



Original Article

A Study of Urinary Tract Problems using Ultrasound Imaging

Noor Sehar Nadeem^{1*}, Akash John², Abid Ali³, Tahira Fatima¹, Zainab Saghir¹ and Vaneeza Tasaddaq¹¹University Institute of Radiological Sciences and Medical Imaging Technology, The University of Lahore, Gujrat, Pakistan²University Institute of Radiological Sciences and Medical Imaging Technology, The University of Chenab, Gujrat, Pakistan³Department of Allied Health Sciences, The University of Chenab, Gujrat, Pakistan

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*Corresponding Author:

Noor Sehar Nadeem
University Institute of Radiological Sciences and Medical Imaging Technology, The University of Lahore, Gujrat, Pakistan
noorsehar700@gmail.comReceived Date: 17th December, 2022Acceptance Date: 22nd January, 2023Published Date: 31st January, 2023

ABSTRACT

Problems of the Urinary Tract are one of the most widespread infectious diseases, if left uncontrolled; it could really result in serious complications that can cause acute and chronic urinary tract failure. **Objective:** To assess the Urinary Tract Problems using Ultrasound Imaging. **Methods:** It is cross-sectional research conducted at the Radiology Department of District Health Quarter Hospital, Gujranwala, Pakistan from 1, August 2022 to 30, November 2022. Abdominal Ultrasound Techniques was performed in a supine position. A sample size of 102 patients has been calculated via a convenient sampling technique. The patients under the age of 10 years were not included. The data was collected, calculated, and analyzed using SPSS version 26.0. **Results:** Most of the patients complaining Urinary Tract Problems were between the age of 40 to 80 years 59(57.8%). It was more common in males 54(52.9%). Most of the patients came for Ultrasound had the past history of UTI. Most of the patients came with pain and burning while urination 36(35.3%). The most common cause of Urinary Tract Problems was hydronephrosis 74(72.5%). **Conclusion:** Urinary Tract Problems were developed in any age group and most common in males. The major cause of Urinary Tract Problem was Hydronephrosis.

INTRODUCTION

A prevalent clinical issue, urinary tract infections can affect the lower urinary tract [1]. The urinary system is made up of the organs that are responsible for urinating and releasing it from the body, including the urethra, urinary bladder, ureters, kidneys, and other supporting organs [2]. The urethra is only 3 to 4 cm length in females. The urethra in men measures about 20 cm in length [3]. If pyuria and bacteriuria are found in a urine sample that has been correctly collected, a UTI can be identified [4]. Urological disorders, such as vesicoureteral reflux, constipation, or voiding dysfunction, increases the risk of UTI. Numerous risk factors that increase the likelihood of treatment failure, recurrent infections, substantial morbidity and death, and unfavorable outcomes might further aggravate

UTIs [5]. UTI is classified according to site, episode, symptoms, and complicating factors. It is advised to have an ultrasound of the urinary system to rule out obstructive uropathy [6]. According to United States the most frequent infections treated as outpatients in are UTIs [7]. Urinary tract infections cause over 8 million doctor visits annually in the United States [8]. According to Worldwide 150 million people get Urinary Tract Problems [9]. The Department of Nephrology at the Sindh Institute of Urology and Transplantation in Karachi, Pakistan, states that a number of variables, including age, gender of the female patient, co-morbidities, the type and dosage of immunosuppression, the use of urological equipment, and the length of the post-kidney transplant follow-up period,

affect the occurrence of UTI [10]. Chronic renal scarring may be related to UTI and result in hypertension, proteinuria, pregnancy complications and even progressive renal failure [11]. UTI has become the most common hospital-acquired infection, accounting for 35% of nosocomial infections, and it is the second most common cause of bacteremia in hospitalized patients [12]. Urinary tract infections occur commonly both in inpatient and outpatient settings [13]. Compared to men, UTI is more common in women [14]. One of the most frequent causes of unexpected fever in newborns is a urinary tract infection. Males are more frequently affected during the first 12 weeks of life, probably because structural abnormalities are more common. An ultrasound is one of the suggested diagnostic images in the assessment of the UTI in males [15]. It is frequently brought on by digestive tract bacteria that can rise to the urethral opening and cause infection. (15) Based on the underlying causes, the mortality rate for older adults with UTI can range from 0% to 33% [16]. The method of choice for this study is to use ultrasound imaging to diagnose a few disorders in a variety of individuals, including males, females, and children [17]. Ultrasonography of the renal tract is recommended at the very least to check for any lesions or anatomical anomalies such as hydronephrosis or stones [5]. Along with the identification of blockage, masses, calculi, and vascular anomalies, it also includes the evaluation of renal size, cortical thickness, and echogenicity [18]. The objective of the current study was to determine the frequency and pattern of urinary symptoms among patients visiting a hospital. The current study will instruct the people about pain and burning while urination and prepare radiologists to identify the different conditions of pain in lower urinary tract.

METHODS

A descriptive cross-sectional study conducted at the District Health Quarter Hospital, Gujranwala, Pakistan. The data were collected during the period of 4 months from 1st August 2022 to 30th November 2022. The data were collected using simple random sampling. Abdominal Ultrasound Techniques was performed in a supine position. A sample size of 102 patients has been calculated via a convenient sampling technique. The patients under the age of 10 years were excluded. The patient of any gender was included. The patients of diseases other than lower urinary tract problems were excluded [19]. The equipment used for scan is Toshiba Ultrasound Machine [20]. Convex probe with frequency 3.5-6MHz was used to get optimum result [21]. The data were collected, calculated, and analyzed using SPSS version 26.0.

RESULTS

Most of the patients complaining urinary tract problems were between the age of 40 to 80 years 59 (57.8%). It was more common in males 54 (52.9%). Most of the patients came for ultrasound had the past history of UTI. Most of the patients came with pain and burning while urination 36 (35.3%). The most common cause of urinary tract problems was hydronephrosis 74 (72.5%). Table 1 shows the sonographic findings of the patients. The sonographic findings of patients were bladder wall thickened 6(5.9%), free floating internal echoes seen 4(3.9%), renal simple or cortical cyst 8(7.8%), enlarged prostate 4(3.9%), ureter dilatation 2(2.0%), and renal concretions 12(11.8%).

Sonographic findings	F (%)
Bladder wall thickened	6(5.9)
Free floating internal echoes seen	4(3.9)
Renal simple or cortical cyst	8(7.8)
Enlarged prostate	4(3.9)
Ureter dilatation	2(2)
Renal concretion	12(11.8)
Others	66(64.7)
Total	102(100)

Table 1: The sonographic findings of patients

Table 2 shows the level of hydronephrosis, hydro pelvis and hydroureter in patients. The patients with mild were 16(15.7%), moderate 4(3.9%), severe 2(2.0%) and focal 6(5.9%).

Level of hydronephrosis, hydro pelvis and hydroureter	F (%)
Mild	16(15.7)
Moderate	4(3.9)
Severe	2(2)
No	74(72.5)
Focal	6(5.9)
Total	102(100)

Table 2: Shows the level of hydronephrosis, hydro pelvis and hydroureter in patients

Table 3 shows the causes of urinary tract problems. The causes were obstructive uropathy 6(5.9%), renal and ureteric stones 9(8.8%), pregnancy 5(4.9%), benign prostatic hypertrophy 6(5.9%), hydronephrosis 74(72.5%) and others 2(2.0%).

Causes	F (%)
Obstructive Uropathy	6(5.9)
Renal and Ureteric Stones	9(8.8)
Pregnancy	5(4.9)
Benign Prostatic Hypertrophy	6(5.9)
Hydronephrosis	74(72.5)
Others	2(2)
Total	102(100)

Table 3: The causes of urinary tract problems

DISCUSSION

Urinary tract problems are most common disease in

hospital setting. Initial urinary tract problems are mainly occurred due to obstruction of urinary tract. Obstruction is occurred due to stones or lesions located in renal ureteric and urinary bladder [22]. The normal urinary tract is an open system that carries urine without a clear anatomic break from the renal tubules to the urethra [23]. The current study was actually conducted at the Radiology Department of the District Health Quarter Hospital in Gujranwala to measure the findings of ultrasound in the urinary tract. In the current study 102 patients were examined on ultrasound who were expected to have urinary tract problems. The patients that were taken in the current study mostly the males 54(52.9%) between the age group of 40 to 80 years 59(57.8%). A similar study by Lo *et al.*, showed that males had greater UTI prevalence's. The prevalence of etiologic agents observed in this study with regard to gender and age reflect the pattern seen in a population that spontaneously seeks care at a DHQ hospital. Past history of UTI was the strongest risk factor in the current study. The current study showed that mostly patients had come with the past history of UTI 70(68.6%). A recent study by Lo *et al.*, found that a history of UTI was a major risk factor for urinary tract problems, which primarily affected men [24]. According to this study mostly patients came to hospital with pain and burning sensation while urination 36(35.3%). The current findings visualized on ultrasound shows that most common was hydronephrosis 74(72.5%), hydroureter or hydro pelvis which was the most common cause of urinary tract problems. A previous study by Fatima *et al.*, published in 2018 showed the similar results that the classification of hydronephrosis had been assessed on the degree of dilatation of pelvicalyceal system of the kidneys [25]. According to current study the renal and ureteric stones were the 2nd major cause of urinary tract problems either present in kidneys or urinary tract. The relative risk of UTI in kidney transplant patients is increased by renal stone disease. The current study showed the renal parenchymal changes that were also the important findings which checked the corticomedullary dimensions of the kidneys. Mostly patients were diagnosed with Grade I echogenicity 18(17.6%). The researcher Donatini *et al.*, showed the similar findings of the corticomedullary findings of the kidneys [26].

CONCLUSIONS

In conclusion, most of the patients that were admitted to the radiology department were adult males who had symptoms of pain and burning during urination. The most frequent cause of UTI was hydronephrosis, hydroureter, or hydro pelvis, which is also the most common finding on ultrasonography.

Conflicts of Interest

The authors declare no conflict of interest.

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