



## EVALUATION OF VESICAL PATHOLOGY USING ULTRASOUND

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**ABSTRACT** **AIM OF STUDY:** The objective of this study is to evaluate the common urinary bladder diseases compared with relationship between the age, gender & nationality.

**MATERIAL & METHOD:** This prospective study carried out on 214 patients of various types of Vesical pathologies, ages, gender & nationalities Consultant Medical Clinic in Riyadh K.S.A within one year June 2015-June 2016, using standard ultrasound machine equipped with Doppler facilities, the data were analyzed by using SPSS program.

**RESULTS:** The commonest urinary bladder disease in both sexes was the chronic cystitis 64 (30.0%) while Urinary bladder polyps 2 (0.93) and urinary bladder diverticulum 2 (0.93%) as compared to other urinary bladder diseases was found relatively rare.

**CONCLUSION:** The commonest pathology in both sexes was chronic cystitis 64 (30.0%) and the second commonest was chronic prostatitis with chronic cystitis 24 (11.2%) in male.

**KEYWORDS :** Urinary bladder, ultrasound, Doppler, chronic cystitis.

**INTRODUCTION:**

Urinary bladder pathologies include: Inflammations, cystitis, acute cystitis, chronic cystitis, cystitis cystic, interstitial, cystitis (Hunner's ulcer), leukoplakia, parasitic infection. Tuberculosis, calculi Stone in bladder, Epithelial tumors, tumors of bladder, miscellaneous conditions, malakoplakia, diverticul, bone formation hematuria and Trauma Congenital Anomalies of urinary bladder<sup>(12,17)</sup> Ultra sound is the most appropriate modality of diagnosis of the pathologies of urinary bladder due to its noninvasive nature, ease of examination, high resolution in real time mode and visualization of fine details without the use of radiation and contrast medium and low cost make it virtually a investigation of choice. Ultra sound is also very effective in differentiating between the benign and malignant bladder conditions and helps in early treatment and interventions. This study was aimed to evaluate the common urinary bladder diseases compare the relationship between the age, gender & nationality in Saudi and expatriates male and female at Consultative Medical Clinics, Naseem, East of Riyadh, K. S.A.

**BACKGROUND:**

The Urinary bladder is a hollow muscular situated entirely within the pelvic cavity, the urinary bladder distends its domes up into the abdominal cavity, the empty bladder is a flattened three sided pyramid, with the sharp apex pointing forwards to the top of the pubic symphysis and a triangular base facing backwards in front of the rectum or vagina, store urine excreted by the kidneys before disposal by urination, affected by many diseases within short-period, chronic or fatal to people of all ages, gender & nationalities, the common urinary bladder diseases are the followings:- bladder (vesical) calculi are stones or calcified materials that are present in the bladder,<sup>(2)</sup> acute cystitis is Virulence of *E. coli* in acute pyelonephritis, acute cystitis and asymptomatic bacteriuria,<sup>(1)</sup> chronic cystitis is interstitial cystitis, a chronic painful and irritative pelvic disease of unknown etiology, characterized by symptoms very similar to those experienced by women with bacterial cystitis, pain, urgency, and frequency,<sup>(3)</sup> urinary bladder diverticula are frequently resulting from obstructions,<sup>(11)</sup> urinary bladder polyps are benign lesions with no malignant potential, but they can have varied form of presentation, the most commonly in the genito-urinary tract are fibro epithelial polyps,<sup>(9)</sup> urinary bladder carcinoma (transitional cell carcinoma) is the most predominant histological type, urinary bladder cancer is highly chemo sensitive,<sup>(13)</sup> benign prostatic hyperplasia (BPH) represents considerable health problem to aging men through its associated signs, symptoms and complications,<sup>(7)</sup> Chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS) is the most common of the prostatitis syndromes, it is

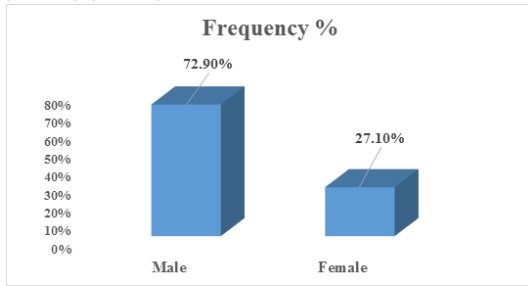
characterized by pelvic pain, with or without voiding symptoms,<sup>(8)</sup> benign prostatic hyperplasia (BPH) is a histological diagnosis associated with unregulated proliferation of connective tissue, smooth muscle and glandular epithelium, (BPH) may compress the urethra and result in anatomic bladder outlet obstruction (BOO); BOO may present as lower urinary tract symptoms (LUTS), infections, retention and other adverse events,<sup>(16)</sup> and the bladder obstruction is less in women than in men and not suspected in women, while anatomic causes such as pelvic prolapse or obstruction after anti-incontinence surgery are often reasons,<sup>(5)</sup> posterior urethral valves (PUV) are the most common cause of bladder outlet obstruction (BOO) in infancy,<sup>(6)</sup> schistosomiasis or bilharziasis is urogenital schistosomiasis, chronic infection by schistosoma haematobium, worm oviposition in the bladder wall leads to granulomatous inflammation, fibrosis, and egg expulsion into the urine,<sup>(14)</sup>

**MATERIALS AND METHODS:**

A total of 214 patients complaints (kidney, urinary bladder and prostate symptoms diseases) keeping the main objective of summing up of the urinary bladder pathologies, were examined at Consultative Medical Clinics, Riyadh, K. S.A., within the period January/2015-December /2015, in both medical imaging department, using standard Siemens sonoline versa pro 400 ultrasound machine equipped with a 3.5 and 5.0 MHZ convex probes with Doppler facilities and attached image enhancer screen and a Sony video graphic printer up 890 MD, the protocol of examinations in all cases examined is before ultrasound scan start, the bladder should be full enough degree since fluid may provide the window necessary for adequate pelvic scanning, Scanning done while the patient lying relaxed, comfortable and breathing quietly in supine position, lower abdomen was lubricated with coupling agent to avoid of air bubbles between the skin and ultrasound transducer, Transverse (axial) images are obtained with angled caudal to show the bladder base, Sagittal and oblique sagittal images complete the examination, moving transducer cephalic and then angling caudal are necessary to show the bladder base, color Doppler ultrasound was used to detect vasculatures of urinary bladder masses, The protocol of comparing the echopatterns of adjacent organs was always maintained in each and every patient, all the data collected was preserved and stored in a software compact disc for any legitimate investigations, and for further publications and reviews, results overviews in a form of tables of frequency and percentages & using Nova Testing method identifying the vesical pathology in relation to the, age, gender and nationality of the patient.

**RESULTS:**

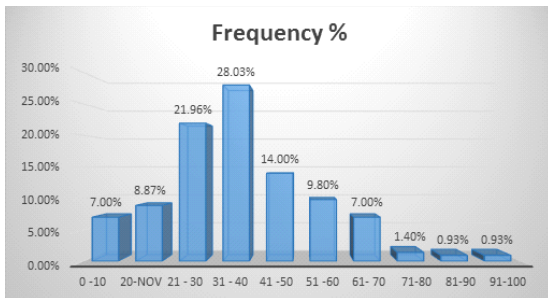
These total of 214 patients were examined, complains urinary bladder symptoms diseases, patients examined was 156(72.9%) male and 58 female (27.1%), male to female ratio 2.7:1(figure.1), their age (0-100yrs the mean age is 50yrs), the maximum age of patients complain urinary bladder symptoms diseases was the group of age 31-40 years 60(28.03%),(Table.1).



**Figure.1:** shows distribution of the patients for Vesical Pathology according to sex

**Table (1) shows frequency of Patients According to Age Groups**

Age group (years)	Count	Frequency
0-10	15	7.0%
11-20	19	8.87%
21-30	47	21.96%
31-40	60	28.03%
41-50	30	14.0%
51-60	21	9.8%
61-70	15	7.0%
71-80	3	1.40%
81-90	2	0.93%
91-100	2	0.93%

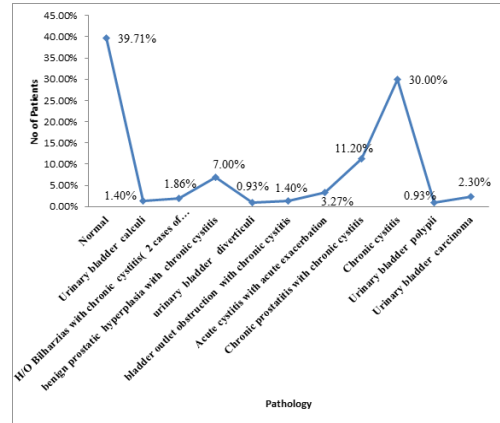


**Figure.3:** shows the frequency distribution of patients according to age groups in percentage

These total of 214 patients were examined, complains urinary bladder symptoms diseases, patients examined was 85(39.7), 129(60.3%) abnormal finding distributed as urinary bladder polyp 2(0.93%), urinary bladder diverticulitis 2(0.93%), urinary bladder outlet obstruction 3(1.4%), urinary bladder calculi 3(1.4%), H/O Bilharziasis with chronic cystitis 4(1.80%), urinary bladder carcinoma 5(2.3%), acute cystitis with acute exacerbation 7(3.27%), benign prostatic hyperplasia with chronic cystitis 15(7.0%), chronic prostatitis with chronic cystitis 24(11.2%) and chronic cystitis 64 (30.0%),(Table-2).

**Table (2) shows frequency of pathologies**

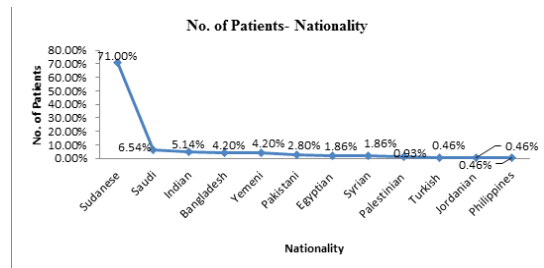
Pathology	Count	Frequency
Normal	85	39.71
Urinary bladder calculi	3	1.4%
H/O Bilharzias with chronic cystitis ( 2 cases of per vesical fibrosis)	4	1.86%
benign prostatic hyperplasia with chronic cystitis	15	7.0%
urinary bladder diverticuli	2	0.93%
bladder outlet obstruction with chronic cystitis	3	1.4%
Acute cystitis with acute exacerbation	7	3.27%
Chronic prostatitis with chronic cystitis	24	11.2%
Chronic cystitis	64	30.0%
Urinary bladder polypii	2	0.93%
Urinary bladder carcinoma	5	2.3%



**Figure.3:** shows distribution of patients according to type of pathology in percentage

**Table.3: shows the frequency of patients according to nationality.**

Nationality	Count	Frequency
Sudanese	152	71.0%
Saudi	14	6.54 %
Indian	11	5.14 %
Bangladesh	9	4.20 %
Yemeni	9	4.20 %
Pakistani	6	2.80%
Egyptian	4	1.86%
Syrian	4	1.86%
Palestinian	2	0.93 %
Turkish	1	0.46 %
Jordanian	1	0.46 %
Philippines	1	0.46 %



**Figure.4:** shows distribution of the patients according to nationality

**Nova testing results:**

**Nova testing:**

We are following the nova testing for our data analysis as these results.

**ONEWAY: Age Nationality Gender BY Pathology**

**Oneway**

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
Age	Between Groups	18042.31	9	2004.701	40.398	.000
	Within Groups	5905.237	119	49.624		
	Total	23947.55	128			
Nationality	Between Groups	28.910	9	3.212	.558	.829
	Within Groups	685.013	119	5.756		
	Total	713.922	128			
Gender	Between Groups	4.342	9	.482	3.073	.002
	Within Groups	18.681	119	.157		
	Total	23.023	128			

- **Age & Vesical Pathology:** according to Nova Testing,000 giving significant result that very strong relationship between the Vesical Pathology and age.
- **Nationality & Vesical Pathology:** according to Nova Testing,829 no relationship between Vesical Pathology and nationality.
- **Gender & Vesical Pathology:** strong according to Nova testing,002 giving significant result that strong relationship between Vesical Pathology and sex.

**NOTE:** Nova Testing relationship gives significant,000-.05(Nova Rules)

**DISCUSSION:**

According to the ultrasound scanning, we use of various techniques and manipulation to client proper patient examination to obtain the best possible clear view images in the normal and abnormal cases and further investigations were performed in positive cases to confirm the pathology which was tentatively diagnosed at the ultrasound examination like various laboratory tests and I V U and C T Scan abdomen with and without contrast examination for the final diagnosis and the Nova testing method was used for data analysis, the most complainers were found in the age group of 31 –40 years 60/214 (28.03%), (Table-1, graph-2), both in males and females together, while the commonest pathology in both sexes was chronic cystitis 64 /214(30.0%), (Table.2 ,figure.3) , when we compare these result with the result studied by ( Mustafa Z. Mahmoud , Bahaedin A. Elkader. Ultrasound In The Incidence of Urinary Bladder Diseases, Khartoum Teaching Hospital – Sudan, International Journal of Basic and Applied Medical Sciences 2012 ;2:161-153)<sup>(15)</sup> their pathological findings in the untreated urinary bladder of Sudanese subjects included such abnormalities, Cystitis (acute, chronic) was found in (47.6%) among 250 Sudanese patients complain of urinary bladder symptoms their result was agree with our result that the commonest pathology in both sexes was chronic cystitis, while when we compare the causes of chronic cystitis (Aging relationship) with the study by ( Julius F. Metts, M.D. Interstitial Cystitis: Urgency and Frequency Syndrome. Am Fam Physician 2001; 64:1199-1207.)<sup>(6)</sup> which (The onset of interstitial cystitis (chronic cystitis) usually occurs between 30 and 70 years of age, with a median age of 43, the prevalence of the disease appears to be increasing among young and middle-aged women), we agree with their study as we found chronic cystitis 64/214 (30.0%) is the commonest pathology in both sexes and the most complainers were found in the age group of 31 –40 years 60/214 (28.03%) (Table.1, figure.2), also when we compare our result of urinary bladder polyps 2/214 (0.93) are relatively rare with the result of ureteral fibro epithelial polyps with calculi by (Tahsin Turunc, Baris Kuzgunbay, Tuba Capolat. Ureteral fibro epithelial polyps with calculi: a case series. Journal of Medical Case Reports 2008; 2: 1947-1752.)<sup>(15)</sup> rarely seen, & also relatively rare, when we compare our result with the result by (Abhay Kumar, Suren K. Das, Sameer Trivedi, Udai S. Dwivedi, Pratap B. Singh. Genito –urinary polyps :summary of the 10 –years experiences of a single institute. International Urology and Nephrology 2008;40 :907-901 )<sup>(9)</sup> their study was the presence of polyps in the urinary tract is rare , chronic cystitis also correlated with others pathologies as our results ,the patients with history of Bilharzias is correlated with chronic cystitis 4/214(1.80%) contracted in the child hood showing signs of peri cystic fibrosis, the benign prostatic hyperplasia correlated with chronic cystitis 15/214(7.0%) and correlation of chronic prostatitis with chronic cystitis 24/214(11.2%) is the second commonest pathology in men, while bladder outlet obstruction 3/214(1.4%) showed signs of chronic cystitis and considerable post void residual volume of urine signs of chronic cystitis.

**CONCLUSION:**

After this study we conclude that the maximum complainers were found in the age group of 31 – 40 years 60 which illustrated in (Table.1 and figure.2) both in males and females together the commonest pathology in both sexes was chronic cystitis which appear clear in (Table.2 and figure.3) and the second commonest was chronic prostatitis correlated chronic cystitis in male, urinary bladder polyps also urinary bladder diverticulum are rare. Ultra sound was found most Quick efficient & cheaper diagnostic modality in urinary bladder pathologies as compared to other investigations, e.g. (CT Scan & MRI modalities).

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