Frequency of Ultrasound in Assessment of Prostate Gland in Different Age Groups

Naveed Hussain, Shanza Khan, Zain Ul Hasan, Muhammad Uzair, Muhammad Yousat Farooq, Aneela Ahmed, Atif Zulfiqar, Sadia Ijaz, and Hamida Ijaz

ABSTRACT

The prostate gland is the main male accessory gland as it secretes fluid that nourishes and protects sperm. With age, the prostate can enlarge. As it surrounds part of the urethra, the enlarged prostate can squeeze the tube. This and some other pathologies of the prostate can cause different problems like urinary retention, impaired kidney feature, recurrent urinary tract infections, gross hematuria, and bladder calculi. This was a descriptive study with a sample size of 200 patients, performed at Gillani Ultrasound Center Lahore and The University Ultrasound Clinic Green Town Lahore from July till November 2021. Individuals of all ages above 23 years of age were diagnosed with all pathologies of the prostate. The patients with UTI, cystitis or bladder stone were not considered in this research. Transabdominal sonography was performed with the convex transducer of 3.5-5 MHz frequency. In this descriptive study, the total sample size of the study was 200 from which BPH was found in 142 Patients 71%, BPH with prostatic cyst was in 6 patients 3%, Prostatic calcification was in 14 patients 7%, BPH with prostatic calcification was in 11 patients 5.5%, Prostatic cancer was in 1 patient 0.5% and the prostatic cyst was in 26 patients that are 13% of the sample size. Ultrasound has been proven to diagnose early prostatic enlargement and other prostate-related pathologies, our study concluded that BPH is the most common pathology ranging between 50 to 60 years, and prostatic cyst and calcification were common in ages 23 to 35.

Keywords: Age groups, prostate ultrasound.

I. INTRODUCTION

The prostate gland is an unpaired partly glandular and partly fibromuscular structure located deep in the lesser pelvis; the proximal part of the male urethra and the ejaculatory ducts [1]. The prostate has 4 special anatomical zones specifically the peripheral sector, vital zone, transitional quarter, and anterior sector [2]. The prostate gland is commonly defined as being the size of a walnut [3]. Roughly two-thirds of the prostate is glandular in structure and the remaining third is fibromuscular [4]. The gland itself is surrounded by a thin fibrous capsule of the prostate [5]. The human prostate is composed of glandular and stromal elements, tightly fused within a pseudo capsule. The inner layer of the prostate capsule is composed of smooth muscle with an outer layer covering collagen [6]. The normal prostate gland measures 3×3×5 cm, volume of 25 ml [7]. Traditionally, the prostate is divided into anatomical lobes (inferoposterior, inferolateral, superomedial, and anteromedial) [8].

Prostate sonography produces black-and-white snapshots of your prostate by means of bouncing sound waves off your body’s tissues [9]. This test is used to examine your prostate for the presence of any abnormalities, cancer, or different prostate-related conditions. This examination is safe and secure and can be executed in less than an hour [10]. Ultrasound helps to diagnose symptoms such as difficulty urinating. It is also used to investigate nodules found during a rectal exam, detect abnormalities, and determine whether...
the gland is enlarged [11]. Because ultrasound provides real-time images, it can also be used to guide procedures such as needle biopsies, in which a needle is used to take sample cells (tissue) from an abnormal area in the prostate gland for later laboratory testing [12]. The specificity and sensitivity of grayscale TRUS in the detection of prostate cancer are relatively low [13]. Prostate cancer most commonly appears as a hypoechoic focal lesion in the peripheral areas on TRUS but the appearances are variable with vast overlap with benign lesions [14]. Mostly we used transabdominal ultrasound for the measurement of the prostate gland which is a cheap and convenient method [15]. For this procedure first of all patient’s bladder should be full then the patient should lay in the supine position, and we use a convex probe of 3 to 5 MHz [16]. In transabdominal ultrasound for the prostate gland, we take a total of three measurements one in transverse view and the other two in longitudinal view. Prostate volume is the sup of these three measurements [17]. A healthy person's prostate volume is equal to 25 to 30 ml if the value increases it is an indication of benign prostatic hyperplasia [18].

II. MATERIALS AND METHODS

This was a descriptive study with a sample size of 200 patients, performed at Gillani Ultrasound Center Lahore and The University Ultrasound Clinic Green Town Lahore. Individuals of all ages above 25 years of age were diagnosed with all pathologies of the prostate. The patients with UTI, Cystitis, or bladder stone were not considered in this research. Transabdominal sonography was performed with the convex transducer of 3.5 - 5MHz frequency. This study was done 4 months after the approval of the synopsis from July 2021 to November 2021. This descriptive study was done with a sample size of 200 patients. The technique used for this study was convenient sampling. All the male patients with 23 years and above. All the male patients with an aged lesser than 23 years.

III. RESULTS

Out of 200 Patients, BPH was in 142 patients which is the 71% percentage of the sample size, BPH with prostatic cyst was in 6 patients which is the 3% percent of the sample size, and Prostatic Calcification was in 14 patients which is the 7% percent of the sample size, BPH with prostatic calcification was in 11 patients which is the 5.5% percentage of the pattern size, prostatic cancer was in 1 patient which is the 0.5 percent of the sample size and the prostatic cyst was in 26 patients which is the 13% percent of the sample size.

<table>
<thead>
<tr>
<th>TABLE I: DESCRIPTIVE STATISTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
</tr>
<tr>
<td>Valid N (list wise)</td>
</tr>
<tr>
<td>Prostate</td>
</tr>
<tr>
<td>Volume Valid N</td>
</tr>
</tbody>
</table>

In [20], 466 male patients were examined. BPH was in 104 patients 22.3%, Inflammation was in 88 patients 18.4%, right lobe cancer was in 38 patients 8.2%, left lobe cancer was in 37 patients 7.9%, bilateral cancer was in 145 patients 31.1%, right lobe cancer with inflammation was in 28 patients 6.0% and left lobe cancer with inflammation was in 26 patients 5.6%. In our study 200 patients were examined. BPH was in 142 Patients 71%, BPH with prostatic cyst was in 6 patients 3%, prostatic calcification was in 14 patients 7%, BPH with prostatic calcification 11 patients 5.5%, prostatic cancer was in 1 patient 0.5% and prostatic cyst was in 26 patients 13%.

In [21], a total of 101 men (out of 1374 screened) were found to have prostatic lithiasis. The prevalence of prostatic lithiasis in our series accounted for 7.35%. Mean age (range) of the patients was 40.9 (21–50) years. Seventeen patients (16.83%) were tested with TRUS. Statistics were classified as type A or B in 72/110 (71.3%) and 29/101 (28.7%) patients respectively. Type A calculi presented with peripheral in 28.8%, central in 28.8%, and diffuse distribution in 42.4% of the cases. Similarly, type B calculi was peripheral in 15%, central in 50%, and distributed in 35% of the cases. Thirty-three patients (32.7%) were presented with at least one symptom from pain, nocturia, urgency, painful ejaculation, and frequency. A total number of 29 men (28.7%) filled the criteria of chronic prostatitis syndrome. In our study, 200 patients were diagnosed with the age range between 23 to 95 years, and the mean age of our study was 52.93 years, the volume range of our study was between 9.1g to 98.40g and the mean volume of our study was 42.92g. There were 7 groups created in our study 23-35, 36-45, 46-55, 56-65, 66-75, 76-85, and 86-95, the number of patients examined in each group respectively was 32, 34, 44, 48, 26, 11 and 5. The highest number of patients were examined in the age group 56-65 and the lowest number of patients were examined in the age group 86-95; the number of patients was 48 and 5 respectively.

In [22], they dealt with 156 patients of different ages; the minimum age was 56 years and the maximum was 83 years.

IV. DISCUSSION

Reference [19] did research on the topic “Prevalence of Symptoms of Benign Prostatic Hyperplasia in Umudike and its Relationship with Measures of Obesity” in 2015. In this study, their age groups were 40-49, 50-59, 60-69, and 70+ years and our age groups were 23-35, 36-45, 46-55, 56-65, 66-75, 76-85, and 86-95 years. In their study, BPH was discussed in 3 different categories: mild, moderate, and severe with percentages respectively 64.2, 30.4, and 5.02. In our study, BPH was found in 71% of the sample size. In their age group, 40-49 BPH was discussed in 3 different categories mild, moderate and severe respectively 94%, 6.0% and 0.0%, age group 50-59 BPH was discussed in 3 different categories mild, moderate and severe respectively 73%, 24.5% and 2.6%, age group 60-69 BPH was discussed in 3 different categories mild, moderate and severe respectively 51.2%, 42.4% and 6.4% and age group 70-up BPH was discussed in 3 different categories mild, moderate and severe respectively 30.1%, 57.1% and 12.9%. And in our age group 23-35 BPH was 12.5%, age group 36-45 BPH was 82.4%, age group 46-55 BPH was 75.0%, age group 56-65 BPH was 87.5%, age group 66-75 BPH was 92.3%, age group 76-85 BPH was 63.6% and age group 86-95 BPH was 80.0%.

In [20], 466 male patients were examined. BPH was in 104 patients 22.3%, Inflammation was in 88 patients 18.4%, right lobe cancer was in 38 patients 8.2%, left lobe cancer was in 37 patients 7.9%, bilateral cancer was in 145 patients 31.1%, right lobe cancer with inflammation was in 28 patients 6.0% and left lobe cancer with inflammation was in 26 patients 5.6%. In our study 200 patients were examined. BPH was in 142 Patients 71%, BPH with prostatic cyst was in 6 patients 3%, prostatic calcification was in 14 patients 7%, BPH with prostatic calcification 11 patients 5.5%, prostatic cancer was in 1 patient 0.5% and prostatic cyst was in 26 patients 13%.

In [21], a total of 101 men (out of 1374 screened) were found to have prostatic lithiasis. The prevalence of prostatic lithiasis in our series accounted for 7.35%. Mean age (range) of the patients was 40.9 (21–50) years. Seventeen patients (16.83%) were tested with TRUS. Statistics were classified as type A or B in 72/110 (71.3%) and 29/101 (28.7%) patients respectively. Type A calculi presented with peripheral in 28.8%, central in 28.8%, and diffuse distribution in 42.4% of the cases. Similarly, type B calculi was peripheral in 15%, central in 50%, and distributed in 35% of the cases. Thirty-three patients (32.7%) were presented with at least one symptom from pain, nocturia, urgency, painful ejaculation, and frequency. A total number of 29 men (28.7%) fulfilled the criteria of chronic prostatitis syndrome. In our study, 200 patients were diagnosed with the age range between 23 to 95 years, and the mean age of our study was 52.93 years, the volume range of our study was between 9.1g to 98.40g and the mean volume of our study was 42.92g. There were 7 groups created in our study 23-35, 36-45, 46-55, 56-65, 66-75, 76-85, and 86-95, the number of patients examined in each group respectively was 32, 34, 44, 48, 26, 11 and 5. The highest number of patients were examined in the age group 56-65 and the lowest number of patients were examined in the age group 86-95; the number of patients was 48 and 5 respectively.

In [22], they dealt with 156 patients of different ages; the minimum age was 56 years and the maximum was 83 years.
In the overall study they discussed 2 categories, prostate cancer and BPH. Prostate cancer was found in 34 patients that makes 22%, the mean age was 69 years and mean volume was 39.2g and BPH was found in 122 patients that makes 78%, the mean age was 67 years and mean volume was 37.8g. In our study there were 200 patients of different ages in which the minimum age was 23 years, maximum age was 95 years, and the mean age was 52.93 years. The second column shows the mean age was 52.93 year. The minimum volume was 9.10g and the maximum volume was 98.40g, the mean volume was 42.92g and in our study BPH was in 142 patients 71%, Prostatic calcification was in 14 patients 7%, and prostatic cancer was in 1 patient 0.5% of the overall study.

V. CONCLUSION
The minimum age of the patient was 23 years recorded and the maximum age of the patient was 96 years recorded so the mean age was 52.93 years. The second column shows the descriptive statistics of prostatic volume of patients of our study, minimum prostatic volume calculated was 9.10g and the maximum prostate volume calculated was 98.40g so the mean prostate volume was 42.92 grams.

CONFLICT OF INTEREST
Authors declare that they do not have any conflict of interest.

REFERENCES