

Evaluation of Urinary Bladder Pathologies among Sudanese Children by Ultrasound

Wadah M. Ali^{1,2}, Mowada Burai³, Shamsaldeen Altaheir³, Mogahid M. A Zidan⁴,
Mohammed Alhadi A. Ibrahim⁵

¹Medical Imaging Department, College of Allied Medical Science, Gulf Medical University, Ajman, UAE

²Nuclear Medicine Department, Radiological Science and Nuclear Medicine College, The National Ribat University, Khartoum, Sudan

³college of radiological science and medical imaging, Alzaeim Alazhari University P.P. Box 1432, Khartoum north, Sudan

⁴Al-Ghad International College for Applied Medical Science, Medical Imaging Technology Department, Abha, KSA

⁵Nuclear Medicine Department, Radiation and Isotopes Center of Khartoum, Khartoum, Sudan

Abstract: *The urinary bladder pathologies are most common problems in children and it is difficult to evaluate by one radiological modality for definite diagnosis and assessment. Study was performed to evaluate urinary bladder pathologies in children by ultrasound examination. A total of 100 patients were examined in this study. The data collected from three hospitals in Khartoum state from January 2016 to July 2016. The patients were examined with the own department protocol using ultrasound machines. The study founded that (66%) of patients are male patients. There are ranged from one year old to less than nineteen years old age. The largest age group founded in the study was patients between one year old to 4 years old representing (40%) of all patients. The most common symptoms were found is hematuria (21%) and the most common pathology in children after normal urinary bladder was cystitis, which representing (24%). **Conclusion:** males were more affected with urinary bladder pathologies in children than females and the most common pathology of the urinary bladder in children was cystitis.*

Keywords: Urinary bladder, Symptoms, cystitis, recurrent UTI

1. Introduction

Ultrasound is the first investigation in all children suspected has any urinary tract abnormality. The findings of the ultrasound will then direct further investigation, so it is crucial that the sonographer performs a meticulous examination with a properly prepared child.^[1]

One of the abdominal organs that is assessed during transabdominal ultrasound examination for urological reasons is the urinary bladder. The bladder must be filled with urine, this prerequisite for reliable assessment.^[2]

The following urinary bladder pathologies will be discussed in this study which is divided it to anatomical defects (like urachus remnants, ureterocele), tumour-like lesions in the lumen of the urinary bladder (such as blood clots, fungus balls, stones or foreign bodies), bladder wall pathologies (like cystitis), urinary bladder dysfunction, urinary bladder tumors and bladder trauma.^[2]

Most of the congenital anomalies are diagnosed during the neonatal period such as mega ureter, urachal remnants and vesical duplication anomalies. Today, bladder exstrophy is generally detected on routine prenatal ultrasound.^[3]

Bladder agenesis is extremely rare. Bladder exstrophy is a rare condition in which the bladder is open anteriorly. Prune-belly syndrome is a syndrome of variable severity in which the anterior abdominal musculature is deficient. The Upper tracts are dilated, with dysplastic kidneys. Classically the prostate is deficient and the bladder is dilated and contracts poorly.^[4]

Bladder diverticula may be congenital or acquired. Congenital diverticula are known as Hutch diverticula and are located near the ureteral orifice.^[4]

Most acquired diverticula result from bladder outlet obstruction. Bladder fistulas may be congenital or acquired. Causes of acquired fistulas include trauma, inflammation, radiation, and neoplasm.^[5]

Inflammatory lesions consist of acute bacterial cystitis is extremely common and usually associated with Gram-negative coliforms, particularly *Escherichia coli*, *Klebsiella* and *Pseudomonas* species. Chronic cystitis may result in a number of structural and pathological changes.^[5]

Emphysematous cystitis is rare condition associated with diabetes mellitus and is usually due to *E. coli*. Viral infection is most often due to adenovirus 11 in childhood. It may be quite aggressive. Malakoplakia is thought to be a mild form of chronic granulomatous disease leading to chronic ineffective response to urinary tract infections. Tuberculosis represents 10-20% of genitourinary tuberculosis and is virtually always associated with renal tuberculosis.^[4]

Schistosomiasis (bilharziasis) is endemic in Africa and western Asia. *Schistosoma haematobium* involve bladder trigone and adjacent ureteral segments.^[6]

Bladder injury may be the result of blunt, penetrating, or iatrogenic trauma and may result in extraperitoneal or intraperitoneal rupture or a combination.^[5]

Volume 5 Issue 11, November 2016

www.ijsr.net

Licensed Under Creative Commons Attribution CC BY

Urinary bladder tumours composed of benign and malignant, benign tumour are papilloma, leiomyoma, nephrogenic metaplasia or adenoma, Malignant neoplasms transitional cell carcinoma, adenocarcinoma, squamous cell carcinoma, lymphoma, sarcoma, rhabdomyosarcoma, carcinosarcoma and sarcomatoid carcinoma or metastasis.^[6] Bladder dysfunction is classified into an uninhibited neurogenic bladder, hyperreflexive detrusor (reflex neurogenic, contractile bladder), areflexic detrusor (autonomous neurogenic, flaccid bladder), and sensory or motor paralysis.^[6]

2. Materials and Methods

The data used in this study were collected from cases admitted to various hospitals in Khartoum state (Soba university hospital, Omdurman Military hospital, Khartoum teaching hospital and other diagnostic centers) during the period from January 2016 to July 2016, one hundred children cases of urinary tract symptoms have been studied.

Ultrasound examinations is done by using three ultrasound machine Toshiba- Xario100 transabdominal convex transducer with frequency of 3.5 MHz , Hitachi Aloka-Prosound Alpha 7 and SSD-1000 convex array transducers with frequency of 3.5 to 5.0 MHz and Mindary M7,DC-N2 and DC-N, Convex array transducers with frequency of 3.5 to 5.0 MHz.

Inclusion criteria- The study included all patients below 18 years old, who they had urinary tract symptoms.

Exclusion criteria- Patients of adult age group. Cases selection was done in the criteria of history, clinical examination and ultrasound examination.

Study was conducted under the following parameters:

- a) History taking
- b) clinical examination
- c) ultrasound examination

3. Observations and results

3.1 Age group and gender distribution

Table 1: Age group distribution

Age groups (years)	Frequency	Percentage
1-4	40	40%
5-9	28	28%
10-14	22	22%
15-18	10	10%

Table 2: Gender distribution

Gender	Frequency	Percentage
Male	66	66%
Female	34	34%

Out of the patients, 66 % (66) patients were males and 34 % (34) patients were female (Table 2). Male to Female ratio is 3:1. Out of total 100 patients, majority of them were in the age group of 1-4 years, 5-9 years 9 (28%), 10-14 years (22%) followed by 15-18 years (10 %). Mean age is 9.5 years (Table 1).

3.2 Signs and Symptoms

Out of 100 patients, majority had recurrent UTI 18% (18) Patients, burning micturition 12% (12) Patients, dysuria 7% (7) Patients, supra-pubic pain 6% (6) Patients followed by urine retention 6% (6) Patients. Of the total patients hematuria was major signs 21% (21) Patients. (Graph 1).

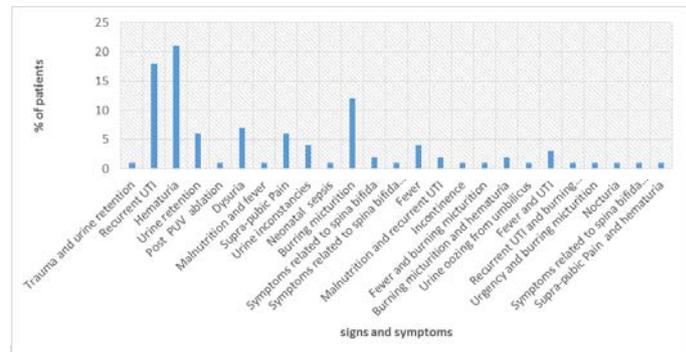


Figure 1: shows distributions of patients with urinary bladder pathologies according to symptoms:

3.3 Ultrasound Findings

Out of 100 patients ultrasound examination was done 100% (100) patients, cystitis was seen in 24% (24) patients, vesical stones was seen in 10% (10) patients , schistosomiasis was seen in 9% (9) patients , neurogenic bladder was seen in 7% (7) patients and PUV was seen in 5% (5) patients (Graph 2).

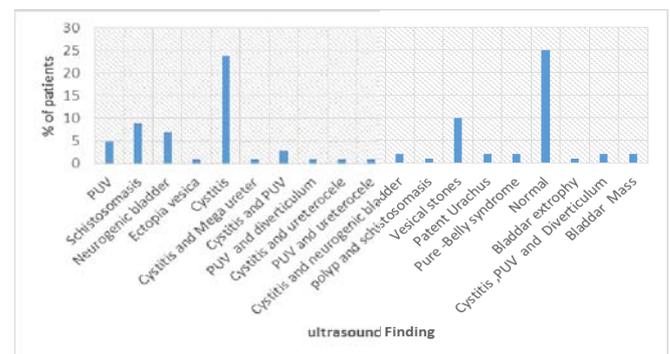


Figure 2: shows distributions of patients with urinary bladder pathologies according to ultrasound diagnosis

4. Conclusion

The ultrasound has a role for evaluating children with urinary bladder pathologies by interpretations the ultrasound findings for the specific diagnosis. The study showed that male patients are more than female patients, the most common presenting symptoms is hematuria and the common urinary bladder pathology diagnosed by ultrasound in children other than normal urinary bladder is cystitis followed by vesical stones and urinary bladder schistosomiasis. The study observed that as the age is increased the urinary bladder pathologies is decreased.

References

- [1] Rose D B. Pediatric ultrasound, how, when and why. London: Elsevier;2005:39-112.

- [2] Andrzej S, Tomasz S, Tomasz G, Oksana O, Stefania B. Sonography of tumors and tumors-like lesions that mimic carcinoma of the urinary bladder. J Ultrason. 2014 Mar;14(56): 36-48.
- [3] Sarah E.M, David M.H, Dean A. N, Martin I. R. Sonography of the Urinary Bladder. Ultrasound Clin 2(2007): 17-26.
- [4] David Sutton. Textbook of radiology and imaging. 7th ed. London: Elsevier; 2003: 989-1016.
- [5] Rumack CM, Wilson SR, Charboneau JW, Levine D. Diagnostic Ultrasound. 4th ed. St. Louis, MO: Mosby; 2011: 317-391.
- [6] Jovitas Skucas. Advanced Imaging of the Abdomen. London: Springer; 2006: 685-717.

Author Profile



Wadah Mohammed Ali: Award B. Sc. Degree from the National Ribat University in Nuclear Medicine 2007, M. Sc. from Sudan University of Science and Technology in Nuclear Medicine 2010 and M. Sc. in Radiation Protection & Environmental Science from

Sudan Academy of Science (SAS) 2015. He has been working as NM specialist at Radiation and Isotopes Centre of Khartoum RICK during 2007-2010 and a lecturer in National Ribat University since graduation to 2015. From 2016 he worked as Assistant professor at Gulf Medical University, UAE



Mr. Mogahid M.A Zidan received the B.Sc. and M.Sc. degrees in diagnostic medical imaging from National Ribat University and Sudan University of science and Technology in 2012 and 2016, respectively. During 2012 -2016, he stayed in

Khartoum teaching hospital, Khartoum north teaching hospital, alzytouna Specialist hospital, and national Ribat University. He now lecturer in Al-Ghad International College for Applied Medical Science, KSA.