (V.C.U.G) :Was done for cases of suspected VUR by ultrasound.

6- Grading of patients of VUR into 3 group according to the grade

A grade I & II

B grade III

C grade IV & V

7- Treatment of cases of VUR whether medical or surgical.

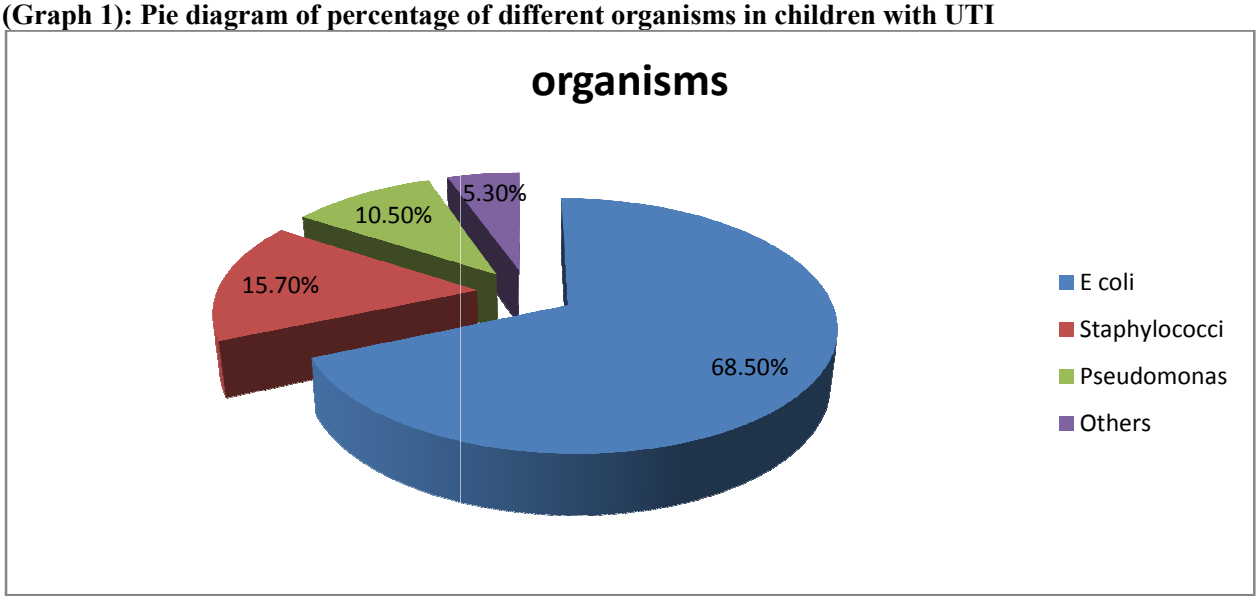
8- Follow up the treatment of all cases regarding their grades.

RESULTS

This study showed that there is significant association between age and UTI presence and the percentage of UTI in children <5 (16.6%) is greater than percentage of UTI in older children (8.6%). As regard sex distribution we found that there is significant association between sex and UTI presence and the percentage of female with UTI (15%) more than percentage of male with UTI (10%).

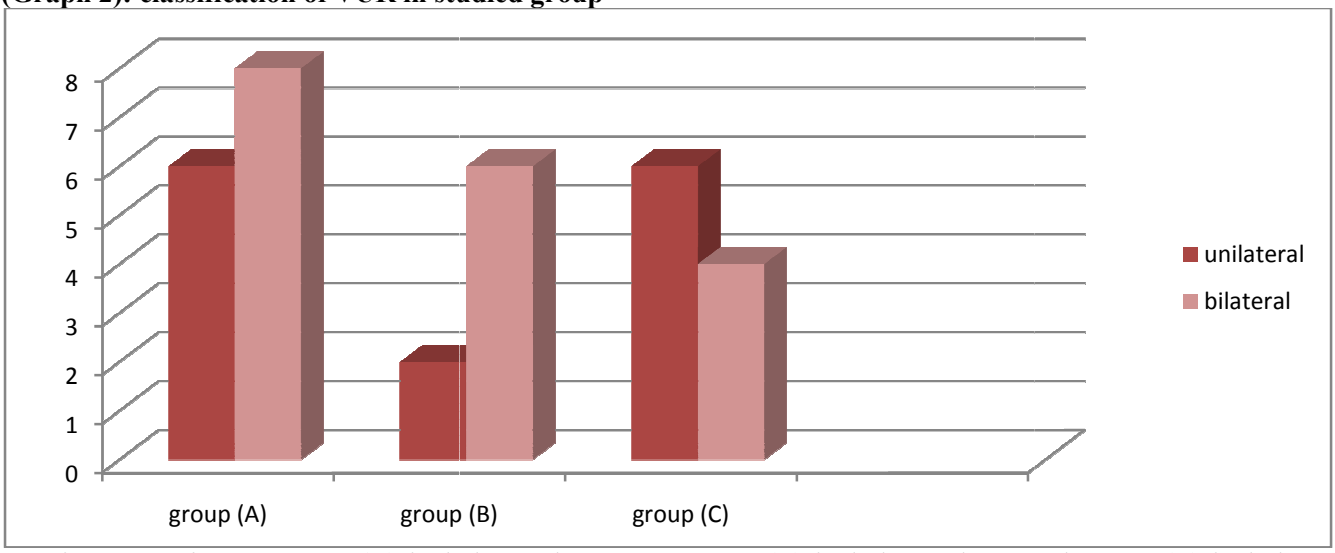
Also showed that there is no significant association between cough and UTI so cough is not significant symptom for UTI, but this study showed that Vomiting is significant symptom for UTI as 42.1% of UTI cases had vomiting showed that there is no significant association between crying and UTI so crying was not significant symptom for UTI. Also showed that there is no significant association between Nasal discharge and UTI so Nasal discharge is not significant symptom for UTI. And showed that there was no significant association between Dyspnea and UTI so Dyspnea was not significant symptom for UTI. shows that Diarrhea is significant symptom for UTI as 28.9% of UTI cases had Diarrhea. shows that there is no significant association between nocturnal enuresis and UTI so nocturnal enuresis is not significant symptom for UTI. showed that there is no significant association between Respiratory symptoms & UTI . our study showed that there is significant association between GIT symptoms and UTI as 28.9% of UTI cases had GIT symptoms. shows that (47.4%) of UTI cases presented with fever. Also this study showed that E.coli was the most prevalent organism in children with UTI**(graph 1).** Our studyshowed that there are 32 cases of VUR among 190 cases of UTI (16.8%) from UTI cases & (2.1%) from all studied group.showed that there were 3 main group of VUR Group (A) include Grade I & II , Group (B) include Grade III and Group (C) include Grade IV& V distributed between two categories as unilateral and bilateral**(graph 2).** our study showeds that 100% of group (A) were medical &all cases of group (C) were surgical while in group (B) there were about 58% medical & 42% surgical**(table 1).**

(Graph 1): Pie diagram of percentage of different organisms in children with UTI



Graph 1 shows that E.coli was the most prevalent organism in children with UTI

(Graph 2): classification of VUR in studied group



3 main group of VUR Group (A) include Grade I & II , Group (B) include Grade III and Group (C) include Grade IV& V distributed between two categories as unilateral and bilateral.

(Table 1): classification of type of treatment VUR in studied group.

VUR=32	Unilateral	Bilateral	TOTAL	X^2	P
Group (A)				**7.5**	**NS**
(medical)	**6 (100%)**	**8 (100%)**	**14**		
(surgical)	**0**	**0**			
Total	**6**	**8**	**14**		
Group (B)				**0.17**	**NS**
(medical)	**1 (50%)**	**4 (66.7%)**	**5**		
(surgical)	**1 (50%)**	**2 (33.3%)**	**3**		
Total	**2**	**6**	**8**		
Group (C)				**0.74**	**NS**
(medical)	**0**	**0**	**1**		
(surgical)	**6 (100%)**	**4 (100%)**	**9**		
Total	**6**	**4**	**10**		

Table 1 shows that 100% of group (A) were medical &all cases of group (C) were surgical while in group (B) there were about 58% medical & 42% surgical.

Our study showed that 13 cases need surgical intervention, 3 cases treated by endoscopic method 2 cases (66.7 %) were free as regard clinical , laboratory and radiological follow . 1 case (33.3 %) shows grad 1 reflux by VCUG follow up**.**And 10 cases treated by open surgical method6 cases treated by Lich – Gregior, 5 cases (83.3%) of them were free as regard clinical and laboratory follow up and 4 cases (66.6%) were free as regard radiological (VCUG) follow up , 1 case (16.6 %) showed grade I reflux and 1 case (16.6 %) showed persistent reflux .Also 4 cases were treated by Cohen Transtrigonal technique , 3 cases (75%) of them were free as regard clinical ,laboratory and radiogical follow up and 1 case (25 %) showed grade II reflux on radiological follow up.

DISCUSSION

Urinary tract infections in children are a significant source of morbidity, particularly when associated with anatomic abnormalities [(6)].Vesicoureteral reflux is the most commonly associated abnormality, and reflux nephropathy is an important cause of end-stage renal disease in children and adolescents. However, when reflux is recognized early and managed appropriately, renal insufficiency is rare. Some children who present with an apparently uncomplicated first urinary tract infection turn out to have significant reflux. [(7)].Subclinical infections can sometimes lead to severe bilateral renal scarring. Therefore, even a single documented urinary tract infection in a child must be taken seriously. [(7)].Our study include 1500 infant and children from pediatric surgery and pediatric urology outpatient clinic .190 of them had UTI.

Regarding sex we found that there is significant association between sex and UTI presence and the percentage of female with UTI (15%) more than percentage of male with UTI (10%). , this may be due to short urethra in female. This result was in agreement with [(8)] who consider sex as UTI risk factor.

Regarding age our study showed that there is significant association between age and UTI presence and the percentage of UTI in children <5 (16.6%) is greater than percentage of UTI in older children (8.6%). This result was in agreement with [(1)]who showed in his study prevalence rates of UTI (70% of patients younger than 1 year, 25% in patients aged 4 years, 15% in those aged 12 years, and 5.2% in adult patients).

Regarding some symptoms and their association with UTI we found that that there is no significant association between Respiratory symptoms like cough, Nasal discharge & dyspnea and UTI so we

figured that Respiratory symptoms is not significant symptom for UTI. We also found that shows that there is significant association between GIT symptoms like vomiting & diarrhea and UTI as 28.9% of UTI cases had GIT symptoms. Our study found that there is no significant association between crying and UTI so crying is not significant symptom for UTI.

Also our study found that there is no significant association between nocturnal enuresis and UTI so nocturnal enuresis is not significant symptom for UTI. Our study found that (47.4%) of UTI cases presented with fever so its important symptom should be considered in diagnosis of UTI. This was in agreement with [(1)] who reported that 49% in febrile children aged (3-16 years) by culture of clean catch or catheter urine sample had UTI.

[(9)]said that after examination of 132 children reported that the most frequent isolated bacterial species was E.coli (76%). And this was in agreement with our study as we found that the most frequent isolated bacterial species was E.coli (68.5%). According to various published estimates, VUR is present in 29%–50% of children with urinary tract infection (UTI) and in approximately 10% of infants with antenatal hydronephrosis[(10)].

A **(11)**study showed that the incidence of VUR of any grade after first febrile UTI in 699 children aged 2 month to 2 years was 29.5% and high-grade VUR was present in 119 children (17%).The most common problem abnormalities associated with UTI is VUR it is found in 20-40% of children with acute pyelonephritis [(12)].This was in agreement with our study which showed that there are 32 cases of VUR among 190 cases of UTI (16.8%) from UTI cases & (2.1%) from all studied group. [(13)]also agree with our result where he found that 8-40% of children being investigated for their first UTI had VURI. Our study showed that 100% of group (A) Grade I & II were medical & most cases of group (C) Grade IV & V were surgical except one case in unilateral group while in group (B) Grade III there were about 58% medical & 42% surgical. [(14)]also emphasis on his meta-analysis that grading is so important in determining type of treatment & prognosis.

Regarding types of surgical intervention our study reported that 13 cases (3 from GROUP B & all GROUP C (10)) need surgical intervention, 3 cases treated by endoscopic method (GROUP B) and 10 cases treated by open surgical method (GROUP C).

This was in agreement with studies said that low to moderate grade VUR has a high tendency to resolve spontaneously, it is also the case that these grades of VUR can usually be corrected with a single endoscopic injection, [(15)].

In a cohort of 101 children, 51 had primary surgical management performed by a fellowship-trained pediatric urologist, 18 by a general urologist, 6 by a pediatric surgeon, and 9 by an unknown surgeon. Following successful reclosure, 38 patients eventually developed adequate bladder capacity for bladder neck reconstruction, and only 26% [(10)] eventually achieved dryness. These data emphasize the need for initial successful reconstruction and suggest that individuals undertaking this reconstruction should be comfortable with the complexity of repair. It is prudent for the surgeon who may see only a few patients with this condition to consider referral of these complex management situations to a center where special expertise and experience exist,[(15)].

In our study we showed that 3 cases treated by endoscopic injection 2 cases (66.7 %) were free as regard clinical, laboratory and radiological follow. 1 case (33.3 %) shows grad 1 reflux by VCUG follow up.

Also from 10 cases treated by open surgical intervention 6 cases treated by Lich – Gregior technique and 4 cases treated by Cohen Transtrigonal technique. Andfrom 10 cases treated by open surgical intervention 6 cases treated by Lich – Gregior, 5 cases (83.3%) of them were free as regard clinical and laboratory follow up and 4 cases (66.6%) were free as regard radiological (VCUG) follow up , 1 case (16.6 %) showed grade I reflux and 1 case (16.6 %) showed persistent reflux .Also 4 cases were treated by Cohen Transtrigonal technique , 3 cases (75%) of them were free as regard clinical ,laboratory and radiogical follow up and 1 case (25 %) showed grade II reflux on radiological follow up.

CONCLUSION

It can be concluded from this study that there are 32 cases of VUR among 190 cases of UTI (16.8%) from UTI cases & (2.1%) from all studied group.Our study showed that 100% of group (A) Grade I & II were medical , all cases of group (C) Grade IV & V were surgical while in group (B) Grade III there were about 58% medical & 42% surgical.

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