

INDEXING



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Conclusion should elucidate how the results communicate to the theory presented as the basis of the study and provide a concise explanation of the allegation of the findings.

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Hepatitis: Screening and Preventive Measures

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A significant public health issue around the world is viral hepatitis, which is brought on by infection with one of the hepatitis viruses. Reviewing the information that is currently available suggests that the South-East Asia Region has a high prevalence of infection with hepatitis viruses A-E. Hepatitis A virus seroprevalence rates are high among enterically transmitted viruses in the majority of the Region's countries, albeit they have recently decreased. Hepatitis A clinical cases, particularly severe forms of the disease, have increased as a result of the rise in the average age at first exposure. Hepatitis A vaccination is available, however it has not yet been used in the Region as a public health precaution. Hepatitis E virus infection is extremely prevalent in many nations, where it frequently leads to waterborne epidemics and accounts for about half of all cases of acute viral hepatitis.

The risk of these illnesses increases with rapid urbanization's lack of access to clean, safe drinking water, nutritious food, and adequate sanitation. Hepatitis B infection rates among bloodborne hepatitis viruses range from low, intermediate, and high among different nations in the region. Either of these viruses can cause persistent infection. Although frequently asymptomatic, persistent infection with these viruses can cause the development of cirrhosis and liver cancer, which are major causes of death in the region. These infections are especially prevalent in some particular population groups, including as intravenous drug users, those who have received blood transfusions, and people who are immunosuppressed. Additionally, certain regions do not screen blood and blood products for substances that cause viral hepatitis. As a result, acute and chronic hepatitis caused by hepatitis virus infection account for a large portion of the disease burden in the South-East Asia Region and cause over 500 000 fatalities there each year. We can lessen our risk of contracting hepatitis in a variety of ways, including by getting vaccinated against hepatitis A and B, using condoms during sexual contact, not sharing needles when using drugs, maintaining good personal hygiene by thoroughly washing our hands with soap and water, refraining from using infected people's personal items, and exercising caution when visiting places with poor sanitation.



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Celiac Disease: An Autoimmune Disorder

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Celiac disease is an autoimmune disease that is triggered due to the ingestion of a protein called gluten that is naturally present in many cereal grains. Inadequate response of both the adaptive as well as the innate immunity to gluten in genetically susceptible people is involved that leads to the enteropathy of the intestine, thus damaging the intestinal mucosa that leads to malabsorption of different nutrients. It is one of the most common disorders, however many cases are not identified and are left untreated. The occurrence of Celiac disease involves a triad of genes, exposure to gluten and other environmental factors such as gastrointestinal tract infection during infancy or any other early life factor that influences the intestine. Wide range of symptoms are reported in patients that are classified as gastrointestinal and non-gastrointestinal symptoms ranging from abdominal pain, bloating, diarrhea, vomiting, anemia to complications such as osteoporosis, neurological abnormalities and hepatitis. There are different tests that can be used for the diagnosis of celiac disease, these are known as serological tests that include Antigliadin antibodies, Antiendomysial antibodies, Anti tissue transglutaminase antibodies and HLA typing. The most important aspect of this disease is its proper management through diet and counselling of the patient as it's a lifelong diet. Gluten free diet should be recommended to patients in which they are supposed to avoid any product containing gluten such as wheat, rye, barley, instead alternatives such as corn, flax and quinoa should be used to make different products. The amount of processed and packaged foods also needs to be minimized, lactose containing products such as milk and other dairy products need to be avoided as a celiac disease patient becomes lactose intolerant during the initial stages of diagnosis. Due to malabsorption of nutrients, a diet rich fat soluble vitamins and folic acid should be consumed as these micronutrients are the most effected and not absorbed. Moreover, foods that are a rich source of high bioavailable iron such as meat, poultry and fish should be consumed to prevent anemia. For the better implementation of this diet and lifestyle, proper nutrition education should be provided to the patient and his family regarding the disease, its causes, complications and proper management.



Original Article

Diagnosis of Urinary Tract Urolithiasis using Computed Tomography

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ABSTRACT

Renal stone disease is the most common urinary system disease, existing in third after urinary tract infection and prostate disease in urological departments and accounting for 10-15% of all cases. **Objective:** To evaluate urolithiasis on Computed Tomography (CT KUB). **Methods:** It is a cross sectional study carried out at the private Sector Hospital of Gujrat, Pakistan over 4 months from December 2021 to March 2022. A sample size of 50 patients was calculated via a convenient sampling approach using the mean from previous related studies. Patients with kidney stones diagnosed on CT KUB scan were included after informed consent. The data was analyzed and entered using SPSS version 21. **Results:** The result of this study revealed that people in their 51s and 60s are the most affected and that males are 56% more likely than females to have kidney stones. The right kidney is the most prevalent location for stones. The calcium oxalate kidney stone scale ranged from 1 to 50 mm in diameter. And the correlation between the location of kidney stone and size is 0.94 so there is a moderate correlation between stone size and location. **Conclusion:** In conclusion, the CT equipment is fully capable of detecting and measuring stones, as well as determining their type and major component.

INTRODUCTION

Kidney stones, urinary tract infections, and prostate disorders are all frequent urinary system diseases, but urolithiasis is the most prevalent of them all [1]. Kidney, ureter, the urinary bladder, and the urethra make up urinary system [2]. The kidneys are in charge of producing urine, while the rest of the system is charge of removing it [3]. Poor oral fluid intake, high oxalate intake and a high salt intake are all common risks factors for stone development [4]. Kidney stones can be excruciatingly painful [5]. Kidney stones may not cause symptoms until they start moving down the ureters. In men, the pain in groin area due to renal stone is common [6]. Renal colic is a painful condition that comes and goes. Hematuria, nausea, vomiting, discolored or foul-smelling urine, chills, and fever are some of the other symptoms that may be present [7]. In pregnant women, renal stones are a prevalent cause of non-

obstetrical stomach pain [8]. Right kidney is the most occurring site of kidney stones. The majority of renal calculi are made up of calcium oxalate crystals combined with various levels of calcium phosphate [9]. Calcium oxalate stones that are not associated to an acquired are known as idiopathic calcium oxalate stones [10]. They account for 50% of all calcium oxalate stones. Struvite in 10%, uric acid in 9%, and cystine-containing stones in 1% of patients are identified with renal calculi [11]. The majority of idiopathic calcium oxalate stones appear to form on the papillary surface of the kidney, either linked to a calcium phosphate subepithelial plaque known as Randall's plaque or within the apertures of terminal collecting ducts [12]. Chronic renal illness, hypertension, gout, diabetes mellitus, hyperlipidemia, obesity, endocrine disorders and malignancies are all medical conditions that increase the



risk of kidney stones [13]. Over weight, hyperlipidemia, and type-2 diabetes mellitus are all linked to uric acid and calcium oxalate stones [14]. High urinary calcium oxalate saturation is also seasonal with men experiencing it in the summer and women experiencing it in the early winter [15]. The renal pelvis was shown to be the most common site for stones (18.3%) [16]. When ureter stones lead to hydronephrosis, 50.8 percent of stones induce glomerulonephritis (27.9% low, 57.4% intermediate, and 14.7% severe). The stones in the ureter is one of the most common site causing glomerulonephritis [17]. CT is the most effective for detecting and measuring stones, and their components [18]. To begin treatment, series of X-ray images from various angles are obtained, which are then combined with computer processing to provide cross-sectional images of bones and soft tissue inside the body [19]. A CT scan of the urinary tract can help a doctor figure out the cause of blood in the urine, obstruction, frequency or urgency of urination, and urine incontinence [20]. Urolithiasis affects persons in their 50s and 60s and males are 55% more likely than females to acquire kidney stones [21]. The expense of treating renal stones in the United States has been approximated at 2 billion dollars [22]. Kidney stone frequency varies greatly around the globe, with rates ranging from 1-5% in Asia, 5-9% in Europe, and 7-15% in America [23]. Renal stones impact somewhere around 1% to 16% of people across the world at some point in their life [24]. Ecological factors such as diet and lifestyle may play a role, as evidenced by the wide variety of rates and historical trend studies that show increased prevalence rates in recent years. In 2015, there were 22.1 million reported cases, with 16,100 deaths. The overall incidence of urolithiasis increased considerably throughout the course of the trial, rising from 108 per 100,000 in the first year intervals to 138 per 10,000 over the last year intervals. This study was intended to illustrate the characterization of renal stones using CT scan. The study identified most affected age group, gender as well as assessment of size, location and density of renal stones. The current study determined the location of renal stones and the prevalence of certain chemical compositions of different sizes of renal stones which can be helpful in further investigation at early times.

METHODS

It was a cross-sectional study conducted over 4 months. Data was collected from a private hospital. A sample size of 50 patients was calculated by a convenient sampling technique using the mean from previous related studies [24,7,25]. Neusoft 16 slices 120-140 KVP, 320 MAS, 5mm slice thickness CT equipment was utilized to collect KUB CT images. The patients who were diagnosed with kidney

stones during CT scan were included. All of the patients who agreed to participate gave their verbal consent, and their medical histories were recorded.

RESULTS

This study included 50 patients of urolithiasis. The males were more commonly affected 28(56%) than females 22(44%). Table 1 show that the elderly age group patients more common to have renal stones 15(30%) and on second number adults are commonly effected 16(16). Table 2 show that the most common location of kidney stone was right pelvic kidney 15(30%) and 2nd most common location of stones was left pelvic kidney 8(16%). Table 3 show that the size of kidney stone most commonly found was 1-50mm in 16(32%). The second most common stone size in kidney was 51-100mm in 11(22%). Table 4 shows that the mean value of age groups was 28.200, Mean of value of stone size was 1.7200cm, std deviation of age and size of stones was 1.56087 and 1.65418. Table 5 shows cross-tabulation of location and size of kidney stones. Table 6 shows that the correlation between location of kidney stone and size was 0.94 so there was moderate correlation between stone size and location.

Age of Patients	Frequency	Valid%	Cumulative%
1-17years	6(12.0)	12.0	12.0
18-30years	5(10.0)	10.0	22.0
31-40years	8(16.0)	16.0	38.0
41-50years	10(20.0)	20.0	58.0
51-60years	15(30.0)	30.0	88.0
61-70years	6(12.0)	12.0	100.0
Total	50(100)	100.0	

Table 1: Frequency distribution of age group

Age of Patients	Frequency	Valid%	Cumulative%
Right Upper Ureter Stone	2 (4.0)	4.0	4.0
Right Distal Ureter Stone	5 (10.0)	10.0	14.0
Right Pelvic Kidney Stone	15 (30.0)	30.0	44.0
Left Pelvic Kidney Sytone	8(16.0)	16.0	60.0
Left Upper Pelvic Junction	7(14.0)	14.0	74.0
Right Pelvic Junction Stone	6(12.0)	12.0	86.0
Left Distal Ureter Stone	5(10.0)	10.0	96.0
Left Lower Ureter Stone	2(4.0)	4.0	100.0
Total	50(100.0)	100.0	

Table 2: Frequency distribution of the location of stones

Sizes of stones	Frequency	Valid%	Cumulative%
1-50	16(32.0)	32.0	32.0
51-100	11(22.0)	22.0	54.0
101-149	7(14.0)	14.0	68.0
150-200	7(14.0)	14.0	82.0
201-249	5(10.0)	10.0	92.0
250-300	4(8.0)	8.01	100.0
Total	50(100.0)	00.0	

Table 3: Frequency distribution of sizes of stones

Report	Age of patients (yrs)	Sizes of stones (cm)
Mean	28.200	1.7200
SD	1.56087	1.65418
Minimum	1-17 years	1-50
Maximum	61-70 years	250-300
Median	3.0000	1.0000

Table 4: Descriptive statistics of age of patients and size of stone

sizes of stones * location of kidney Crosstabulation									
		Location Of Kidney							
		Right Upper Ureter Stone	Right Distal Ureter Stone	Right Pelvic Kidney Stone	Left Pelvic Kidney Sytone	Left Upper Pelvic Junction	Right Pelvic Junction Stone	Left Distal Ureter Stone	Left Lower Ureter Stone
Sizes of Stones	1-50	2	5	9	0	0	0	0	16
	51-100	0	0	6	5	0	0	0	11
	101-149	0	0	0	3	4	0	0	7
	150-200	0	0	0	0	3	4	0	7
	201-2492	0	0	0	0	0	2	3	5
	50-300	0	0	0	0	0	0	2	4
Total		2	5	15	8	7	6	5	50

Table 5: Cross tabulation of Location and size of stone

Symmetric Measures		Value	Asymp. Se ^a	Approx. T ^b	Approx. Sig.
Interval By Interval	Pearson's R	.974	.010	20.413	.000 ^c
Ordinal By Ordinal	Spearman Correlation	.942	.015	19.446	.000 ^c
N		50			

Table 6: Correlation between location of kidney stone and size

DISCUSSION

In the current study total number of patients selected were 100 to evaluate kidney stones using computed tomography. The age of patients in this study ranged from 1 to 80 years. Kidney stones are most commonly presented in people with which low intake of water found. Computed tomography is the best modality to evaluate urolithiasis. In the current study, males were most commonly affected with kidney stones 28(56%) than females 22(44%) due to low fluid intake. A previous study [26] also reported that males were most commonly to have kidney stone than females. In the current study, it was observed that elderly people were most commonly involved in this disease. The age group of 51- 60 years had 15(30%) kidney stones and the second age group which was most commonly affected with this disorder was 41-50 years, 10(20%). Another study was done by Alhassan et al. [7] also concluded that elderly aged people were most commonly to have this disease. But adults also have this disease due to the habit of low intake of water. In this study, the most common site of kidney stones was right pelvic renal calculi. 15(30%) and the second most common location was the left pelvic kidney stone (17%) and the third most common location was the left upper pelvic junction 8(16%). This study reveals that the most common stones are present in the right kidney than the left kidney. A study done Babiker [25] also concluded that kidney stones most commonly occurred in the right kidney. In this study, the size of stone in most of the

patients 16(32%) range from 50-100mm and 7(14%) patients have a stone size of 101-149mm. In most people, low intake of water was the most common reason for kidney stones. A previous study [26] also concluded that low intake of water was the main reason for kidney stones in most patients. This study was found that there is no correlation between location of stone and stone size just as explain in a previous study [7]. The current study also observed that kidney stones are also caused by high salt intake and also due to diabetes mellitus but the main reason was the low intake of water. In the current study and previous studies, the modality used to evaluate kidney stones was computed tomography.

CONCLUSION

It is concluded that CT KUB scan is useful in the diagnosis of kidney stones. The chances of getting renal stones increases with age. The size of kidney stones in most patients is 1-50mm. It is also concluded that male patients more commonly have kidney stones 28(56%) than females 22(44) %. Most of the renal stones are present in the right kidney than the left kidney. According to the findings, kidney stones are most commonly caused by low fluid intake and diabetes mellitus. The correlation between the location of kidney stone and size was significant and there is a moderate correlation between stone size and location.

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Original Article

A Study to Evaluate the Relationship of Estimated Fetal Weight and Actual Fetal Birth Weight Using Ultrasound

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ABSTRACT

Estimated fetus weight is an essential measurement used to predict the fetal health during pregnancy as it has a close correlation with fetal mortality. Low fetal weight can lead to IUGR and high fetal weight can lead to fetal and maternal complications. **Objective:** To assess the changes among Estimated fetus weight and Actual fetus weight after birth. **Methods:** This cross-sectional study was conducted in the obstetric and gynecological sector of tertiary care setup in Gujrat, Pakistan. The data was collected for the duration of 4 months from December 2021 to March 2022. Data was collected using a convenient sampling technique. A sample size of 169 patients was calculated using the mean from previous related published studies. A Toshiba ultrasound machine was used with a 3.5 MHz convex probe was used. Data analysis was done by SPSS version 20. Consent was taken from all the participating pregnant females. **Results:** In this study result mean of estimated fetal weight (g) in the 3rd trimester was 2690.72 ± 463.97 g the average of actual weight (g) gained after delivery was 2701.04 ± 483.24 g. The paired t-test shows no significant change in estimated fetus weight on ultrasound and actual fetus weight after birth. **Conclusion:** This study determined that estimated fetal weight can be measured using an advanced ultrasound machine which can be cost-effective. This study also concluded that the difference among estimated fetus weight and actual fetus weight after birth is not statistically significant.

INTRODUCTION

In the obstetric department, ultrasonography is commonly used for estimating fetal weight and the characteristics used to predict birth weight [1]. Multiple part parameters are more effective than standard parameters in estimating fetal weight [2,3]. Biparietal diameters (BPD), abdominal circumference (AC), and femur length are important metrics for determining fetus weight, with abdominal circumference being the most sensitive [4,5]. The fetal weight can be predicted by clinical examination but through ultrasound, it seems to be more effective [6]. Fetal weight assessment is a vital and ubiquitous part of antenatal care, both in the labor and delivery as well as in the treatment of complicated pregnancies and

observation of prenatal care [7,8]. The single most significant factor of newborn survivability is the infant's birth weight [9]. Less and high fetal weight at birth are implicated in the pathogenesis of neonatal problems during labor and the postpartum period [7]. Due to preterm birth and intrauterine growth restriction, low birth weight is related to increase chances of death and disability [10]. Dystocia of shoulder, upper limb injury, Muscles and skeletal injuries, and intrapartum hypoxia are all possible risks of vaginal birth for extremely large fetuses, while vaginal and floor of pelvic injuries, a higher frequency of surgical vaginal besides cesarean births, and post-delivery hemorrhage are among the maternal complications [11,12].

As fetal size grows, cephalopelvic imbalance becomes more common, resulting in a higher surgical vaginal birth and cesarean delivery for macrosomic fetuses than normal-sized pregnancies [12]. The ideal birth weight range is amidst 3000 and 4000 grams [8,13]. Neonatal weighing more than 4000g are referred to as "macrosomic." [14]. The adequate birth weight range is amidst 3000 and 3999g, and the birth weight range is amidst 2500g and 2999g is known to be inadequate or insufficient [15]. The low neonate weight denotes a weight of < 2500g [16]. The very low neonatal weight and severe low neonate weight indicate < 1500g and <1000g respectively are the last classification of low birth weight strata which include two supplementary and distinct categories [8,16]. Aside from the neonate gestational age and gender of the neonate, birth weight has a strong link to infant death and its aspects [16,17]. Lower neonatal weight as well as lower gestational age leads to an increase in death chances in the first year of life [18]. A problem may present with the placenta or fetus as the result of the too-small fetus [19]. It's possible that the woman can present with gestational diabetes if the fetus is too large [20]. Many formulas for ultrasonography estimated fetal weight have been published over the past 30 years [21,22]. The Hadlock and colleagues' w7x formulas, which were adopted for this study, are the most common formulas in the United States [23]. In the United Kingdom, Campbell and Wilkin w2x and Shepard w17x formula are used, while Merz w11x formula is used in Germany. All of the above-mentioned formulas are used in most ultrasonography each with a unique sign [8,24]. The obstetricians need to know about fetal weight when it comes to gravidity and parturition. To estimate fetus weight on ultrasound is key information for competent birth attendants to make decisions about the optimum path for the fetus delivery. This study aimed to determine the estimated fetus weight in the 3rd trimester on ultrasound and actual fetus weight after birth. This study will give information about the weight changes in estimated fetus weight on ultrasound and immediate actual fetus weight to reliability of weight diagnosed by ultrasound.

METHODS

This cross-sectional study was conducted in obstetric and Gynecological departments in a private setup in Gujrat, Pakistan. The study has been done for the duration of 4 months from December 2021 to March 2022. The sample size of 169 patients is calculated via a convenient sampling approach from the previous three related studies [5,8,25]. All the healthy pregnant females included and the females with one more problem like hypertension, hypotension, and diabetes were excluded. Consent was taken from all

participants before collecting data. Toshiba ultrasound machine with 3.5 MHz convex probe used to examine patients with ultrasound gel. The participants were lying in a supine position on the plane medical couch. The Statistical Software Version 20 (SPSS 20) was used for the analysis of data.

RESULTS

The sample size was 169 pregnant females, all the females contributed to the study (100%). In table 1 the mean age of females was (28.9 ± 4.66) along with the median age (28.0). The mean weight in kg of the female was (71.92 ± 5.67) with a median weight in kg (72.0). The mean number of parity was ($1.4 \pm .97$) and the median of accouchement (was 2.0). The maximum maternal age was 40 and the minimum age was 20 with the range of 20 years' age. The maximum maternal weight (kg) was 84 and the minimum weight (kg) was 62. The maximum parity of the females was 4 along with minimum parity of 0 and a range of 4. The mean of the estimated fetus weight (g) in the 3rd trimester was (2690.72 ± 463.97) along with the median (2671.0g). The mean of the actual fetus weight after immediate birth was (2701.04 ± 483.24) along with the median (2677.0g). The maximum estimated fetus weight (g) was (4313.00g) and the minimum (1257g). The maximum actual fetus weight (g) after birth was (4722.0g) along with a minimum weight (g) of (1267g). In table 3: To assess the impact of the estimated fetus weight during in 3rd trimester (weight calculated by ultrasound using Hadlock formula) and immediately after birth a paired sample t-test was performed. The result showed, that the difference amidst estimated fetus weight and actual fetus weight after birth statistically is not significant $p = 0.000$ (two-tailed). The mean increase in the test score was -10.32544 ranging from -22.05032 to 1.39943 along with a 95% confidence interval. Figure 1 shows the correlation between estimated fetal weight on ultrasound in the 3rd trimester of pregnancy and the actual fetal weight at immediate birth. Measuring fetal weight on ultrasound reveals a positive correlation ($r = 0.975$) with the actual fetus weight after immediate birth. So, it's statistically stated that a linear positive relationship is present amidst estimated fetal weight on ultrasound and actual weight after immediate birth of the fetus.

Population vital statistic				
		Maternal age (yrs)	Maternal weight (Kg)	Parity
N	Valid	169	169	169
	Missing	0	0	0
	Mean	28.9645	71.9231	1.443
	Median	28.0000	72.0000	82.0000
	SD	4.66738	5.67786	.97503
	Range	20.00	22.00	4.00
	Minimum	20.00	62.00	.00
	Maximum	40.00	84.00	4.00

Table 1: Population vital statistic

Population vital statistic			
		Estimated fetus weight(g) in 3rd trimester	Actual fetus weight(g) after birth
N	Valid	169	169
	Missing	0	0
	Mean	2690.7219	2701.0473
	Median	2671.0000	2677.0000
	SD	463.97212	483.24908
	Range	3056.00	3455.00
	Minimum	1257.00	1267.00
	Maximum	4313.00	4722.00

Table 2: Comparison of estimated fetus weight on ultrasound and actual weight of fetus after immediate birth

Paired Samples Test									
		Mean	SD	SE Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	Estimated fetus weight(g) in 3rd trimester - Actual fetus weight(g) after birth	10.32544	77.20825	5.93910	22.05032	1.39943	1.739	168	.084

Table 3: The comparison among estimated fetus weight on ultrasound and actual fetus weight at immediate birth (paired t-test)

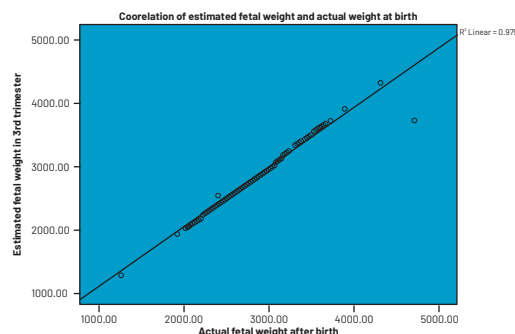


Figure 1: The correlation between estimated fetus weight on ultrasound and actual weight of fetus after immediate birth

DISCUSSION

Birth weight is an obligatory aspect of newborns for their good health, as it imitates the nutritive conditions of metabolism of the mother, and in the development of the fetus throughout pregnancy. According to the World Health Organization (WHO), birth weight is the initial estimation attained from the neonate after delivery which also concludes the arrangement of weight strata. The current study involves a total of 169 healthy pregnant females and was conducted for three months from January 2022 to March 2022; in a private gynecology and obstetrics setup in Gujrat, Pakistan using a Toshiba ultrasound machine along with a 3.5MHz probe. This study intends to evaluate estimated fetus weight in the 3rd trimester of pregnancy and actual fetus weight after immediate birth and to see changes in weight from the 3rd trimester to actual birth weight. Fetus weight cannot be estimated directly so it can be measured by the fetus and the maternal anatomical

attribute, the technique cast-off for this study to evaluate estimated fetus weight is ultrasound, the other method can use to estimate the fetal weight is clinical, Mohammad Wasim Awan (2015) also use this method in his study. Furthermost the average actual weight in this study was $2690.7219 \pm 463.97212g$ [25]; which was lesser than the $3,069.00 \pm 508.093g$ stated by Abdalla Mohamed Abdalla Albasha et al. (2020) which may be due to some socio or regional factors which may affect the fetus birth weight. The estimated fetus weight on ultrasound mean (2690.72 ± 463.97) and the actual birth weight (2701.04 ± 483.24) show no significant change in weight when both are compared [26]. A study was done by Ugwa et al. 2015 also confirmed this in his study and describe that ultrasonography is comparable with clinical weight for the prediction of fetal weight [27]. Fetal weight is important for the delivery mode because it can cause a problem if the fetus is too large (macrosomic fetus). Macrosomic fetus weight will be high and if vaginal delivery is done in this case it can cause complications in newborns like shoulder dystocia, brachial plexus injuries, bony injuries, and intrapartum asphyxia. These complications were also concluded by the study of Mohammad Wasim Awan (2015) [25]. The Hadlock formula which used in this study for the estimation of fetus weight using ultrasound was close to the actual fetus weight after birth which proved that Hadlock is accurate in the measurement of estimated fetal weight. A study was done by Ruby Yadav (2016) also stated this in her study. In the current study, the relationship coefficient for the method of ultrasound in comparison to the actual birth weight was (+0.975), which correlated positively with the actual neonate weight. In their evaluation of ultrasonic estimate, the relationship coefficient for ultrasonography estimation is equivalent to a minor difference (=0.64).

CONCLUSION

This study concluded that the findings of this study have significant insinuations for emerging countries, where is a scarcity of innovative ultrasound machines technology which are accomplished some unique functions but may be cost-effective. This study also concluded that no statistically significant difference among estimated fetus weight on ultrasound and actual weight of fetus after immediate birth. Therefore, it can be an unswerving way the prediction of baby's health and also confirmed the path of delivery in approximate cases.

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Original Article

Disc Prolapses In The Spine on Magnetic Resonance Imaging

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ABSTRACT

A disc herniation occurs when the nucleus, cartilage, or fragmented annular tissue are displaced outside the intervertebral disc area. Because of its high sensitivity and specificity for disc herniations, MRI is the method of choice for assessing disc morphology (both protrusions and extrusion). **Objective:** To use MRI to diagnose disc disorders, to create optimal MRI sequences for diagnosing spine pathologies, to detect which gender was affected, and to correlate the spinal disc with patient age. **Methods:** It was a descriptive cross-sectional study carried out in a DHQ Hospital, Gujranwala, Pakistan and the sample size for this research was 71 calculated via a convenient sampling approach. The data were collected in four months from December 2021 to March 2022 after informed consent. Patients who presented to the MRI department for spinal disc prolapse were included in this study. Patients were to be registered with age, gender, type of examination, and protocol used. An MRI scanner was made by a Japanese manufacturer (Toshiba). Data were analyzed using SPSS version 20. Results: Disc prolapse is widespread in older patients, with an average age of 41-50 years. Males are more likely than females to have disc prolapses 45(63.4 %). In approximately 50(70.4%) of patients, the sagittal and axial technique is the best for confirming disc prolapse. Lower back discomfort is the most prevalent complaint among patients. Conclusion: Disc prolapse is widespread in older male individuals. The sagittal and axial technique is the best for confirming disc prolapse. Lower back discomfort is the most prevalent complaint among patients.

INTRODUCTION

The disc line connects the end borders of the bone components that make up the spine (vertebrae) [1]. They feature a soft middle and a rigid outer ring that allows the spine to move freely while acting as a shock absorber [2]. The spinal canal is connected to the nerves that extend from the central nervous system to the extremities [3]. Nerves exit the spine and travel to the muscles and skin passes very close to the disc's back [4]. When the soft center of a disc is injured, it may prolapse, enabling nerves to pass through [5]. The most prevalent locations for such prolapses are the lower back (lumbar) and the neck (cervical) [6]. A herniated disc is defined as a restricted dislocation of a nucleus, cartilage, fragmented apophyseal bone, or fragmentary annular tissue outside the intervertebral disc area, according to the American Society of Spine Radiology and the American Society of

Neuroradiology [7]. A protruding disc is distinguished from a ruptured disc by the presence of disc tissue diffusely (> 50 percent of the diameter) extending further than ring apophyses' borders [8]. This protrusion could be either symmetrical or asymmetrical. Protrusions and extrusions are two types of herniations [9]. If the gap between the margins of the disc material outside of the disc space in any plane is less than the gap between edges of the base in the same plane, there seems to be a protrusion [10,11]. In any plane, extrusion arises when the maximal gap between the disc's edges surpasses the gap between both the base's margins [12]. The aging process, trauma, and other causes cause intervertebral discs to degenerate as a result of a decrease in oxygen and nutrition availability [13]. The intervertebral discs are supplied with nutrients via vertebral endplates [14]. As a result, endplate alterations

may occur concurrently with or even before disc degradation [15,16]. Because MRI has a greater precision (61-100%) and accuracy (42-96%) for disc herniations, it is the preferred method for assessing disc structure [17]. In this case, the presence of either a protrusion or an extrusion was a positive test, with the reference standard typically consisting of an expert prevailing opinion panel using an amalgamation of different information, based on availability, including medical knowledge, other diagnostics such as myelography, and surgical findings, with the reference standard typically consisting of an expert consensus panel using an amalgamation of various data, including medical knowledge, other diagnostics such as myelography, and surgical outcomes [18]. The use of MRI in the diagnosis and treatment of musculoskeletal disorders has opened up many opportunities [19]. It reveals anomalies in the bones and soft tissue before other imaging modalities can detect them [20]. MRI is notably efficient for detecting and assessing ligament (e.g. sprain), tendon (tendonitis, rupture, dislocation), and other soft tissue structures due to its better soft-tissue contrast resolution, noninvasive nature, and multi planner capabilities (e.g. sinuses tarsal syndrome, synovial disorders). In the diagnosis and staging of a variety of musculoskeletal infections, such as cellulitis and osteomyelitis, MRI has also been shown to be very sensitive [16,21]. In addition, MRI is highly sensitive in the identification and staging of a variety of musculoskeletal infections, such as cellulitis and osteomyelitis [22]. MRI can also be used to detect and assess a variety of osseous abnormalities, including bone contusions, stress and insufficiency fractures, osteochondral fractures, osteonecrosis, and transitory bone marrow edema [4,23]. The vertebral endplates and intervertebral discs are visible on T1- and T2-weighted sagittal and axial MR images [24]. The outer portion of the annulus, which has more fibrous tissue (low signal), contrasts well with the inner part of the annulus and the nucleus pulposus, which has greater water content, in T2-weighted images (high signal) [25]. The goal of the study was to use MRI to diagnose disc disorders, to create optimal MRI sequences for diagnosing spine pathologies, to develop a connection between the patient's age and the spinal disc, and to determine which gender was afflicted. As a greater proportion of persons with disc prolapse in the lumbar spine are being referred to the MRI section for assessment. This study enables the physicians to timely diagnose and manage the disc prolapse and avoid serious complications.

METHODS

It was a descriptive cross-sectional study carried out in a DHQ Hospital, Gujranwala, Pakistan and the sample size for

this research was 71 calculated via a convenient sampling approach [16,15,4]. The data were collected in four months from December 2021 to March 2022 after informed consent. Patients who presented to the MRI department for spinal disc prolapse were included in this study. Patients were to be registered with age, gender, type of examination, and protocol used. An MRI scanner was made by a Japanese manufacturer (Toshiba). Data were analysed using SPSS version 20.

RESULTS

Age, gender, and technique employed were all examined on the MR images of 71 patients. Table 1 shows the frequency distribution of age groups. There were 2 patients (2.8%) whose ages are less than 30, 3 patients (4.2%) had ages between 30-40, 38 patients (53.5%) had ages between 41-50, 15 patients (21.1%) had ages between 51-60 and 13 patients (17.4%) had ages between 61-70. Table 2 shows the frequency and percentage of the gender of patients. According to table 2, 45 (63.4 %) patients were males and 26 (36.6 %) were females. According to table 3, 21 (29.6 %) patients were scanned using the Coronal plane and 50 (70.4 %) patients were scanned using the Axial and sagittal plane. Table 4 shows that the majority of patients 43 (60.6%) with lumbar spine issues have LBP, 20 patients (28.2%) have LBP with sciatica, and 7 patients (9.9%) were suffering from sciatica and only 1 (1.4%) have localized hip pain.

Age (yrs)	Frequency	Percentage
<30 years	2	2.8
30-40 years	3	4.2
41-50 years	38	53.5
51-60 years	15	21.1
61-70 years	13	17.4
Total	71	100

Table 1: The frequency distribution of age groups.

Gender	Frequency	Percentage
Male	45	63.4
Female	26	36.6
Total	71	100

Table 2: Frequency and percentage of Gender of patients

Protocol used	Frequency	Percentage
Coronal	21	29.6
Axial and Sagittal	50	70.4
Total	71	100

Table 3: Frequencies of protocols

Presenting complaints	Frequency	Percentage
LBP	43	60.6
Sciatica	7	9.9
Hip pain	1	1.4
LBP with Sciatica	20	28.2
Total	71	100

Table 4: Indications or presenting complains

DISCUSSION

A herniated disc happens when the nucleus, cartilage, fractured apophyseal bone, or fragmented annular tissue protrudes from the intervertebral site. A cross-sectional study was conducted at a DHQ Hospital, Gujranwala on 71 patients who presented to the MRI department for spinal disc prolapse. Patients were to be registered with age, gender, type of examination, and protocol used. In the current study, there were 2 patients (2.8%) whose ages are less than 30, 3 patients (4.2%) have ages between 30-40, 38 patients (53.5%) have ages between 41-50, 15 patients (21.1%) having ages between 51-60 and 13 patients (17.4%) have ages between 61-70. Disc prolapse is widespread in older patients as stated by Hassan et al study published in 2016. A previously published study by Saad et al in 2018 shows similar results that disc prolapse is more common in older patients. In the current study, 45 (63.4 %) patients were male and 26 (36.6 %) were females [4]. Disc prolapse is widespread in males as declared by Abdalrahim et al in 2018 [16]. In the current study, 21 (29.6 %) patients were scanned using a coronal plane and 50 (70.4 %) patients were scanned using an axial and sagittal plane. The sagittal and axial technique is the best for confirming disc prolapse as declared by previously published studies by Saad et al in 2018 [4] and Hassan et al in 2016 [15]. The present study shows that the majority of patients 43 (60.6%) with lumbar spine issues have LBP, 20 patients (28.2%) have LBP with sciatica, and 7 patients (9.9%) were suffering from sciatica and only 1 (1.4%) have localized hip pain.

CONCLUSION

MRI is a useful tool for detecting disc prolapse in the lumbar vertebrae. As it recognizes structurally how the spinal cord is pinched and represents clinical manifestations inside the spinal cord by revealing a variation in spinal cord signal intensity. MRI has become an intriguing technique for a secure, highly reliable, and cost-effective evaluation of the vertebral column. Disc prolapse is widespread in older male individuals. The sagittal and axial technique is the best for confirming disc prolapse. Lower back discomfort is the most prevalent complaint among patients.

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Original Article

Assessment of High-Risk Pregnancies using Biophysical Profile

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ABSTRACT

Objective: The purpose of the current study was to know the importance of using BPP for primary fetal surveillance in predicting fetal outcome. **Methods:** A total of 70 individuals with high risk pregnancies were included from 16-45 years examined through ultrasound and Doppler (Toshiba Xario 100 colour Doppler (C5-2 convex probe) having a real-time frequency range of 3.0 to 5.0 MHZ) at a private hospital in Gujranwala from October 2021 to March 2022. A Convenient sampling approach was used to collect data through informed consent forms. Data was collected using SPSS 21. **Results:** The current study included 70 patients who were examined using Doppler for fetal well-being. Study concluded to have correlation between age groups and development of fetal anomalies of age group 16-25years 44(62.9%), 26-35 years 21(30.0%), 36-45 years (7.1%). Most of the females in gestational weeks 34-37 weeks. Frequency of high-risk pregnancy most common is hypertension 25(35.7%) followed by other such as low fetal movement 10(14.3%), oligohydramnios 8(11.4%) and the least common is diabetes mellitus. Reactive 50(71.4%), and non-reactive 20(28.6%). Result shows the frequency of biophysical profile score in total number of patients included. Biophysical profile score 0-2 in 16(22.9%), 4-6 BPP score in 42(66%) and 8-10 BPP in 12(17.1%) patients. The frequency of IUGR in relation to biophysical profile score showing 18(72.0%), in 0-2 BPP score and 7(28%) in 4-6 BPP score. **Conclusions:** Normal BPP assures good fetal status and perinatal outcome. Abnormal BPP indicates that the fetus may be compromised. The study concluded that BPP has significant role in predicting fetal outcome.

INTRODUCTION

It is widely known that no health issue is more essential for a nation than maternal and perinatal mortality [1]. The field of obstetrics has progressed dramatically since the days when 'delivery' referred to the delivery of the infant only rather than its whole health [2]. Caesarean section was then thought to be risky, if not lethal [3]. With the passage of time, however, more attention is being paid to the well-being and result of the fetus, as well as a safe and concise birth [4]. High-risk pregnancies account for around a quarter to a third of all pregnancies, and they most likely to result in fetal morbidity and fatality [5]. The high-risk pregnancies must be recognized so that appropriate surveillance and prompt interventions can be implemented, reducing perinatal morbidity and mortality [6]. The mother's hypertensive problems are responsible

for the majority of them [7]. The most common multisystem illness during pregnancy is preeclampsia which can cause hypertension, reduced amniotic fluid, maternal abnormal findings, intrauterine growth restriction, or impaired fetal growth [8]. This accounts for approximately 6-10% of all pregnancies. Preterm births account for around 20% of them [9]. Every year, over 7.3 million perinatal fatalities occur worldwide, the majority of which occur in Asia [10]. In 2020, Pakistan's neonatal death rate was around 58.60 mortalities per 1,000 births [11]. The overall neonatal death rate was found to be 111.1 percent (per 1000 births). In comparison to urban regions (93.3), it was higher in rural areas (121.2) [12]. Preeclampsia (gestational age < 37 weeks) complicate 0.5-1.6 percent and severe preeclampsia (gestational age < 35 weeks)

complicate 0.4 percent of pregnancies [13]. Women who have had preeclampsia before, as well as those who have diabetes, chronic hypertension, or a multi-fetal pregnancy, have a higher risk of premature preeclampsia [14]. In such high-risk circumstances, The biophysical profile of fetus is among the most widely used procedures for assessing the health of a fetus [15]. Manning et al. described the initial biophysical profile, which included a study of five factors: respiratory activity, fetal tone, fetal body movement, amniotic fluid index, and non-stress test [16]. This includes two phases i.e. ultrasonographic examination as well as Doppler to measure the fetal cardiac activity. The importance of high-resolution dynamic ultrasonographic imaging in advancement of fetal medicine cannot be underestimated [17]. The ability to "visualize" the fetus and its environment, as well as monitor fetal actions and responses to intrinsic and extrinsic stimuli, fundamentally transforms the factual and psychologic basis of fetal medicine practice [18]. With this technological advancement comes a better understanding of disease and the ability to treat and, in some circumstances, cure it. Another fundamental concept is that, on a larger scale, our ability to reliably classify fetal responses to potentially harmful maternal illness states (such as hypertension) is improving our understanding of how maternal health affects fetal health [19]. A separate non-stress examination of the fetal heart rate can be conducted as the part of BPP. Each of the five ultrasonography parameters, as well as the non-stress test, is given a score of 0 or 2. (there is no 1 point) [20]. A total score of 8 indicates appropriate prenatal oxygen levels and acid-base balance, as well as a well-perfused and oxygenated fetal brain, whereas a score of 4 indicates fetal impairment [21]. If a compromised fetus is identified, the physician should be able to perform measures to prevent negative fetal/neonatal outcomes [22]. High risk pregnancies has quite high mortality rate and needs early detection to prevent loss at any greater level. Assessment as biophysical profile of the fetus is one of the best methods to evaluate fetal health. Ultrasound plays important role in early detection and management of any pregnancy related complications. It is a non-ionizing, non-invasive modality with minimal effect on tissues of the body and most preferable diagnostic modality in high risk pregnancies.

METHODS

Total 70 individuals with high risk pregnancies were included from 16-45 years examined through ultrasound and Doppler (Toshiba Xario 100 colour Doppler (C5-2 convex probe) having a real-time frequency range of 3.0 to 5.0 MHZ) at a private hospital in Gujranwala from October 2021 to March 2022. Women with high risk pregnancies of age

group 16-45 year were included. A consent form was taken from all the patients for data collection. The test assesses the baby's cardiac activity, respiration activity, movements, muscle tone, and amniotic fluid level by combining fetal heart rate monitoring (non-stress test) and ultrasound of fetus. After the complete evaluation, a score is assigned to the non-stress test and ultrasound measurements based on whether or not specified criteria are met. The results are referred to as reactive if the baby's heartbeat accelerates to a certain level above the baseline twice or more than 10 seconds per 20-minute time interval before 32 weeks of pregnancy (normal). If the baby's heartbeat does not fulfil the criteria listed above, the results are called non-reactive. The fetus is maybe inactive or asleep during the test due to which it gives non-reactive result.

RESULTS

The current study included 70 patients who were examined using Doppler for fetal well-being. Table 1 shows that the age groups of mothers: 16-25 years 44(62.9%), 26-35 years 21(30.0%), 36-45 years (7.1%) and the gestational age in weeks. Most of the females in gestational weeks 34-37 weeks 26(37.1%). 20(28.6%) were from gestational age 30-33 weeks. 16(22.9%) were from gestational age 38-41 weeks. Only 8(11.4%) were from gestational age 42-45 weeks. Table 2 shows the amniotic fluid result including 48(68.6%) >6cm, 16(22.9%) 3-6cm and 6(8.6%) in <3cm. Table 2 also shows the weight of fetus including 40(57.1%) 2.4-3.4kgs, 25(35.7%) 1.4-2.4kgs, 4(5.7%) <1.4kg and only 1(1.4%) >3.4kgs. Reactive 50(71.4%), and non-reactive 20(28.6%) stress test is shown in table 2. The frequency of high-risk pregnancy in which the most common is hypertension 25(35.7%) followed by other such as low fetal movement 10(14.3%), bad Obstetric history 10(14.3%), Oligohydramnios 8(11.4%) and the least common is diabetes mellitus and hypothyroidism 1(1.4%) (Table 3). Table 4 shows the frequency of biophysical profile score in total number of patients included. Showing biophysical profile score 0-2 in 16(22.9%), 4-6 BPP score in 42(66%) and 8-10 BPP in 12(17.1%) patients, the frequency of IUGR in relation to biophysical profile score showing 18(72.0%), in 0-2 BPP score and 7(28%) in 4-6 BPP score.

Age groups of mothers			
Valid	Frequency(%)	Valid%	Cumulative %
16-25years	44(62.9)	62.9	62.9
26-35years	21(30.0)	30.0	92.9
36-45years	5(7.1)	7.1	100.0
Total	70(100.0)	100.0	
Gestational age in weeks			
Valid	Frequency(%)	Valid%	Cumulative %
	30-33weeks (20)	28.6	28.6
	34-37weeks (26)	37.1	65.7
	38-41weeks (16)	22.9	88.6
	42-45weeks (8)	11.4	100.0
	Total (70)	100.0	

Table 1: Age groups of mothers in years and their gestational age in weeks

Amniotic fluid Index test			
Valid	Frequency(%)	Valid%	Cumulative %
>6cms	48 (68.6)	68.6	68.6
3-6cms	16(22.9)	22.9	91.4
<3cms	6(8.6)	8.6	100.0
Total	70(100.0)	100.0	
Weight of fetus in kgs			
Valid	Frequency(%)	Valid%	Cumulative %
	<1.4(4)	5.7	5.7
	1.4-2.4 (25)	35.7	41.4
	2.4-3.4(40)	57.1	98.6
	>3.4(1)	1.4	100.0
	Total(70)	100.0	
Non- stress test results			
Valid	Frequency(%)	Valid%	Cumulative %
	Reactive (50)	71.4	71.4
	Non- reactive (20)	28.6	100.0
	Total (70)	100.0	

Table 2: Amniotic fluid Index test results, weight of fetus and Non-stress test results

Amniotic fluid Index test			
Valid	Frequency(%)	Valid%	Cumulative %
	Hypertension (25)(10)	35.7	35.7
	Low Fetal Movement (10)	14.3	50.0
	Polyhydramnios (2)	2.9	52.9
	Bad Obstetric History (10)	14.3	67.1
	Diabetes Mellitus (1)	1.4	68.6
	Hypothyroidism (1)	1.4	70.0
	Placental Abruption (2)	2.9	72.9
	Placenta Previa (3)	4.3	77.1
	Obesity (3)	4.3	81.4
	Multiple Pregnancies (2)	2.9	84.3
	Oligohydramnios (8)	11.4	95.7
	PCOS (3)	4.3	100.0
	Total (70)	100.0	

Table 3: Risk factors of high-risk pregnancies

Fetal outcome			
Biophysical profile score	IUGR	Still Birth	
0-2	16(22.9)	18(72.0)	3(75.0)
4-6	42(60.0)	7(28.0)	1(25.0)
8-10	12(17.1)	0(0)	0(0)
Total	70(100.0)	25(100)	4(100)
IUGR			
Valid	Frequency(%)	Valid%	Cumulative %
0-2	16(22.9)	22.9	22.9
4-6	42(60.0)	60.0	82.9
8-10	12(17.1)	17.1	100.0
Total	70(100.0)	100.0	

Biophysical profile score			
Valid	Frequency(%)	Valid%	Cumulative %
0-2	18(72.0)	72.0	72.0
4-6	7(28.0)	28.0	100.0
Total	25(100.0)	100.0	

Table 4: Fetal outcome, IUGR and Biophysical profile score

DISCUSSION

The primary goal of fetal surveillance during pregnancy is to identify any possible harmful factors that could result in fetal morbidity and mortality. The best approach for identifying the fetus at risk is the biophysical profile using Doppler. Every year, over 7.3 million perinatal fatalities occur internationally, the majority of which occur in Asia. In 2020, Pakistan's neonatal death rate was around 58.60 mortalities per 1,000 births. Total 70 high risk pregnant patients were considered into current study. The age groups included were 16-25y, 26-35y and 36-45y. Fetal respiratory motions, body movements, fetal tone, cardiac activity, and amniotic fluid volume were the five characteristics taken into consideration. Each parameter was given a score of 2 for a normal reading and a score of 0 for abnormal. Maximum four procedures were performed on a single patient. The study concluded that there is a significant relationship between age groups and risk of high pregnancies showing that age 16-25y have more tendency to fetal anomalies 44(22.9%) followed by 26-35 years 21(30.0%), 36-45 years (7.1%). Further results show that there is a relationship between gestational weeks and incidence of high-risk pregnancies. Most common in 34-37 weeks 26(37.1%) followed by 20(28.6%) in 30-33weeks, 16(22.9%) in 38-41weeks and only 8(11.4%) in 42-45weeks. In addition, current study shows that amniotic fluid index has correlation with high risk pregnancies 48(68.6) % >6cm, 16(22.9) 3-6cm and 6(8.6%) in <3cm. The current study shows no as such relation with fetus weight to high risk pregnancy, including 40(57.1%) 2.4-3.4kgs, 25(35.7%) 1.4-2.4kgs, 4(5.7%) <1.4kg and only 1(1.4%) >3.4kgs. The study shows that the most common risk factor for high risk pregnancy is hypertension 25(35.7%) followed by other such as low fetal movement 10(14.3%), bad obstetric history 10(14.3%), oligohydramnios 8(11.4%) and the least common is diabetes mellitus and hypothyroidism 1(1.4%). A study by Dr. K. P. SOWMYA in 2010 also stated almost the same frequency of preeclampsia 26(37.14%), low fetal movement 9(12.6%), the ones with oligohydramnios 5(7.13%). Hypothyroidism and diabetes mellitus were found in 1(1.4%) patients. Further the study shows significance relation between biophysical profile score and high-risk pregnancy showing maximum patients in range 4-6 BPP score 42(60.0%) followed by 16(22.9%) patients in 0-2 BPP score [25]. In addition to this the current study shows quite significant relation between BPP score and IUGR 18(72.0%) in 0-2 BPP score, 7(28%) in 4-6 BPP score relatively.

CONCLUSION

In conclusion, normal BPP assures good fetal status and perinatal outcome. At the same time, abnormal BPP indicates that fetus could be compromised. As a primary antepartum fetal monitoring test BPP was significantly used in high risk pregnancy patients from age 16-45 years. The current study shows significance relation between biophysical profile score and high-risk pregnancy, 4-6 BPP score 42(60.0%) followed by 16(22.9%) patients in 0-2 BPP score. It also shows quite significant relation between BPP score and IUGR 18(72.0%) in 0-2 BPP score, 7(28%) in 4-6 BPP score relatively.

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Original Article

Evaluation of Normal Spleen Volume using Ultrasonography

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ABSTRACT

The largest organ in the abdomen is the spleen, also called the lymphoid organ. Its major function is to purify the blood and provide immunity. **Objective:** To evaluate and measure normal splenic volume on ultrasound. **Methods:** A cross-sectional study was conducted at the radiology department of Gujranwala, Pakistan. A sample size of 150 participants was taken from previously published articles from January 2022 to March 2022. The sample size was taken with the inclusion of normal healthy adults and exclusion of splenomegaly after informed consent. TOSHIBA ultrasound equipment was used with a convex transducer having a frequency of 3.5MHz. The data was entered and analyzed using SPSS version 22. **Results:** The results show that most participants were between the age of 30 to 39 years 55(36.7%). The female participants 94(62.7%) were more than the males 56(37.3%). The length, width, and thickness of the spleen are shown in the tables respectively. The splenic volume seems to be 174cm³ in most participants. **Conclusion:** Ultrasound is the most accurate, cheap, portable, and easily available modality for measuring spleen volume, which can be measured by using different approaches.

INTRODUCTION

One of the largest organs in the abdomen is the spleen, also called the lymphoid organ [1, 2]. It is located in the left hypochondriac region, between the left kidney and hemidiaphragm. It is a soft, purple, triangular/circular, and friable organ with very smooth surfaces. Spleen varies in size from person to person. Normally, its length is 12cm, width is 7cm and thickness is about 5cm. The weight of the spleen is approximately 150grams [3, 4]. About 100% population has a length of kidney below 12cm which ranges 7-11cm. The size of the spleen decreases as age increases while there is no effect of the weight and gender on spleen size [5, 6]. Spleen is an important organ in the human body that protects against bacteria, fungi, and some other blood-borne pathogens. Spleen is generally composed of two parts, the white pulp includes three areas named per

arteriolar lymphoid sheaths, lymph follicles, and marginal zone which contribute 25% of the spleen. On the other hand, red pulp helps to form cords and sinus of the spleen with help of lymphocytes, contributing 75% to the spleen. Two major functions of the spleen are providing immunity and purifying blood [7, 8]. Spleen filters almost 150ml of blood/minute. Spleen is supplied by surrounding collaterals of different organs and the splenic artery [9, 10]. Some variations are also common in the spleen. These variations are named as, poly-splenia, hyposplenia, lobulated spleen, accessory spleen, accessory nodules of the spleen, etc [11]. Accessory spleen also called the supra-numerary spleen or splenule is a condition in which a splenic tissue, separated from the spleen is noted outside the normal The accessory spleen is noted in 10%-40% of the total



population [12, 13]. In polysplenia, multiple, small parts of accessory spleens are attached with a normal, full-sized spleen [14]. Some other conditions including trauma, splenomegaly, focal lesions in the spleen, infarction, tumors, and congenital abnormalities are also common pathologies of the spleen in the human body [15, 16]. The volume of the spleen can be measured by using many techniques including radiography, CT, MRI, scintigraphy, and ultrasonography [17]. Ultrasound is one of the most common modalities used to measure splenic index. Ultrasound use sound waves that are non-ionizing radiations and a convex probe of 3.5MHz. It is a safe, noninvasive, cheap, easily available, and fast modality for diagnosing spleen pathologies. The volume of the spleen can be measured by using a formula, written as (length × width × depth × 0.523), called splenic index. The volume of the spleen can be measured in two ways. One is by length which is taken in the longitudinal plane and the other is width taken in the transverse plane [18, 19]. Moreover, in emergency conditions, ultrasound is the first-line tool to assess splenic rupture and other conditions [20, 21]. One unique modality of ultrasound called Color Doppler can also be used to assess vasculature abnormalities of the spleen [22,23]. One technique used to visualize crescent shape spleen is to use the left kidney as a window. The probe is placed on the left midline of the patient and the left kidney is detected, appearing oval. An anechoic area seen on greyscale ultrasonography shows the vessels of the spleen having an echoic thin capsule [24,25]. Ultrasound is the most accurate, cheap, portable, and easily available modality for measuring spleen volume which can be measured by using different approaches. People can undergo this easily as it is not expensive.

METHODS

A cross-sectional study was conducted at the radiology department of Gujranwala, Pakistan. A sample size of 150 participants for 3 months from January 2022 to March 2022 was taken from previously published article with the inclusion of normal healthy adults and exclusion of splenomegaly. Data were collected from the participants after informed consent. TOSHIBA was used with a convex transducer having a frequency of 3.5MHz. The data were analyzed using SPSS version 22.0. Data were entered and analyzed using SPSS version 7 via tables and bar charts.

RESULTS

A total number of 150 participants with the inclusion of normal healthy adults and exclusion of splenomegaly were taken in the study. Table 1 shows the age of participants categorized into subgroup as 20-29 41(27.3%), 30-39 55(36.7%), 40-49 33(22%) and lastly 50-59 21(14%). The highest frequency of age groups was between 30 to

39years 55(36.7%).

Age Of Participants				
	Frequency	Percent	Valid Percent	Cumulative Percent
20-29	41	27.3	27.3	27.3
30-39	55	36.7	36.7	64.0
40-49	33	22.0	22.0	86.0
50-59	21	14.0	14.0	100.0
Total	150	100.0	100.0	

Table 1: Age of Participants

Table 2 shows the gender of participants in which 56 (37.3%) are male and 94 (62.7%) are female.

Gender of Patients				
	Frequency	Percent	Valid Percent	Cumulative Percent
Female	94	62.7	62.7	62.7
Male	56	37.3	37.3	100.0
Total	150	100.0	100.0	

Table 2: Gender of Participants

Table 3 shows the length of the spleen in all participants ranging from 7cm to 12cm. Most of the participants were having spleen length of 12cm 62(41.3%), followed by 11cm 48(32%), 9cm 22(14.7%), and 8cm 18(12%). Most common spleen width was noted to be 7cm 72(48%), followed by 6.4cm 56(37.3%), and 6.9cm 22 (14.7%). The highest thickness was 5cm 100(66.7%). Out of 150 participants, 64(42.7%) were having a splenic volume of 174cm³, Table 3.

Gender of Patients			
Parameter		Frequency	Percent
Length of Spleen	12cm	62	41.3
	11cm	48	32.0
	8cm	18	12.0
	9cm	22	14.7
	Total	150	100.0
Width Of Spleen	7cm	72	48.0
	6.4cm	56	37.3
	6.9cm	22	14.7
	Total	150	100.0
Thickness Of Spleen	5cm	100	66.7
	3cm	18	12.0
	3.9cm	32	21.3
	Total	150	100.0
Volume Of Spleen	155	27	18.0
	153	32	21.3
	147	27	18.0
	174	64	42.7
	Total	150	100.0

Table 3: Parameters of Spleen among participants

DISCUSSION

Ultrasound is one of the most common modalities used to measure splenic index. Ultrasound use sound waves that are non-ionizing radiations and a convex probe of 3.5MHz. It is a safe, noninvasive, cheap, easily available, and fast modality for diagnosing spleen pathologies. A sample size of 150 participants was taken. One of the most common, cheap, easily available tools for measuring splenic volume is ultrasound. Ultrasound contains non-ionizing radiations that are not harmful to the patients. It is a noninvasive,

portable, less expensive, and easily affordable modality [21]. The current study proves that the splenic index is an accurate method for measuring splenic volume. Splenic index (SI) is the product of transverse width and the longitudinal length of the spleen which is measured in the cross sectional view of the image on ultrasound. Even with normal measurement, splenomegaly, abnormal vasculature, etc. can also be detected on ultrasonography. A study was done by Hiromi Ishibashi also has similar findings in which length, and width of the spleen was used to take the volume of the spleen [23]. In the current study, the splenic volume of all participants is calculated using the formula length x width x thickness x 0.524. This formula is best for calculating splenic volume accurately. Similar results were found by Çeliktas, M. in 2015. A study conducted by Stylianos D. Megremis in 2004 also concluded that ultrasound is useful tool for measuring splenic length, width, a thickness that can be calculated using the formula from which splenic volume can be measured accurately. In a previous study, one hundred and fifty participants with normal spleen were taken to rule out the accuracy of the formula [6].

CONCLUSION

Ultrasound is the most accurate, cheap, portable, and easily available modality for measuring spleen volume which can be measured by using different approaches. People can undergo this easily as it is not expensive.

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Original Article

Frequency of Brain Atrophy Diagnosed On Computed Tomography

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ABSTRACT

Brain atrophy is the loss of connections between neurons. It can be due to old age, trauma, ischemic stroke, multiple sclerosis, post infective and neurodegenerative diseases. **Objective:** To determine the frequency of brain atrophy on Computed Tomography. **Methods:** A cross sectional study conducted in Medcare international hospital, Gujranwala and DHQ, Kasur. The data was collected using convenient sampling technique from February 2022 to May 2022 after written consent. A sample size of 60 was calculated using mean from previous published studies. The age considered was maximum of 100 and minimum of 20 years. The study included all the patients who had focal and generalized brain atrophy. The equipment used for the evaluation was Toshiba Aquilion 64 slices CT scanner. **Results:** The mean age of patients was 79.88 ± 9.22 having minimum age of 57y and maximum age of 91y. The male patients were more frequent as 34(56.7%) and females as 26(43.3%). The brain atrophy was categorized as focal 14(23.3%) and generalized atrophy 46(76.7%). The patients of brain atrophy had history of smoking 30(39%), alcohol use 13(16.9%) and diabetes mellitus 15(19.5%) and the common symptoms include memory problems 25(33.3%), poor judgment 13(17.3%) and loss of language 11(14.7%). The most common cause of brain atrophy evaluated was due to old age 42(70%) following post traumatic 9(15%) and Alzheimer 4(6.7%). **Conclusion:** In conclusion, brain atrophy can be due to old age, trauma and Alzheimer disease. The common symptoms include memory problems and loss of language.

INTRODUCTION

The human brain is most complicated organ of human body lying in the cranial cavity. The brain consists of 100 billion connected nerves which are communicating altogether through trillions of synapses [1, 2]. A normal adult human brain weighs roughly 3 pounds and weighs between 1300 and 1400 grams and measures roughly 15 centimeters in length [3, 4]. The human brain is made up of around 100 billion neurons, which are a structural and functional unit of brain contains more than 100,000 kilometers of interconnections [5, 6]. These astounding figures have led to the conclusion that our cognitive skills are almost limitless [7]. The loss of neurons and decrease in connections between neurons is known as brain atrophy (cerebral atrophy) [8]. Cerebral palsy, dementia, and viral disorders are just a few of the ailments that induce brain shrinkage. The symptoms and degree of brain shrinkage

vary depending on the illness and the site of injury. Brain cells can be damaged and atrophy can result from injuries, disorders, and infections [9]. The trauma, diabetes and hypertension are two prevalent risk factors that have been linked to cognitive impairment in old age, hence the use of smoking and alcohol can also contribute in impairment due to brain atrophy [10]. Cerebral atrophy is a condition that affects all individuals especially in old age. However, a variety of factors can increase cell loss, including damage, infection, and medical diseases including dementia, stroke, and Huntington's disease [6]. These situations can occasionally result in more serious brain injury and can be life-threatening [11]. The signs and symptoms of brain atrophy differ in all individuals because it is depending on which part of the brain is affected and affects such as loss of memory, disturbed learning & abstract thinking, and

administrative functions all are affected by dementia and cognitive impairment [12]. The Symptoms of brain atrophy includes seizures which are eruptions of abnormal electrical activity in the brain. The signs involve sudden and repeated jerky movements, loss of consciousness and convulsions. In some cases some patients also experience aphasia, a condition in which people have difficulty speaking and understanding language. The different areas of the brain might be affected by atrophy [13, 14]. Focal atrophy: It is a condition that affects cells in specific parts of the brain, resulting in a loss of function in those areas. The focal cerebral atrophy can be due to history of ischemic injury and trauma. Hemorrhage and contusion can also cause focal atrophy in the specific site of brain affected. Some neurodegenerative diseases showing dementia and cognitive impairment are as Alzheimer disease, Pick disease, Parkinson disease, Huntington disease [15]. Generalized Atrophy: It is a condition in which brain cells all across the brain are affected. It can be due to increasing age, alcohol & drug use, end stage multiple sclerosis, post traumatic, post infective and some neurodegenerative diseases [16]. Normal brain ageing refers to age-related structural changes and function of the human brain that occurs in the general population but do not cause clinically significant impairments [17]. The shrinkage of brain happens in the specified sites; it doesn't get involved in every part of the brain. That is how it differs from focal and generalized atrophy. The brain shrink is likely to get worse with the age as you become older and some areas of the brain, while some parts of the brain may shrink more quickly than other. Due to this the parameters are used for the identification and measurement of brain atrophy [18]. The individual in the age of 30s or 40s the size of the brain starts to decline with increasing age. The shrinkage may accelerate more quickly after you reach 60 [19]. With Increasing age, the cerebral cortex become wrinkled outer and thins away [20]. All areas of the brain perform specific functions. The atrophy in specific area can have function disturbed as the frontal lobe controls the recalling of memory and emotions. The brain atrophy in frontal lobe can also affects control of impulses, skills of problem solving, ability of social interaction, and motor functional responses. A common site for atrophy is temporal lobe located behind the ears, which functions to interpret words to talk, how to read and write, and connection of words and their meanings, might also show signs of thinning [21]. The current study will imply that normal brain will result in brain atrophy with increasing age. The brain atrophy can occur due to aging, trauma, diabetes and neurodegenerative diseases such as Alzheimer, Parkinson, Pick's and Huntington disease which can impacts cognition and mental disturbance in older life. The study findings will

explain the clinical consequences of ischemic injury, brain neurodegeneration, and the onset of clinical symptoms of cognitive impairment followed by brain atrophy. This data will provide important clinical context for interpreting changes in brain size linked with age, trauma and other pathologies related with trauma.

METHODS

It was a Cross sectional study conducted in Medcare international hospital, Gujranwala, Pakistan. The data were collected using convenient sampling technique from February 2022 to May 2022 after informed and written consent. A sample size of 60 was calculated using mean from previous published studies [22-25]. The age group considered was maximum of 100 years and minimum of 20 years old. The study included all the patients who had focal atrophy due trauma, ischemic stroke, post infective and neurodegenerative diseases showing dementia and cognitive impairment due to as Alzheimer disease, Pick disease, Parkinson disease, Huntington disease. The study also included generalized atrophy due to increasing age, alcohol & drug use, end stage multiple sclerosis. The patients other than brain atrophy were excluded from the study. The equipment used for the evaluation was Toshiba Aquilion 64 slices CT scanner with Peak voltage 120kvp, 300mA, 64 detectors, 20-25 FOV, and 3 to 5 mm slice thickness. The soft tissue reconstruction was done on Kernel FC64, acquisition.

RESULTS

The results of current study were based on 60 patients. The age considered was maximum of 100 and minimum of 20 years old. The quantitative data age was calculated as descriptive statistics mean $\pm$ standard deviation, maximum, minimum and range. The qualitative data like gender frequency and percentage was calculated and displayed in the form of table and bar chart. The findings evaluated on Computed Tomography, signs and symptoms and risk factors are mentioned as frequency and percentage displayed in the form of tables and bar charts. The total of 60 patients were included in the study. The patients had minimum age of 57 years and maximum age of 91 with age range of 34. The mean age was 79.8 ± 9.2 . According to gender distribution males were most frequent having 34(56.7%) and females having frequency of 26(43.3%). The Table 1 shows the type of brain atrophy that patients were suffering in which the most common was generalized brain atrophy with 46(76.7%). The focal atrophy due to post trauma was 14(23.3%).

Type of brain atrophy	Frequency	Percent
Focal	14	23.3
Generalized	46	76.7
Total	60	100.0

Table 1: Frequency distribution of type of brain atrophy in patients

Table 2 shows that the patients of brain atrophy had history of smoking 30(39%), alcohol use 13(16.9%), diabetes mellitus 15(19.5%), neurodegenerative diseases 4(5.2%), infection 4(5.2%) and head injury 9(11.7%).

Risk factors of brain atrophy	Frequency	Percent
Genetic history of neuro- degenerative diseases	4	5.2
Head/ Brain injury	9	11.7
Infection	4	5.2
Alcohol use disorder	13	16.9
Diabetes mellitus	15	19.5
Smoking	30	39.0
Total	75	97.4
Total	77	100.0

Table 2: Frequency distribution of clinical history patients

Table 3 shows that the patients of brain atrophy had common symptoms such as Memory problems 25(33.3%), poor judgment 13(17.3%), loss of language 11(14.7%), mood and personality changes 10(13.3%) and seizures 7(9.3%).

Signs and symptoms of brain atrophy	Frequency	Percent
Hallucinations	9	12.0
Loss of language	11	14.7
Memory problems	25	33.3
Mood and personality changes	10	13.3
Poor judgment	13	17.3
seizures	7	9.3
Total	75	100.0

Table 3: Frequency distribution of signs and symptoms of brain atrophy in patients

Table 4 shows that the most common brain atrophy was due to old age 42(70%) following post traumatic 9(15%) and Alzheimer 4(6.7%).

Signs and symptoms of brain atrophy	Frequency	Percent
Age related brain atrophy	42	70.0
Post traumatic	9	15.0
Post infective	3	5.0
Multiple sclerosis	1	1.7
Alzheimer disease	4	6.7
Parkinson disease	1	1.7
Total	60	100.0

Table 6: Findings of brain atrophy on Computed tomography(CT)

DISCUSSION

The current study included all the patients who had focal atrophy due trauma, ischemic stroke, post infective and neurodegenerative diseases showing dementia and cognitive impairment due to Alzheimer disease, Pick disease, Parkinson disease, Huntington disease. The study also included generalized atrophy due to increasing age, alcohol & drug use, end stage multiple sclerosis. The current study found that the mean age of patients was 79.88 ± 9.22 which showing that the cerebral atrophy was commonly occurring in old age. Chrzan (2019) also found that brain atrophy was common in elder age up to 70 to 99 [24]. The previous study showed brain atrophy measures having significant differences amongst the age. After 40 years of age, the mean BVI fell statistically significantly. The loss of mental activity paralleled the progression of

brain shrinkage, which increased with age, trauma, and Alzheimer's disease. The previous literatures such as (Chrzan, 2019) evaluated the cause of brain atrophy as age related and due to trauma and neurodegenerative disease such as Alzheimer's disease [24]. The current study found the most common brain atrophy was due to old age 42(70%) following post traumatic 9(15%) and Alzheimer 4(6.7%). The current study has similar results with the previous literature which was evaluated on Computed Tomography having almost same protocols. Another study by Zahid (2015) found aging one of the most common factors linked to shrinkage of brain (atrophy) followed by Alzheimer disease and trauma [23]. The diagnoses of Alzheimer's disease, neuropathy, tumor, and alcoholism were all ruled out. The study used conventional Computed Tomography using Toshiba equipment in helical, using voltage of 120 kVp, the tube current of 300mA, and the slice thickness of 3 to 5mm. The use of alcohol and smoking was also reported in the current study as the patients with atrophy had history of smoking 30(39%) and alcohol use 13(16.9%). The age related brain atrophy is a progressive process that affects elder people much more than young. The current and previous studies used Computed tomography to evaluated brain. Cerebral atrophy can be detected using both CT and MRI. Literature shows that MRI could be a better modality for studying soft tissues structures. MRI became a natural choice for studying brain atrophy due to visualization of soft tissue structures but Computed Tomography is more routinely used in clinical practice due to availability and reliability. CT is used for nearly all emergency imaging in the developing world due to its quick evaluation. CT imaging is also commonly utilized in neurosurgery and neuro diagnosis because to its comparatively short scanning time, reduced motion artifacts, and inexpensive cost. The current findings have explained the clinical consequences of ischemic injury, brain neurodegeneration, and the onset of clinical symptoms of cognitive impairment followed by brain atrophy. This data provided important clinical context for interpreting changes in brain size is linked with age, trauma and other pathologies related with trauma and resulting in brain atrophy.

CONCLUSION

In conclusion, the current study found that brain atrophy is the loss of connections between neurons. It can be due to old age, trauma, ischemic stroke, multiple sclerosis, post infective and neurodegenerative diseases such as Alzheimer and Parkinson disease. The study also reported the association of brain atrophy with the previous history of diabetes, smoking and alcohol use. The patients had memory problems, poor judgment, loss of language, mood and personality changes and less frequently seizures. The age related brain atrophy is a progressive process that

affects elder people much more than young and CT is useful for nearly all neuro diagnosis including brain atrophy. CT scan is preferred over MRI because of its comparatively shorter scanning time, easy accessibility, reduced motion artifacts and inexpensive cost.

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Original Article

X-ray Radiography of Bone Fractures Associated With Road Traffic Accidents (RTA).

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ABSTRACT

One of the leading causes of bone fractures are Road Traffic Accidents (RTAs), they are perhaps the most prevalent causes of mortality in individuals. **Objective:** To investigate the prevalence and types of bone fractures in patients who have been involved in a road traffic collisions in the city of Gujranwala, Pakistan. **Methods:** It was a cross-sectional analysis at the orthopedic department of the DHQ/Teaching Hospital in Gujranwala, all patients with RTA-related fractures who underwent x-rays were included after written informed consent. The study included a total of 100 patients, all of which had suffered fractures as a result of traffic incidents from January 13th, 2022 to April 13th, 2022, the research was completed in three months. The obtained data were entered and analyzed by utilizing IBM SPSS Statistics 26.0. **Results:** There were 35 females and 65 males in the study, and according to the age distribution, 34% of those aged 26 to 35 years had a higher risk of fracture. Femur 37.7%, tibia 21.3%, fibula 16.4%, radius 2.5%, ankle joint 1.6%, humerus 6.6%, knee joint 2.5%, elbow joint 4.9%, and thumb and spine 0.8% are among the bones that have been fractured. Moreover, no incidents of skull fractures were recorded. **Conclusion:** Bone fractures are much more common in men than in women. In road traffic accidents, the most common bone fracture is the femur, which occurs most frequently in people who ride motorbikes or cycles, whereas, the transverse bone fracture is the most prevalent type of bone fracture.

INTRODUCTION

Fracture is a condition that arises as a consequence of a break, split or crack in the building frame of any osteological component, affecting the skeletal system on regular basis [1]. It might be partial or total, and medically, it is defined as any disruption in a skeletal structure, ranging from total disintegration to small hairline incursion of its structural parts [2, 3]. A broken bone is a partial or full break that impact the integrity of the bone [1, 4]. One of the causes of fracture of the bone is vehicle collisions on the road, which are the major reason for mortality in many human beings [5]. Vehicle crashes on road are the ninth biggest reason for death worldwide, making them a major public health concern [6]. The fact that the bulk of the casualties is young persons, underprivileged, and vulnerable road users is even more disturbing [7]. The

number of annual road traffic deaths has grown to 1.35 million, according to the WHO's Global Status Report on Road Safety 2018, issued in December 2018 [8]. Vehicle/ automobile road collisions are the leading reason of mortality among people aged 5 to 29 years old [9]. Pedestrians, cyclists, and motorcyclists endure a disproportionate amount of the cost, particularly in developing nations [10]. Long bone fractures can happen in several different ways [11], while a transverse fracture is defined by its horizontal nature [12]. Fractures that run parallel to the surface of the bone are known as longitudinal fractures [1]. Another form of fracture that develops when a bone is shattered or breaks apart is a comminuted fracture [1, 13]. Comminuted fractures are referred to as mixed fractures that have both longitudinal and transverse

components [14, 15]. The first kind, known as a Greenstick fracture, occurs when one side of the bone is shattered whereas the other one is twisted [16]. When two bones are fractured in a spiral pattern and are wrenched apart, it is called a spiral fracture [14]. Every day, new and quickly evolving technologies arise in a range of fields, notably in medicine [17]. Certain earlier tactics, on the other hand, are still frequently utilized, effective, and valuable in this respect. X-rays are one of these methods for identifying bone fractures [18]. X-ray is the oldest, quickest, and most extensively used radiographic modality in the world for visualizing the body's interior organs and checking suspicious fractures [19]. It has become a very useful and popular technique for identifying fractures in patients, due to its broad availability in regions where many complex and costly imaging modalities are unavailable [20]. Radiologists or physicians carefully evaluate X-ray images to detect the presence and kind of fractures in numerous bones [21]. Finding the exact site of a fracture in a patient who is in pain or has been injured is difficult and time-consuming. Medical imaging methods are now widely used in both research and diagnosis [22]. The technology of X-ray imaging is used to diagnose and represent anatomical aspects in people, such as bones [23]. X-ray scans are commonly used by doctors and radiologists in hospitals to determine whether or not a fracture has occurred, as well as assessing the particular type of the fracture [24]. Road traffic collisions/accidents (RTAs) claim the lives of a large amount of people every year. Each year a wide array of people pertaining to varying ages are injured due to RTAs. In current study the use of x-rays as a first line of diagnosis in emergency situations of road traffic accidents can be endorsed. The present research will aware and acknowledge the patients to use x-rays as a first diagnosis in immediate conditions, because of its reliability and cost/time effectiveness. Furthermore, it will document the type of injuries in Road Traffic accidents which will draw attention towards road safety measures.

METHODS

All patients with RTA-related fractures who underwent X-rays were included in this cross-sectional analysis at the orthopedic department of the DHQ/Teaching Hospital in Gujranwala. The research was concluded in three months, from January 13th, 2022 to April 13th, 2022. The study included a total of 100 patients, all of these patients had fractures from road vehicle collisions. Patients with fall-related fractures, sports-related fractures, osteoporosis, and patients undergoing bone surgery were all omitted, as were those who refused to take written approval and others who were recalcitrant. A Siemens Ceiling Mount X-Ray machine was utilized to examine the fracture and collect

photos for filming. Whenever applicable, the standard deviation of frequency and percentage were used to express the data. IBM SPSS Statistics 26.0 was used to input the data.

RESULTS

Table 1 illustrates the incidence of fractured bones related with road traffic accidents among people involved; ulna 3 (2.5%), radius 6 (4.9%), femur 46 (37.7%), tibia 26 (21.3%), fibula 20 (16.4%), ankle joint 2 (1.6%), humerus 8 (6.6%), knee joint 3 (2.5%), elbow joint 6 (4.9%), spine 1 (0.8%) and phalanges 1 (0.8%), the femur is the most frequently damaged bone (37.7%), while thumb (0.8%) and spine (0.8%) fractures are the least prevalent

Fractured bones	Frequency	Percent
Ulna	3	2.5
Radius	6	4.9
Femur	46	37.7
Tibia	26	21.3
Fibula	20	16.4
Ankle Joint	2	1.6
Humerus	8	6.6
Knee Joint	3	2.5
Elbow Joint	6	4.9
Spine	1	.8
Thumb	1	.8
Total	122	100.0

Table 1: Total number of fractured bones

Table 2 shows that 41 (33.6%) of patients with RTA-related fractures had to have a transverse fracture, which is the most prevalent type, and 1 (0.8%) had a Garden type IV fracture, which falls in the lowest percentage, least likely to happen.

Fractured bones	Frequency	Percent
Comminuted Fracture	24	19.7
Transverse Fracture	41	33.6
Longitudinal Fracture	6	4.9
Spiral Fracture	25	20.5
Oblique Fracture	17	13.9
Impacted Fracture	8	6.6
Garden Type 4	1	.8
Total	122	100.0

Table 2: Proportion of different kinds of fractures

Table 3 indicates the types of vehicles in RTA that are more to less dangerous and cause accidents, with individuals riding bikes 55 (45.1 %) having the greatest accidents and automobile/car passengers 3 (2.5 %) having the fewest fractures.

Fractured bones	Frequency	Percent
Bike	55	45.1
Cycle	13	10.7

Pedestrian	22	18.0
Car	3	2.5
Auto Rickshaw	19	15.6
Truck/Tractor	10	8.2
Total	122	100.0

Table 3: Different kinds of RTA vehicles

DISCUSSION

Multiple patients with RTA-based fractures who underwent X-rays were considered in this cross-sectional assessment at the orthopedic department. The research was conducted in three months. Total of 100 patients suffering from fractures from road accidents were included. Patients with fall- and sports-related fractures, osteoporosis, and those undergoing bone surgeries were all eliminated, as were those who declined to take written approval and others who were reluctant. A fractured bone is a health ailment in which the connectivity of the bone has been broken or compromised. It's a common bone condition that happens when the bone can't handle external forces such as direct hits, twisting traumas, or falls. Pressure, accident, and osteoporosis are all major causes of bone fracture. In present study, the incidence of fractured bones related with road traffic accidents among people involved; ulna 3 (2.5%), radius 6 (4.9%), femur 46 (37.7%), tibia 26 (21.3%), fibula 20 (16.4%), ankle joint 2 (1.6%), humerus 8 (6.6%), knee joint 3 (2.5%), elbow joint 6 (4.9%), spine 1(0.8%), and phalanges 1(0.8%), whereas, the femur is the most frequently damaged bone (37.7%), while thumb (0.8%) and spine (0.8%) fractures are the least prevalent. Studies by Aloudah et al. 2020, and Anibor, et al. 2021 [5,2], indicated that the femur was the most often shattered bone and the most prone skeletal structure to fracture, followed by the tibia/fibula. This study demonstrated that 41(33.6%) of patients with RTA-related fractures had to have a transverse fracture, which is the most prevalent type, and 1 (0.8%) had a Garden type IV fracture, which has the lowest percentage and is least likely to happen. Based on the current study, the findings of this research were comparable to those of Shahzad et al. 2021, who found that road traffic accidents are the major reason for bone fractures and that transverse bone fractures are the most common type of bone fracture [14]. Current research indicates the types of vehicles in RTA that are more to less dangerous and causes accidents, with individuals riding bikes 55 (45.1 %) having the greatest accidents and automobile/car passengers 3(2.5 %) having the fewest fractures. This study's findings were comparable to those of Omoke & Ekumankama and Shahzad et al., who found that road traffic collisions were the most prevalent cause of fractures [14, 25].

CONCLUSION

The most probable bone fracture in road traffic accidents is the femur, which is more prevalent in people on bikes. The most prevalent kind of fractured bone is a transverse bone fracture.

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Original Article

Ultrasound Diagnosis of Placenta Previa and its Associated Risk Factors with Parity and Previous Cesarean Section

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ABSTRACT

Placenta previa is a pregnancy condition in which the placenta is positioned abnormally either partially or completely covering the cervix. Females with prior cesarean section are at increased risk of developing placenta previa. Objective: To evaluate Placenta Previa and its Associated Risk Factors with Parity and Previous Cesarean Section using ultrasound. Methods: It was a cross-sectional study carried out at the private sector hospital of Gujranwala over 4 months period from December 2021 to March 2022. A total of 42 patients were selected using a convenient sampling approach. Patients identified with placenta previa following ultrasound examination were included after receiving informed consent. The patient's demographic statistics were collected on a specially designed data collecting sheet. The data were analyzed using the SPSS V20.0. Results: The result of this study revealed that women in their 20-30 years are most affected. Most of the women 27(64.3%) with placenta previa present asymptomatic. Risk increases with an increased number of parity and prior cesarean section. Anterior location is the most prevalent location for placenta previa 20(47.6%). Conclusion: The ultrasound is fully capable of detecting placenta previa, its type, and location. There is a direct relationship between previous cesarean section and multiparity with the risk of developing placenta previa.

INTRODUCTION

Placenta previa is a complication of pregnancy in which the cervix is partially or completely covered by the placenta due to its abnormal positioning [1]. The uterus is a muscular pear-shaped organ that houses the developing fetus during pregnancy. The placenta transports trace minerals and oxygen from the mother's bloodstream to the fetus via an umbilical cord. Normally the placenta develops high up in the uterus on the front or back wall of the uterus. In placenta previa, the placenta develops in an incorrect location partially or completely covering the ostium [2]. Placenta previa is a rare obstetric emergency that is associated with an increased frequency of maternal death [3]. It occurs most probably during the second half and third trimesters of pregnancy [4]. Part of the placenta is

made up of maternal tissue, while the other half is made up of embryonic tissue [5]. placenta previa is a severe pregnancy issue that is the major reason for postpartum hemorrhage, which often endangered the lives of pregnant women [6]. After a single Cesarean delivery, the chance of placenta previa increases, and the prevalence rises even more as the number of Cesarean deliveries increases [7,8]. A previous C-section delivery doubles the likelihood of placenta previa in subsequent pregnancies, and those females are especially vulnerable to placenta accrete [9]. In the early detection of placenta accreta, ultrasound is extremely sensitive and specific [10]. High gravidity, high parity, and previous cesarean procedures all raise the incidence of placenta previa [11]. Placenta previa,

especially in women who have had a previous uterine scar, is a substantial risk factor for postpartum hemorrhage [12]. Pregnant women with placenta previa are more likely to experience placental inadequacies [13]. Placenta previa is linked to maternal and fetal complications, such as placental adhesion, antepartum hemorrhage, postpartum hemorrhage, malpresentation, and intrauterine growth restriction (IUGR), thrombophlebitis, preterm labor, and septicemia [14,15]. One fifth of all cases of antepartum hemorrhage are caused by placenta previa [16]. The leading causes for the establishment of placenta previa include the record of placenta previa, prior cesarean birth, numerous gestations, usage of ovulation pills, and rising maternal age [17]. Surgery of the uterus, usage of cigarettes, and drugs are other factors that contribute to the development of placenta previa [18]. Safe vaginal delivery is not possible due to placenta previa so the newborn must be delivered through cesarean section. Using ultrasound many instances can be detected in the early stages of gestation but others may report to the emergency department with pain-free vaginal discharge [19]. Due to 'placental migration,' the chances of placenta previa decrease with rising stages of pregnancy. This is because the uterine wall without the placenta grows quicker than the uterine wall with the placenta. Although the placenta does not travel itself, the parenchyma in which it is implanted swells, causing the placenta to appear to progress up and back from the cervix [20]. Because the significant antepartum and intrapartum hemorrhage associated with placenta previa it is one of the primary reasons for the mother's death. Furthermore, placenta previa is linked to preterm delivery, with prematurity raising neonatal mortality threefold [21]. Ultrasonography can be used to detect placenta previa before delivery [22]. Ultrasonography is the most accurate procedure for diagnosing placenta previa, with a 96 percent accuracy rate. Despite the use of ultrasonography with high resolution, morbidity and death have not decreased [23]. In placenta previa anterior placentation is reported to induce more severe hemorrhage during cesarean section in comparison to the posterior position [24]. The incidence of Previa placenta is increasing worldwide from 0.28-to 1.5 percent according to numerous articles due to rising rates of pregnancy in women of older ages, reproductive therapies, and previous cesarean births [25]. The purpose of this study was intended to illustrate the location of placenta previa in pregnant women and make them aware of the fact of developing placenta previa due to the rising percentage of previous cesarean sections and percentage of parity. The location and degree of placenta previa can be best determined using ultrasound.

METHODS

It was a cross-sectional method of a study conducted in the department of radiology of private sectors hospital in Gujranwala, Pakistan. Subjects for this study were only females from 20 to 40 years who have undergone ultrasound. This study was conducted over 4 months from December 2021 to March 2022. A total of 42 patients were selected using a convenient method of sampling [2]. An informed written consent form was also signed by patients. The study was simultaneously conducted in the Department of Diagnostic Radiology in the Ultrasound department. The ultrasound was done using a 3.5 MHZ probe.

RESULTS

The current study was conducted among 42 females for the study of placenta previa on ultrasound. The current study was conducted among patients with different age groups ranging from 20 to 40 years. With the highest frequency at 19(45.2%) at 26-30 years and the lowest at 3(7.1%) at 36-40 years as shown in Table 1.

Age of patient	Frequency	Percent
20-25 years	6	14.3
26-30 years	19	45.2
31-35 years	14	33.3
36-40 years	3	7.1
Total	42	100.0

Table 1: Age of patients

Most patients were asymptomatic with a frequency of 27(63.4%) and patients with a frequency of 15(35.7%) presented with painless vaginal bleeding, as shown in Table 2.

Sign and symptoms	Frequency	Percent
None	38	41.8
Painless vaginal bleeding	53	58.2
Total	91	100.0

Table 2: Signs and symptoms of placenta previa

Table 3 Show the number of parity with highest frequency 12(28.6%) and lowest frequency of 3(7.1%).

Parity	Frequency	Percent
0	7	16.7
1	6	14.3
2	7	16.7
3	7	16.7
4	12	28.6
5	3	7.1
Total	42	100.0

Table 3: Number of parity

Patients diagnosed with minor degree placenta previa observed the highest frequency of 29(69%) and the major degree of placenta previa observed was 13(31%) as shown in Table 4.

Type of placenta previa	Frequency	Percent
Minor	29	69.0
Major	13	31.0
Total	42	100.0

Table 4: Type of placenta previa

Most of the patients were found with the highest anterior placental location 20(47.6%) posterior placental location 13(31%) and lateral placental position with the lowest frequency of 9(21.4%) as shown in Table 5.

Placenta previa location	Frequency	Percent
Anterior	20	47.6
Posterior	13	31.0
Lateral	9	21.4
Total	42	100.0

Table 5: Location of placenta previa

The risk of placenta previa was found to be increased in patients with a previous number of cesarean sections. The current study found the highest frequency of 9(21.4%) and the lowest frequency of 2(4.8%) as shown in table 6

Previous cesarean section	Frequency	Percent
0	17	40.5
1	2	4.8
2	3	7.1
3	4	9.5
4	7	16.7
5	9	21.4
Total	42	100.0

Table 6: Previous cesarean section

DISCUSSION

Placenta previa is an abnormal positioning of the placenta covering the os either partially or completely. The risk of placenta previa increases in females with a history of prior cesarean section. It endangers the lives of both mother and fetus. A total of 42 patients were selected using a convenient sampling approach. The current study included females from 20-40 years to evaluate placenta previa using ultrasound. Patients in the age group 26- 30 years 19(45.2%) were more prevalent to have placenta previa whereas the previous study published in 2017 by Elhaj also found similar results having more chance of placenta previa at around 30 years [2]. Another study by Frah published in 2016 also supported the result by having 50(33.5%) patients between the age group 23-45 years of placenta previa [11]. Both previous studies have similar findings to the current study. Moreover, the current study found that 27(64.3%) asymptomatic patients and 15(35.7%) with complain of painless vaginal bleeding. This point resembled the previous study by Elhaj published in 2017 which also found that 26(61.9%) presented with no complaints and 16(38.1%) were with painless vaginal bleeding [2]. The current study concluded that multiparous patients were at high risk of placenta previa 12(28.6%), a study by Elhaj published in 2017 shows that multiparous women were more prone to develop placenta previa

(85.8%) [2]. Both studies had similar findings relative to parity. The current study shows that the frequency distribution of placenta previa with the highest frequency of minor placenta previa 29(69%) and lowest frequency of major placenta previa 13(31%), similar results are also concluded by Elhaj with the highest frequency of minor placenta previa 22(52.4%) and lowest frequency 20(47.6%) [2]. The current study shows that the placenta previa occurs more commonly in the anterior location 20(47.6%) and less frequently in the lateral location 9(21.4%). The same results are concluded by Elhaj shows that the anterior location is the most commonly affected side 19(45.2%) and the least affected on the lateral side 10 times (23.8%) [2]. The current study shows that the risk of developing placenta increases with prior cesarean section 9(21.4%). The study by Frah also concluded that a previous cesarean section increases the prevalence of placenta previa 26(52.0%) [11].

CONCLUSION

The study concluded that the frequency of asymptomatic women was more in females presenting with pain-free vaginal bleeding. A large number of females with placenta previa were multiparous. The incidence rises with the frequency of prior cesarean deliveries and the mother's age. Placenta previa develops more commonly at the anterior site as compared to the posterior location.

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Original Article

Sonographic Evaluation of Urinary Bladder Wall Thickness in Healthy Adults

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ABSTRACT

The urinary bladder is distensible empty viscous with thick muscular walls organ in the pelvis. For normal urination the wall thickness of the bladder should be normal in the range. Objective: To determine urinary bladder wall thickness using ultrasound in normal adults. Methods: It was a cross-sectional study conducted over 4 months from December 2021 to March 2022 in the private sector hospital in Gujranwala, Pakistan. A sample size of 60 was collected using the convenient sampling approach from taking mean of sample sizes of previous related study. Participants with no disease were included after informed consent. Data were analyzed and entered using SPSS version 20.0. Results: The mean age of participants was 33.41 ± 11.9 , the mean weight was 75.51 ± 13.9 and height was 171.08 ± 12.5 . The mean body mass index was 25.00 ± 3.9 . The mean of anterior wall thickness was 2.85 ± 0.405 and posterior wall thickness was 2.86 ± 0.430 . Regarding lateral wall thickness, mean right lateral was 2.78 ± 0.464 and left lateral was 2.80 ± 0.430 . The participants categorized into normal, overweight and obese showed very slight differences in the mean values of anterior, posterior and lateral wall thickness of bladder. Conclusion: In conclusion, ultrasound is the best modality for measuring the wall thickness of the urinary bladder in both males and females. The age and gender do not affect BWT. A small change is noted in thickness of anterior, posterior and lateral walls of urinary bladder.

INTRODUCTION

The urinary bladder is a strong and distensible empty viscous with thick muscular walls organ in the pelvis. It lies slightly above and behind the pubic bones [1,2]. The rectum and seminal vesicle are posteriorly adjoined by the bladder, the prostate is inferiorly adjoined by the bladder and the pubis and peritoneum are anteriorly adjoined by the bladder in males. The vagina is positioned posteriorly while the uterus is situated superiorly in females [3]. A pair of kidneys, ureters, urinary bladder and urethra form the urinary system [4]. When the bladder became full with urine it becomes oval shaped organ [5]. A normal bladder can hold a maximum of 2 cups of urine for about 2 to 5 hours in a healthy adult [6]. Its shape varies among different individuals [7]. The urinary bladder has the diameter of a

pear when it is in an empty state [8]. It is a temporary place for urine storage [9]. In Bladder's inner surface, the rugae line has numerous folds. when urine fills in the bladder its inner surface extends [10]. The normal capacity of an adult's bladder for holding urine lies typically between 300-600ml [11]. In the course of excretion, the muscles of the bladder normally squash and after that all urine transit from the body through the urethra. The urethra in appearance is a tube [12]. Urethra carries urine after the filtration by the pair of kidneys through the urinary bladder to compare the outside of the body [13]. Normal urethras of men measure 8 inches as compared to women the length of urethras is 1.5 inches [14]. Urinary bladder wall is composed of these various layers, a transitional epithelium cells layer that

surrounds the interior of the kidneys, ureters, urinary bladder and urethra. The layers of cells in this area are urothelial or transitional cells. Lamina propria usually follows urothelium a kind of connective tissue. Muscularis propria is the most obvious layer of the bladder wall. The outer surface of the urinary bladder is covered by loose connective tissue by retaining distance from the various organs [15]. The bladder wall thickness in normal adult women is 3.0 mm, whereas normal adult men have a thickness of 3.3 $\pm$ 1.1 mm [16]. For normal urination the wall thickness of the bladder should be normal in the range. Various factors can alter the bladder wall thickness such as infection and obstruction of U.B, radiotherapy or urinary calculi etc. [17]. Its thickness increases with age in both genders, while women have lower bladder wall thickness than men [16]. The risk of increase in thickness is most commonly seen in old-age men. For the evaluation of these diseases or any kind of pathology in the urinary bladder or the bladder wall or its neighboring organs in the pelvic area, Pelvic ultrasound is performed which is minimally invasive, cheap and easily available [18,19]. Variables that affects the bladder wall thickness are gender, age difference, height and weight of individuals [20]. Ultrasound is done to evaluate normal and abnormal findings. It is considered as one of the safest and preferable modalities worldwide [21]. It provides benefits of direct patient contact over the cross-sectional imaging technologies. It is cheap as compared to CT and MRI [22]. It can be used by people of any age [23]. study investigated the normal measurements of urinary bladder wall thickness in different age groups of individuals using pelvic ultrasound. This study revolves around the normal wall thickness of the urinary bladder in healthy adults. Normal evaluation can provide a great range of benefits for the future spread of the diseases. Moreover, it can help to keep the individuals aware of their internal functioning of organs.

METHODS

It was a cross-sectional study conducted for 4 months from December 2021 to March 2022 in the private hospital of Gujranwala. A sample size of 60 was collected using convenient sampling approach from the previous related published study [2]. All the participants with normal bladder wall thickness were included after informed consent in this study. Participants with UTI, Kidney diseases, prostate-related abnormalities and lower urinary tract disorders were excluded. A high frequency curvilinear probe was used with ultrasound machine Toshiba with patients in supine, for evaluation of urinary bladder. All the patients were instructed to drink a maximum amount of water and avoid micturition before the scan. Data were analyzed and entered using SPSS version 20.0.

RESULTS

The current study included 60 patients to evaluate the normal thickness of the urinary bladder wall. Table 1 shows that males 33(55%) are more prior to have a difference in bladder wall thickness than females 27(45%). More commonly adults have a difference of 35(58%) and in older people is 10(16.7%) in bladder wall thickness.

Gender	Frequency	Percent
Male	33	55.0
Female	27	45.0
Total	60	100.0

Table 1: The frequency distribution of gender

Table 2 shows age groups of participants age groups are 20-30years having frequency 35(58.3%), 31-40years as 10(16.7%), 41-50years as 6(10.0%), 51-60years as 9(15.0%).

Age group	Frequency	Percent
20-30	35	58.3
31-40	10	16.7
41-50	6	10.0
51-60	9	15.0
Total	60	100.0

Table 2: Age group of Participants

Table 3 shows that the mean age of participants was 33.41 $\pm$ 11.9. The mean weight was 75.51 $\pm$ 13.9. The mean height was 171.08 $\pm$ 12.5. The mean body mass index was 25.00 $\pm$ 3.9. The mean anterior wall thickness was 2.85 $\pm$ 0.405. The mean posterior wall thickness was 2.86 $\pm$ 0.430. The mean right lateral wall thickness was 2.78 $\pm$ 0.464. The mean left lateral wall thickness was 2.80 $\pm$ 0.430.

Descriptive Statistics	N	Lowest	Highest	Mean $\pm$ SD
Age of Participants	60	20.00	60.00	33.42 $\pm$ 11.9
Weight in Kg	60	52.00	105.00	75.52 $\pm$ 13.9
Height in cm	60	149.35	201.17	171.08 $\pm$ 12.6
Body Mass Index	60	17.90	36.30	25.01 $\pm$ 3.9
Anterior wall thickness	60	2.00	3.40	2.858 $\pm$ 0.41
Posterior wall thickness	60	2.00	3.50	2.86 $\pm$ 0.43
Right lateral wall thickness	60	2.00	3.50	2.78 $\pm$ 0.46
Left lateral wall thickness	60	2.00	3.40	2.81 $\pm$ 0.43

Table 3: Descriptive statistics, BMI, bladder wall, Weight, and Height

Table 4 shows that mean of normal anterior wall thickness was 2.8923 $\pm$ 0.40686, the mean of normal posterior wall thickness was 2.9000 $\pm$ 0.42332, the mean of normal right lateral wall thickness was 2.9231 $\pm$ 0.43571 and the mean of normal left lateral wall thickness was 2.8692 $\pm$ 0.41930. The mean of overweight anterior wall thickness was 2.8393 $\pm$ 0.41127, the mean of overweight posterior wall thickness was 2.8571 $\pm$ 0.41135, the mean of overweight right lateral wall thickness was 2.6750 $\pm$ 0.48582, and the mean of overweight left lateral wall thickness was 2.7643 $\pm$ 0.45478. The mean of obese anterior wall thickness was 2.8000 $\pm$ 0.42895, the mean of obese posterior wall thickness was 2.7000 $\pm$ 0.58310, the mean of obese right lateral wall thickness was 2.6667 $\pm$ 0.37238 and the mean of obese left

lateral wall thickness was 2.7333 ± 0.39833 .

BMI		Thickness of Anterior wall	Thickness of Posterior wall	Thickness of Rt. Lateral wall	Thickness of Lt. Lateral wall
Normal	Mean $\pm$ SD	2.89 $\pm$ 0.41	2.91 $\pm$ 0.42	2.92 $\pm$ 0.43	2.86 $\pm$ 0.42
	N	26	26	26	26
Overweight	Mean	2.84 $\pm$ 0.41	2.8571 $\pm$ 0.41	2.6750 $\pm$ 0.48	2.7643 $\pm$ 0.45
	N	28	28	28	28
Obese	Mean	2.8000 $\pm$ 0.43	2.7000 $\pm$ 0.58	2.6667 $\pm$ 0.38	2.7333 $\pm$ 0.39
	N	6	6	6	6
Total	Mean	2.8583 $\pm$ 0.41	2.8600 $\pm$ 0.43	2.7817 $\pm$ 0.46	2.8067 $\pm$ 0.43
	N	60	60	60	60

Table 4: Urinary bladder wall measurements in different BMI

DISCUSSION

In the current study total number of patients 60 was enrolled to evaluate urinary bladder wall thickness using ultrasonography. The age of patients ranged from 20 to 60 years. In patients with bladder outlet blockage and other voiding disorders, ultrasound assessment of bladder wall thickness has been considered a valuable diagnostic tool. The current study investigated the normal measurements of urinary bladder wall thickness in different age groups of individuals using pelvic ultrasound. Normal evaluation provides a great range of benefits for the future spread of the diseases. It helps to keep the individuals aware of their internal functioning of organs. A similar study was conducted by Elmardi 2020 [2]. He concluded that the anterior, posterior, and lateral wall thickness of the urinary bladder is around 2 to 4 mm similar to my study in which the thickness of the wall is between 2 to 3mm. His study also concluded that BMI affects urinary bladder wall thickness significantly. In current study, the mean weight was 75.51 ± 13.9 . The mean height was 171.08 ± 12.5 . The mean body mass index was 25.00 ± 3.9 . A study was also done by Ugwu et al in 2018 in which he considered 384 participants showed similar results. The mean of their weight, height, and BMI were 76.0 ± 1.0 , 170 ± 1.1 and 27.0 ± 8.0 , respectively. They concluded that there are no significant differences in wall thicknesses of the urinary bladder as concluded by my study. In current study, males 33(55%) are more prior to have a difference in bladder wall thickness than females 27(45%)[7]. A study was done by Sidi et al, on 10 august 2021 that aim at evaluating the bladder wall thickness among apparently healthy adults in Kano metropolis, Nigeria using ultrasound. They concluded in his study that the urinary bladder wall thickness can be different at a mild level between males and females[23].

CONCLUSION

The current study concluded that, ultrasound is the best imaging modality for measuring the wall thickness of the urinary bladder. It is a safe, non-invasive, and easily available tool. Age has no significant effect on BWT while gender affects BWT to some extent. A small change was noted in A.W.T, P.W.T., and L.W.T. in all participants

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Original Article

Evaluation of Pulmonary Tuberculosis Using High Resolution Computed Tomography (HRCT): A Cross Sectional Study

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ABSTRACT

Mycobacterium is an airborne organism that spreads from person to person. Tuberculosis can affect any area of the body, although the lungs are the most commonly affected known as pulmonary tuberculosis. **Objective:** To evaluate pulmonary tuberculosis using High Resolution Computed Tomography. **Methods:** It was a cross-sectional study conducted at the private sector hospital Gujrat, Pakistan. This study was conducted over 4 months from December 2021 to March 2022. The sample size of 91 patients was calculated via a convenient sampling approach from previously published articles. Patients who were diagnosed with TB during CT scan investigation presented at the study area were included after informed consent. A specially crafted data collection sheet was developed to contain the patient demographic statics. **Results:** The upper age limit occurrence of 36(39.6%) was observed in people aged 21 to 30 years, and the lowest occurrence of 7(7.7%) was observed in those aged under 21 years. Males composed 53% of the population, while females constituted 38%. (41.8 percent). The highest proportion of cough was 43(47.3 percent), and the lowest frequency of weight loss was 14 (15.4 percent). The nodule incidence is 30(33%) and the LAP incidence is 6(6.6 percent). **Conclusion:** Pulmonary tuberculosis was more prevalent among younger male individuals. The primary characterization among pulmonary tuberculosis patients was nodules, cavity, consolidation, and tree in bud shown on HRCT.

INTRODUCTION

Tuberculosis remains a major cause of death in less developed countries where populations are dense and sanitation standards are inadequate [1,2]. During 2011, 8.7 million of people infected tuberculosis (TB), with 1.4 million of them died as a direct result [3]. T.B in low- and bottom third countries, mortality accounts for over 95% of T.B deaths. According to WHO, it is now one among the top three leading causes of death among women aged 15 to 45. Tuberculosis is caused by bacteria which including *M.tuberculosis*, *M.bovis*, *M.microti*, *M.africanum*, and *M.canettii* [4,5]. Mycobacterium is an airborne organism that spreads from person to person. Tuberculosis can be treated and avoided [6]. Tuberculosis can affect any area of the body, although the lungs are the most commonly affected and creating a type of tuberculosis known as

pulmonary tuberculosis [7]. Post-primary TB, also known as reinfection tuberculosis, is the most frequent form of active infectious diseases in adults [8]. Extra pulmonary TB occurs when tuberculosis develops outside of the lungs. In up to 33% of instances, other organs (liver, kidney, pancreas, brain or lymph nodes, spleen) are impacted [9]. Tuberculosis is defined as either latent or active. In Latent tuberculosis, you have a tuberculosis infection, but the bacteria remain dormant in your body and create no symptoms [10]. An educated guess One-third of the worldwide people has TB Disease [11]. Inactive tuberculosis you will become ill as a result of this illness, which can also spread to others [12]. It's possible It could happen within the first several weeks after contracting the tuberculosis germs, or it could happen later years down the



road [13]. The majority of infections are asymptomatic and latent, but around one-third of them are not [14]. A tiny fraction of latently infected people (5 to 10%) reactivate their infection during the course of their lives, resulting in active illness (reactivation). A persistent cough either with hematuria, body weight, chills with difficulties sleeping, and widespread malaise are the most obvious signs of active pulmonary TB [16]. Delays in diagnosing active cases of pulmonary tuberculosis add to the disease's burden, and these delays can be caused by a variety of factors [17]. TB can mimic many other diseases clinically and radiologically, such as pneumonia, cancer, and interstitial lung disorders; nevertheless, the yield of sputum smears is still low, and the findings take a few days to arrive [18]. Although new radiological cultures take roughly two weeks to generate new knowledge and are not accessible in every facility [19]. Culture for mycobacterium TB, which is the gold standard in diagnosing TB, takes up to 6 weeks for sure results [20]. As a result of the challenges in diagnosis, the patient's isolation is delayed; increasing the chance of transmission of infection and the severity of the illness worsening. A lung imaging is required for the first examination of PTB. Regression, enlarged lymphocytes, pulmonary edema, and extra - pulmonary nodules on imaging are all symptoms of primary TB. Apical consolidation, nodules, and cavitation are hallmarks of post-primary TB [22]. HRCT is a useful adjunct to chest X-rays in tuberculosis diagnosis, and it is more effective than chest radiographs in identifying and defining moderate histologic disease or mediastinal lymphadenitis [23]. Although sputum culture for acid-fast bacilli is the "standard method" for pulmonary TB diagnosis, computed tomography's greater sensitivity may allow early detection in tuberculosis patients with normal or equivocal radiographic abnormalities [24]. This study's goal was to show that HRCT is more accurate than a chest x-ray at detecting small granulomatous lesions and minor or concealed parenchymal illness, and measuring disease activity in patients with pulmonary tuberculosis. This study validates the clinicians about accuracy of HRCT for effective evaluation of pulmonary tuberculosis.

METHODS

It was a cross-sectional study conducted at the private sector hospital Gujrat, Pakistan. This study was conducted for 4 months from December 2021 to March 2022. The sample size of 91 patients was calculated via a convenient sampling approach from previously published articles [25-27]. Patients who were diagnosed with TB during CT scan investigation were included after informed consent. A specially crafted data collection sheet was developed to contain the patient demographic statics. The patients' demographic statistics were collected on a specially

designed data collecting sheet. SPSS version 20.0 was used for data entry and analysis.

RESULTS

Table 1 shows that upper age limit occurrence of 36(39.6%) was observed in people aged 21 to 30 years, and the lowest occurrence of 7(7.7%) was observed in those aged under 21 years.

Age of patient	Frequency	Percent
<21	7	7.7
21-30	36	39.6
31-40	22	24.2
41-50	26	28.6
Total	91	100.0

Table 1: Frequency distribution of patient age

Table 2 shows that males made up 53 percent of the population, while females made up 38 percent (41.8 percent).

Gender	Frequency	Percent
Female	38	41.8
Male	53	58.2
Total	91	100.0

Table 2: Frequency distribution of patient gender

Table 3 shows the highest proportion of cough was 43 (47.3 percent), and the lowest frequency of weight loss was 14 (15.4 percent).

Presenting complain	Frequency	Percent
Cough	43	47.3
Fever	19	20.9
chest pain	15	16.5
weight loss	14	15.4
Total	91	100.0

Table 3: Frequency distribution of presenting complain

Table 4 shows HRCT finding that the nodule incidence is 30(33%) and the LAP incidence is 6(6.6 percent).

HRCT Findings	Frequency	Percent
Nodules	30	33.0
Cavity	21	23.1
Consolidation	19	20.9
tree-in-bud	15	16.5
LAP	6	6.6
Total	91	100.0

Table 4: Frequency distribution of HRCT findings

DISCUSSION

Mycobacterium (TB) is a viral infectious agent in the tuberculosis complex. Bacteria such as M. TB, M. Bovis, M. Microti, M. Africanum, and M. Canettii cause tuberculosis. A descriptive inter research was carried out in the private sector hospital Gujrat. Patients who were diagnosed with tuberculosis after a Tomography investigation and appeared at the research site during the course of the study were included. In the current study, the age is distributed in four groups, a maximum age frequency of 36(39.6%) is seen in 21-30 years and a minimum frequency

of 7(7.7%) is seen in less than 21 years. Patients above the age of 65 are at a higher risk of contracting tuberculosis, according to a prior cross-sectional study published in 2020 by Rasheed et al. and a prospective observational study published in 2017 by Raj et al, [27, 28]. In the present study the frequency of male is 53(58.2%) and frequency of female is 38(41.8%). Males have a high chance to be affected by tuberculosis as declared by an observational study by Raj et al, in 2017 and Rasheed et.al study which is published in 2020 conducted at a large tertiary care teaching hospital [28]. The current study shows a maximum frequency of cough 43(47.3%) and a minimum frequency of weight loss. Another previously published paper by Rasheed et.al in 2020 has similar results which show that TB patients are commonly affected by cough [27]. In the current study 4 maximum frequency of nodule 30(33%) and a minimum frequency of LAP 6(6.6%). Similar results were shown by Raj et.al in 2017, concluded that nodule 63(63%) was the most common feature in HRCT findings [28]. Another previous cross-sectional study by Ahmed et.al which is published in 2019 also concluded that there were nodules in 17(34%) patients, cavity in 13(26%) patients, consolidation in 10 (20%) patients, Tree Bud in 7 (14%) patients, and lymphadenitis in 3(6%)[23].

CONCLUSION

According to the findings of this study, pulmonary tuberculosis was more prevalent among younger male individuals. Nodules, cavity, accumulation, and Tree in Bud were the most common pulmonary TB symptoms. HRCT can discriminate between active from inactive disease with greater sensitivity and whenever tuberculosis is suspected clinically, HRCT is advised for diagnosis confirmation and activity determination.

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Original Article

Grading Of Renal Parenchymal Disease Using Gray Scale Ultrasound

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ABSTRACT

The shape of the normal adult kidney is like a bean, retroperitoneally present between twelve thoracic and third lumbar vertebra. Ultrasound can identify increased cortical echogenicity and reduced cortical parenchymal thickness, as well as reduced renal size in CKD. **Objective:** To diagnose renal parenchymal disease and its grading using gray scale sonography. **Methods:** It was cross-sectional research undertaken at Tertiary Hospital in Lahore, Pakistan radiology department. This research took place over five months, from January 2022 to May 2022. A convenient sampling approach using previously published articles was used to obtain a sample size of 78 patients. After informed consent, patients who were assessed for renal ultrasonography at the study region, during the study period, were included. Data was entered and analyzed on SPSS version 22.0. **Results:** The mean age was 46.47 ± 12.0 . The frequency for males was 47(60.3%), and for females was 31(39.7%). Blood urea (mg/dl) had a mean value of 92.16 ± 46.88 , and Serum creatinine (mg/dl) in male patients had a mean value of 6.86 ± 6.18 while in female patients had 5.50 ± 5.36 . The blood urea nitrogen of patients had a mean value of 50.16 ± 33.70 and a glomerular filtration rate with a mean value of 81.34 ± 23.12 . The frequencies of sonographic grading of renal cortical echogenicity show patients of Grade 1 had 32(41.0%), Grade 2 28(35.9%), Grade 3 12(15.4%), and Grade 4 6(7.7%). **Conclusion:** Renal parenchymal disease is the most prevalent disease in elder males. Grade 1 of renal parenchymal disease is most common in patients, followed by Grade 2, Grade 3, and Grade 4.

INTRODUCTION

The kidneys are intricate organs that contribute significantly to normal physiological functions [1]. The urinary system is comprised of paired kidneys, paired ureters, urinary bladder, and urethra. The shape of the normal adult kidney is like a bean and sits retroperitoneally present between the twelve thoracic and third lumbar vertebra [2]. The renal medulla and renal cortex are the functioning portions of the kidneys. The kidney has several functional units in each lobe. The typical lobe is made up of a calyx, a medulla, a cortex, and blood vessels [3]. Kidney disease is a broad phrase that encompasses a wide range of diseases that disrupt the anatomy and physiology of the kidneys [4]. Acute refers to a time of three months or less, whereas chronic refers to a term of more than three months [5]. A variety of illnesses have detrimental effects on renal parenchyma and can lead to kidney failure [6]. It is

considered to have higher echogenicity when the liver or spleen is less echogenic than the right or left kidney respectively [7]. Chronic kidney disease (CKD) has a detrimental effect on long-term health outcomes because it increases the risk of cardiovascular disease and accelerates the onset of renal failure [8]. Patients with kidney illness frequently experience cognitive impairment. The level of serum creatinine is a well-established indication of renal parenchymal disease severity [9,10]. Ultrasonography is a low-cost, non-invasive examination technique that provides enough anatomical information to diagnose kidney abnormalities without patient exposure to radiations, and it has so effectively supplanted traditional radiography in the United States and internationally [11]. These details help determine the severity of renal parenchymal damage, its reversibility, and whether or not a

renal biopsy is necessary. Cortical echogenicity is used to grade kidney disease, with Grade 1 indicating mild disease, Grade 2 indicating moderate disease, Grade 3 indicating severe disease, and Grade 4 indicating end-stage renal disease [12]. Grade 0: renal parenchyma is less echogenic than the liver [13]. Grade 1: renal parenchyma has the same echogenicity as the liver. Grade 2: renal parenchyma has echogenicity more than that of the liver [10]. Grade 3: renal parenchyma has echogenicity more than that of the liver, and poor corticomedullary distinction [13,14]. Grade 4: renal parenchyma has echogenicity more than that of the liver, and corticomedullary distinction is lost [15]. To evaluate regardless of whether the renal disease is worsening or is normal, serial sonographic tests are conducted. USG can identify increased cortical echogenicity and reduced cortical parenchymal thickness, as well as reduced renal size [16]. Early detection can aid in the adoption of early treatment [17]. Sonographic measurements such as length of kidney, corticomedullary distinction, and echogenicity of renal cortex do not allow for differentiating various types of renal health illnesses in individuals with renal parenchymal disease [18,19]. Increased cortical echogenicity, on the other hand, is a non-specific sign of renal parenchymal illness. Sonographic parameters for assessing renal parenchymal disease include the size of the kidney, contour, corticomedullary distinctions, thickness of the cortex, and prominence of the medullary pyramids [20,21]. In a healthy kidney, the renal cortex generates lower-intensity back-scattered echoes than that of the liver, spleen, or renal sinus. In contrast, the renal medulla is somewhat hypoechoic [22]. Renal length and parenchymal thickness diminish as CKD progresses, whereas parenchymal echogenicity rises [23]. Permanent damage is indicated by a renal length of less than 10cm and increased echogenicity [24]. Diabetes and hypertension are two of the most prominent chronic non-communicable diseases, both of which are common triggers for end-stage renal failure [25,26]. Ultrasound is the initial imaging modality utilized to explore the kidneys, it is critical in the diagnosis of renal illness. The radiologist will be able to understand the clear criteria and detrimental findings that are symptomatic of pathology, allowing them to recognize it early and design a treatment strategy to avoid complications.

METHODS

It was cross-sectional research undertaken at Tertiary Hospital in Lahore, Pakistan radiology department. This research took place over five months, from January 2022 to May 2022. A convenient sampling strategy using previously published articles was used to obtain a sample size of 78 patients [6,10,19,21,27]. After informed consent,

patients who were assessed for renal ultrasonography, increased Urea, Serum creatinine, Blood urea Nitrogen, and Glomerular Filtration Rate at the study region during the study period were included. Known subjects with a history of acute kidney injury, kidney transplant patients, and obstructive uropathy were excluded. The patient demographic data was collected on a specially designed data collection sheet. Data were entered and analyzed on SPSS version 22.0.

RESULTS

The mean age was 46.47 ± 12.03 , with a minimum age of 28.00 and a maximum age of 83.00. Gender distribution shows the frequency of males 47(60.3%), and females 31(39.7%). According to signs and symptoms of patients with renal parenchymal disease shows that 32(9.2%) patients came with nausea, 16(4.6%) patients came with vomiting, 21(6.0%) patients came with the loss of appetite, 61(17.5%) patients came with fatigue and weakness, 21(6.0%) patients came with sleep problems, 45(12.9%) patients came with urinating more or less, 57(16.3%) patients came with muscle cramps, some of them like 19(5.4%) came with shortness of breath, 32(9.2%) came with dry itchy skin, 39(11.2%) patients came with swelling of feet and ankles and 6(1.7%) patients came with others, Table 1.

Signs and Symptoms of patients	Frequency	Percent
Nausea	32	9.2
Vomiting	16	4.6
Loss of appetite	21	6.0
Fatigue and weakness	61	17.5
Sleep problems	21	6.0
Urinating more or less	45	12.9
Muscle cramps	57	16.3
Shortness of breath	19	5.4
Dry itchy skin	32	9.2
Swelling of feet and ankles	39	11.2
Others	63	1.7
Total	49	100.0

Table 1: Classification of a subject according to signs and symptoms

Classification by clinical etiology of the renal parenchymal disease shows that 34(43.6%) patients came with diabetes mellitus, 21(26.9%) patients came with hypertension, 17(21.8%) came with diabetes and hypertension combined and 6(7.7%) patients came with unknown etiology, Table 2.

Clinical history of patients	Frequency	Percent
Diabetes Mellitus	34	43.6
Hypertension	21	26.9
Diabetes and hypertension	17	21.8
Unknown etiology	6	7.7
Total	78	100.0

Table 2: Classification by clinical etiology

Table 3 demonstrates the descriptive statistics of Blood urea (mg/dl) with the least value of 41.00, a higher value of 239.00, and a mean value of 92.17 ± 46.9 . Serum creatinine in male patients (mg/dl) was with the least value of 1.40, a higher value of 18.90, and a mean value of 6.87 ± 6.2 . Serum creatinine in female patients (mg/dl) was with the least value of 1.40, a higher value of 17.40, and a mean value of 5.50 ± 5.4 . Blood urea nitrogen of patients was with the least value of 26.00, a higher value of 248.00, and a mean value of 50.17 ± 33.7 . Glomerular filtration rate was with minimum value 35.00, maximum value 220.00, and mean value 81.34 ± 23.12 .

Descriptive Statistics	N	Minimum	Maximum	Mean+SD
Blood urea of patients (mg/dl)	78	41.00	239.00	92.17 ± 46.9
Serum creatinine of male patients (mg/dl)	47	1.40	18.90	6.87 ± 6.2
Serum creatinine of female patients (mg/dl)	31	1.40	17.40	5.50 ± 5.4
BUN (Blood Urea Nitrogen)	78	26.00	248.00	50.17 ± 33.7
GFR (Glomerular Filtration Rate)	78	35.00	220.00	81.35 ± 23.1

Table 3: Descriptive statistics of Blood chemistry

Table 4 demonstrates the frequencies of sonographic grading of renal cortical echogenicity with Grade 1 had 32(41.0%), Grade 2 28(35.9%), Grade 3 12(15.4%), and Grade 4 6(7.7%).

Sonographic grading of renal cortical echogenicity	Frequency	Percent
Grade 1	32	41.0
Grade 2	28	35.9
Grade 3	12	15.4
Grade 4	6	7.7
Total	78	100.0

Table 4: Sonographic grading of renal cortical echogenicity

DISCUSSION

In the present study, out of 78 patients, the minimum age was 28.00 years, the maximum age was 83.00 years, and the mean age was 46.47 ± 12.03 as mentioned by the study by Raju et al, with a mean age of 49.27 ± 10.09 [21]. Another previously published study by Singh et al, also shows the mean age of 54.32 ± 12.25 . All of the above-mentioned previously published studies and the present study concluded that renal parenchymal disease is most prevalent in the elder age. In this study, the renal parenchymal disease is observed to be more common in males 47(60.3%), and less in females 31(39.7%) as stated by the study by Raju et al, that renal parenchymal disease is more common in male 63%, and less in female 37% [21]. Another previously published study by Singh et al, also shows that renal parenchymal disease is more common in males 58(58%), and less in females 42(42%) [10]. All of the above-mentioned previously published studies and the present study concluded that renal parenchymal disease is most prevalent in males. In the current study, the grading of renal parenchymal disease is made based on the

sonographic appearance. In the current study, the frequencies of sonographic grading of renal cortical echogenicity with Grade 1 had 32(41.0%), Grade 2 28(35.9%), Grade 3 12(15.4%), and Grade 4 6(7.7%). Raju et al, designed a cross-sectional study "Role of renal sonography in the diagnosis of chronic kidney disease" published in 2018 with a sample size of 60 patients and had similar findings with 25 patients who had Grade 1 CKD, followed by 20 patients with grade 2 of CKD, 10 participants with grade 3 of CKD and only 5 patients had grade 4 of CKD [21]. Another study conducted by Singh et al, published in 2016 also presents similar findings as 35 patients who had Grade 1 of CKD, followed by 42 participants with grade 2 of CKD, 16 participants with grade 3 of CKD and only 7 participants had grade 4 of CKD [10]. These previously published studies and current study shows that Grade 1 of chronic kidney disease is most common in patients, followed by Grade 2, Grade 3, and Grade 4 is observed in the least number of patients. The present study shows that blood urea (mg/dl) with a mean value of 92.16 ± 46.88 , serum creatinine of male patients (mg/dl) with a mean value of 6.86 ± 6.18 , Serum creatinine of female patients (mg/dl) with mean value 5.50 ± 5.36 , and glomerular filtration rate with mean value 81.34 ± 23.12 . Similar findings were also observed in previously published studies by Raju et al, as the mean of serum creatinine is 3.36 ± 2.12 and the mean of blood urea is 58.22 ± 22.90 and Vinayaka et.al. mean of serum creatinine is 2.1 ± 0.93 and glomerular filtration rate with mean value as 46.8 ± 30.4 [21].

CONCLUSION

Ultrasound can identify increased echogenicity and reduced cortical parenchymal thickness, as well as reduced renal size. The renal parenchymal disease is most prevalent in elder males. Grade 1 of chronic kidney disease is most common in patients, followed by Grade 2, Grade 3, and Grade 4 is observed in the least number of patients.

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Original Article

Frequency of Uterine Leiomyomas in Multipara Women

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ABSTRACT

Fibroids are typically well-defined solid masses that have a convoluted appearance. These are generally echogenic like the myometrium, though sometimes they can indeed be hypoechoic.

Objective: To determine the incidence of uterine leiomyomas in multipara women in Gujranwala, Pakistan. **Methods:** A cross-sectional study was conducted at the diagnostic department of radiology (DHQ/Teaching Hospital, Gujranwala). The study lasted for three months, from February 24, 2022, to May 24, 2022. A total of 140 people participated in the research after written informed consent. 140 multiparous women with uterine fibroids were included between the mentioned dates. The examination of the patients included pelvic ultrasonography with a full bladder. **Results:** This survey consisted of 140 multiparous women. 100 (64.1%) of 140 females having fibroid uterus who reported to the gynaecology department exhibited submucosal fibroids, 33 (21.2%) contained intramural fibroids, and 23 (14.7%) of them had subserosal fibroids. Fibroids with 127 (81.4%) in the anterior and 29 (18.6%) in the posterior were observed. Menstrual inconsistency was the most prevalent clinical presentation of reported cases, featuring menorrhagia in 105 (75%) patients, polymenorrhagia in 24 (17.1%) patients, and abdominal discomfort in 44 (31.4%) patients, and urinary frequency in 29 (27.9%) women. A total of 47 (33.6%) of the females had a family background of uterine fibroids. **Conclusion:** Submucosal fibroids are the most abundant, followed by intramural and subserosal fibroids, with pedunculated fibroids being the least frequent. The anterior part of the uterus is the most probable site of fibroid emergence. Menorrhagia was the most prevalent symptom.

INTRODUCTION

The uterus is a berry-shaped organ constituted of a fundus, body, isthmus, and cervix [1], each superolateral inclination has a fallopian tube that penetrates above the fundus [2]. Uterine fibroids (UFs) are innocuous smooth muscle growths of the uterus that primarily impact women of reproductive age [3]. They are observed to arise in around 70% of women by the time they hit menopause [4]. Even though the pathogenesis of fibroids is uncertain, there is compelling proof that oestrogens and progesterone stimulate tumour development [5], as leiomyoma seldom develop before menarche and dissipate afterwards menopause [6]. They might be a solitary nodules or a cluster of nodules, and their dimension can range from minute sprouts to colossal masses [7]. They can lead to severe complications, such as substantial or protracted

menstrual flow, pelvic strain or pain, and, in exceptional instances, reproductive problems [8]. Irregular bleeding, pelvic lumps, pelvic irritation, infertility, bulk symptoms, and maternity problems are among some of the clinical manifestations [9]. Fibroids are linked with an increased incidence of the black race, hereditary factors, parity, obesity, polycystic ovary disease [10], and there is preliminary proof that genetic tendency to fibroids is attributed to a specific specimen of clinical features when contrasted to leiomyoma not having genetic predominance [11]. Subserosal (sticking outside the uterus), intramural (inside the myometrium), submucosal (projecting into the uterine cavity), and pedunculated fibroids (fibroids that are attached to the uterus wall by a stalk) are the different types of uterine fibroids based on



their location [12]. The determination of fibroids is conventionally built on observing a dilated, mobile uterus comprising erratic pattern on bimanual assessment or an unintended finding on trans-abdominal sonography [13]. Preoperatively, radiological scanning manners can help support the diagnosis or enhance the localization of a myoma [14]. Ultrasonography is the standard scanning tool for the evaluation of uterine fibroids [15]. Ultrasound should be used foremost because ultrasonography is the least presumptuous and economical inquisition [16]. Abdominal ultrasonography is undertaken with the bladder filled enough to establish a "window" [17]. For the sake of the patient's convenience, vaginal ultrasound studies are conducted with an empty bladder [18]. Depending on the attributes of the growth, uterine fibroids might appear in a range of ways on ultrasound [19]. Fibroids are typically well-defined solid masses that have a convoluted appearance. These are generally echogenic like the myometrium, though sometimes they can indeed be hypoechoic [20]. They might render the uterus appear thick or disrupt the ordinary uterine structure [21]. Although fibroids that aren't cemented could have a proportion of posterior acoustic shadowing [22]. Priorly, uterine leiomyomas were seen as fundamental, particularly as the primary culprit of hysterectomy [23]. The management of uterine leiomyomas can be accomplished in several ways. Operative techniques include hysterectomy, myomectomy, myolysis, MR-guided focused ultrasound surgery, and uterine artery embolization, as well as medicinal alternatives including hormonal therapy and gonadotropin-releasing hormone agonists [24]. Uterine fibroids (UF) are a major health concern that impose a significant monetary impact, with Africans holding the greatest prevalence worldwide [25]. As per the research, methodologically, prevalence estimates in a recent analysis varies from 4.5 to 68.6% [26]. This research will guide us to assess the prevalence of uterine fibroids in multipara women as well as to define where they most likely develop.

METHODS

A cross-sectional study with a sample size of 140 patients [14] having uterine fibroids was undertaken using a purposive sampling technique. This survey was carried out on patients who came to the Gynaecology Department of the DHQ/Teaching Hospital in Gujranwala after written informed consent. The survey was performed for three months, from February 24th to May 24th, 2022. All patients who reported to the gynaecology department with a uterine fibroid and a parity of three or more were included in the research work. Women not having perceptible pelvic growths associated with periodic irregularity, parity less

than three, mass other than uterine fibroid, and ultrasonography-diagnosed ovarian mass were omitted. The pelvic examination was performed using ultrasound machine (Toshiba, Aplio 300) with a curvilinear probe with frequency range of 2-5MHz. IBM SPSS version 26.0 was used to analyse data.

RESULTS

The ages of the patients were ranging from 23 to 60 years old. This research consisted of 140 multiparous women. Table 1 shows that 100 (64.1%) of 140 females with fibroid uterus who reported to the gynaecology department had submucosal fibroids, 33 (21.2%) had intramural fibroids, and 23 (14.7%) had subserosal fibroids.

Type of Fibroid	Frequency	Percent
Submucosal	100	64.1
Subserosal	23	14.7
Intramural	33	21.2
Total	156	100.0

Table 1: Frequency of Uterine Fibroids based on Their Type

Both anterior and posterior regions of the uterus, with 127 (81.4%) in the anterior and 29 (18.6%) in the posterior.

Location of Fibroid	Frequency	Percent
Anterior	127	81.4
Posterior	29	18.6
Total	156	100.0

Table 2: Frequency of Uterine Fibroids based on Their Location

Table 2 demonstrate that fibroids were observed within Table 3 exhibit that the most common reporting problem of patients with uterine leiomyoma in this investigation was menorrhagia in 105 (75%) patients followed by abdominal pain in 44 (31.4%) patients, urinary frequency in 39 (27.9%), and polymenorrhagia in 24 (17.1%) patients.

Presenting Complain	Frequency	Percent
Menorrhagia	105	75
Polymenorrhagia	24	17
Abdominal Pain	44	31.4
Urinary Frequency	39	27.9

Table 3: Frequency of Presenting Complaints of Patients

Figure 1 showcase that a total of 47 (33.6%) of the females had a family history associated with uterine fibroids.

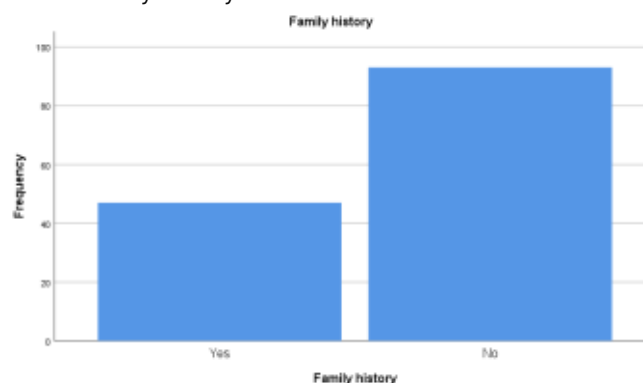


Figure 1: Association of family history with uterine fibroids

DISCUSSION

It was a cross-sectional study with a sample size of 140 patients having uterine fibroids and was carried out on patients who came to the Gynaecology Department of the DHQ/Teaching Hospital in Gujranwala. The survey was performed for three months, from February 24th to May 24th, 2022. All patients who reported to the gynaecology department with a uterine fibroid and a parity of three or more were included in the research work. Women not having perceptible pelvic growths associated with periodic irregularity, parity lesser than three, mass other than uterine fibroid, and ultrasonography-diagnosed ovarian mass were omitted. In present study, 100 (64.1%) of 140 females with fibroid uterus who reported to the gynaecology department had submucosal fibroids, 33 (21.2%) had intramural fibroids, and 23 (14.7%) had subserosal fibroids. Okogbo et al. also stated the same results in their research [27]. The definitive diagnosis of leiomyoma was established based on clinical findings and USGs conducted on all participants in our research. According to Gambone et al., based on the clinical findings, the diagnosis of uterine fibroids can be achieved with around 95% certainty [28]. As per Abraham et al. research, myoma diagnosis is heavily reliant on clinical manifestations, but USG can help validate that the tumours aren't extraneous uterine masses [29]. In current research, the most common reporting problem of patients with uterine leiomyoma was menorrhagia in 105 (75%) patients followed by abdominal pain in 44 (31.4%) patients, urinary frequency in 39 (27.9%), and polymenorrhagia in 24 (17.1%) patients. Considering menorrhagia concerns 9% to 14% of healthy women, many health providers will see patients experiencing menorrhagia-related complications. Uterine fibroids, adenomyosis, DUB, pelvic infection, endometrial polyp, as well as the existence of a foreign body, such as an intrauterine contraceptive device, are believed to be linked to menorrhagia. As per current data, uterine leiomyomas, which probably grow in usually more than 50% of women, are innocuous but can induce several conditions and difficulties. They may, for instance, cause anomalous uterine bleeding, concealing the detection of ovarian tumours and perplexing the administration of menopause. The patients in this analysis were multiparous with parity of three or more. As fibroids are oestrogen-dependent, their aging value is generally from menarche to menopause. They progress slowly and seldom lead to complications until the third decade of life. During this examination, it was determined that multiparous women who were later described with fibroid uterus exhibited a multitude of menstruation issues as well as lower abdominal swelling,

which patients misinterpreted as gaining weight after labour. Menstrual problems prompted them to report to the hospital and have themselves examined. In current study, fibroids were observed within both anterior and posterior regions of the uterus, with 127 (81.4%) in the anterior and 29 (18.6%) in the posterior as stated by Zhang et al, in their study published in 2010 [30]. Another study conducted by JChen et al, published in 2015 also concluded similar results that 3496 fibroids were found in the anterior wall (47.0%) and 2306 in the posterior wall (31.0%) [31]. Present study shows that a total of 47 (33.6%) of the females had a family history associated with uterine fibroids as concluded by Stewart et al. study published in 2017 [4]. A research conducted by Ciebia et al, published in 2016 also showed that positive family history has direct influence in fibroid development [32].

CONCLUSION

The most frequent fibroids seen in patients were submucosal fibroids, trailed by intramural fibroids, and then subserosal fibroids, no pedunculated fibroids were recorded throughout the observation period. Menorrhagia was the most prevalent clinical complaint amongst women with fibroid uterus.

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Original Article

Frequency of Uterine Anomalies Associated with Persistent Miscarriages in Pregnancy on Ultrasound

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ABSTRACT

Miscarriages is when an embryo/foetus expires before the tenth week of gestation. It occurs most commonly early during pregnancy. Women who had a miscarriage looked to be more likely to die before the age of 70 than those who had any other pregnancy outcomes. **Objective:** To determine the frequency of uterine abnormalities related with persistent miscarriages in pregnancy on ultrasound. **Methods:** It was a cross-sectional study conducted over a period of 4 months from February 2022 to May 2022. A sample size of 70 patients was collected using purposive sampling technique. Data was collected from Memorial Christian Hospital Sialkot. Patients with multiple miscarriages due to uterine abnormalities were included in the current study. Patients with less than two miscarriages, self-induced miscarriages and miscarriages due to foetal anomalies were excluded. Data was analysed using SPSS version 20.0. **Results:** The study showed that the mean age of affected women experiencing miscarriage is 28.72. The highest rate of miscarriage was found in 38 (54.3%) of females and least in 4 (5.7%). The common cause of miscarriage was fibroids. Out of 70 females, 34 (48.6%) had fibroids, 14 (20%) had cervical incompetence, 9 (12.9%) had uterine adhesions, 6 (8.6%) had abnormal uterine size, 4 (5.7%) had uterine polyp and remaining 3 (4.3%) had congenital anomalies. **Conclusion:** The study concluded that miscarriages and uterine factors are closely linked. Uterine fibroids have shown the highest percentage of patients that had undergone miscarriage.

INTRODUCTION

A miscarriage, also called as a spontaneous abortion is described as the premature loss of pregnancy in less than 20 weeks of gestation. According to the American College of Obstetricians and Gynaecologists (ACOG), miscarriage is the most frequent type of pregnancy loss. Based on various studies, as much as 26% of pregnancies worldwide, end in miscarriage [1]. Furthermore, more than 80% of early pregnancy loss has been reported to occur in the first trimester of the pregnancy while the total risk of miscarriage mitigates after 12 weeks of gestation [2]. The most common sign of a miscarriage is vaginal bleeding, which is often accompanied by cramping and pain in the lower abdomen [3]. In humans, the process of reproduction

is inefficient [4]. Early pregnancy loss is the most common obstetric complication, affecting more than two-thirds of all human conceptions [5]. Both etiological and uterine problems lead to miscarriage. Genetics, anatomical, endocrine, placental malformations, hormonal issues, infection, smoking, alcohol intake, exposure to environmental variables, psychological trauma, and stressful life events contribute to the etiological factors [6]. Women who have had past miscarriages are at a substantially increased risk of miscarriage [7]. It is expected that 1 out of every 8 pregnancies will result in a miscarriage [8]. According to a new study, women who had a miscarriage looked to be more likely to die before the age

of 70 than those who had any other pregnancy outcomes [9]. The uterus is a muscular, hollow, pear-shaped organ located in the lower part of the pelvis. It lies posterior to the bladder and in front of the rectum, with its base positioned cranially [10]. The size of the uterus varies with age, the profile of hormones, and history of obstetrics. In parous and nulliparous women, the length, width, and anterior-posterior diameter of uterus are 9.07x5.19x4.14 and 7.10x4.52x3.27, respectively [11]. Anatomic abnormalities like mullerian duct and Diethylstilbestrol (DES)-related anomalies can be inherited or acquired. Attained abnormalities include Intrauterine Adhesions (IA) and leiomyoma [12]. Mullerian duct anomalies are found in 8 to 10% of women who have had three or more spontaneous miscarriages in a row and have been evaluated by hysterosalpingography or hysteroscopic examination, whereas hyperprolactinemia has been identified in 30% to 40% of infertile and 15% to 20% of women having menstrual complications [13]. Many pregnancies are genetically defective, resulting in miscarriage, the most common pregnancy problem. Inherited abnormalities (unicornuate, bicornuate, septate, and double uterus), adhesions, cervical incompetence, fibroids/polyps, intrauterine, and endometriosis lead to recurrent second trimester loss [14]. Anatomic abnormalities, which make up 10% to 15% of the incidences of repeated miscarriage by blocking the endometrium's vasculature, resulting in aberrant and inadequate placentation, are the final cause and most widely accepted aetiology [15]. A lower incidence of recurrent pregnancy loss has been linked to malformations such as unicornuate, didelphis, and bicornuate uteruses [16]. Surgical correction of a uterine septum, bicornuate uterus, intrauterine adhesions, fibroids, and cervical incompetence may also result in recurrent pregnancy losses. A preventative cervical cerclage can be beneficial for women who have a Mullerian abnormality and a history of second-trimester pregnancy losses [17]. However, most miscarriages are caused by defects in the viable ovum [18]. Studies have shown that uterine hypoplasia can also cause miscarriage [19]. For three decades, researchers have looked into the cause of recurrent miscarriages, which is linked to polycystic ovarian syndrome [20]. Women with polycystic ovaries are more likely to have numerous miscarriages than women with normal reproductive histories [21]. Uterine fibroids affect up to 40% of women, but their impact on reproductive success is debatable. Incompetence of the cervix is frequently reported as a reason for mid-trimester recurrent losses based on a history of late losses proceeded by spontaneous rupture of membranes and painless cervical dilatation [22]. An accurate diagnosis can be made using a combination of radiologic imaging modalities, ultrasound, trans-vaginal

ultrasonography, hysteroscopy, and laparoscopy [23]. The introduction of high-resolution Trans-Vaginal Ultrasonography (TVS) has completely changed our knowledge of the pathogenesis and management of early pregnancy failure [24]. For the diagnosis and management of early pregnancy failure, recognizing the ultrasonography appearances of normal early pregnancy development and their hazards is critical. The study highlighted the significance of ultrasound in diagnosing the uterine abnormalities that lead to miscarriages. Moreover, the study will also help to determine the frequency of uterine abnormalities that affect women's mental health leading to anxiety, depression, and grief associated with habitual miscarriages.

METHODS

It was a cross-sectional study conducted over a period of four months. A sample size of 70 patients was taken using a purposive sampling technique. Data were collected from Memorial Christian Hospital, Sialkot. A consent form was signed by the patients. The gynaecological examination of the patients was performed in a supine position using a Toshiba Famio 5 ultrasound machine. Patients with multiple miscarriages due to uterine abnormalities were included in the current study. Patients with less than two miscarriages, self-induced miscarriages, and miscarriages due to foetal anomalies were excluded. Data was analysed using SPSS 20.

RESULTS

The study highlighted significance of ultrasound in evaluating the uterine abnormalities that leads to miscarriages. In the present study 70 patients were selected. Table 1 shows the age distribution among females. The mean age of affected females is 28.72.

Patient Age Distribution	N	Minimum	Maximum	Mean±SD
Age of female patients	70	19.00	36.00	28.73±3.89

Table 1: Age distribution of patients

Table 2 shows number of pregnancies in females related with miscarriage. The highest pregnancy number was 3 which was found in 23 (32.9%) females and the least number was 6 found in 5 (7.1%) of females.

Total Pregnancies	Frequency	Percent
Two	10	14.3
Three	19	27.1
Four	23	32.9
Five	13	18.6
Six	5	7.
Total	70	100.0

Table 2: Number of pregnancies

Table 3 shows the frequency of miscarriages in females. The highest rate of miscarriage was found in 38 (54.3%) of females and least in 4 (5.7%).

Table 4 shows the frequency of uterine abnormality

Number of miscarriages	Frequency	Percent
Two	38	54.3
Three	28	40.0
Four	4	5.7
Total	70	100.0

Table 3: Number of miscarriages that leads to miscarriage. The most common among them is fibroids. Out of 70 patients, 34 (48.6%) had fibroids, 14 (20%) had cervical incompetence, 9 (12.9%) had uterine adhesions, 6 (8.6%) had abnormal uterine size, 4 (5.7%) had uterine polyp and remaining 3 (4.3%) had congenital anomalies.

Ultrasound diagnosis of uterine abnormalities	Frequency	Percent
cervical incompetence	14	20.0
uterine adhesions	9	12.9
uterine fibroids	34	48.6
congenital anomalies	3	4.3
abnormal uterus size	6	8.6
uterine polyps	4	5.7
Total	70	100.0

Table 4: Ultrasound diagnosis of uterine abnormalities

DISCUSSION

A miscarriage occurs when an embryo or foetus expires before the tenth week of gestation. It is most prevalent early in pregnancy. Uterine causes account for 8 out of 10 miscarriages. However anatomic abnormalities make up 10% to 15% of the incidences of repeated miscarriage. The current study was conducted on 70 female patients with a history of uterine abnormalities leading to miscarriage. The most frequent neoplasm in the reproductive tract of females is fibroids. The number of women who have or will have fibroids is alarming. It is estimated that 30% of women by the age of 30 will have a fibroid or fibroids, with this percentage rising over time to a total of 50% of females of reproductive age, with racial differences. Subfertility, late conception complications, for example, preterm birth, complications during labour, malpresentation, obstructed labour, dysfunction in contractions of the uterus, and postpartum complications (haemorrhage, sepsis, and uterine involution failure) are all caused by fibroids. The current study found that in 34 (48.6%) patients, fibroids were the leading cause of miscarriages followed by cervical incompetence which contributes 14% to miscarriage. Similarly, according to Hartmann et al, (2017) fibroids are also a major cause of miscarriages, both studies have similar findings having fibroids a leading cause of miscarriage [25]. Kongathi SA et al, discovered in 2013 that uterine abnormalities were responsible for 11.8% of RPL cases. In three out of 35 RPL patients, the uterus account for 10% of our cases of repeated loss of pregnancy [26]. The current study proved that cervical incompatibility is thus linked to miscarriages and found that 14 (20%) of

women miscarried as a result of this issue. Among 23.8 percent of females who had repeated miscarriage, congenital uterine abnormalities were discovered. The arcuate uterus, on the other hand, was the most prevalent aberration, with serious malformations seen in 6.9% of women. Congenital uterine defects were found to be prevalent in women with a history of recurrent early pregnancy loss in previous research. Based on another study, it was also reported that the increased risk of second trimester miscarriage was mostly found in women with arcuate uterus [27]. According to the findings of certain research, the prevalence of significant congenital uterine defects is three times higher in patients with a past of repeated miscarriage than in the general population. This shows that in a tiny percentage of women who have recurrent miscarriages, congenital uterine defects may be the cause of pregnancy loss.

CONCLUSION

The study concluded that miscarriages and uterine factors are closely linked. Uterine fibroids have shown the highest percentage of patients that have undergone miscarriage. Such studies that identify the major factor responsible for recurrent miscarriages can aid in raising awareness and combating the causes in a timely and effective manner.

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