

## **Original Research Article**

### **Sonographic Findings of Prostate in Saudi Population**

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**Abstract:** Ultrasound is the tool of choice in detection of abnormal prostatic finding and diagnosis of prostate enlargement. BPH is common prostatic disorder causing enlargement with sever complication in prostate due to endocrine imbalance which is usually benign at the 5<sup>th</sup> decade and continuous through the life. The objective of this study to show the different ultrasound finding of prostate and detection of normal and abnormal prostatic finding and any changes in echotextures of the prostate in the Saudi population with age group ranged between 40 years to 80 years old in Taif city. The data were collected from scanning patient in the duration extend from August 2015 to November 2015. A total of 100 male patients selected randomly symptomatic and asymptomatic of prostatic abnormalities came to different Hospitals and diagnostic centers in the Taif city KSA for Abdomen and pelvic ultrasound examination. The common pathology of this study especially among the elderly population is BPH then Prostatitis, and calcification changes. The ultrasound has high accuracy in prostatic pathology especially in measuring the volume of prostate. The incidence of BPH is increase direct proportionally with age. The good quality of ultrasound machines and good preparations of the patient give better results. History, care, and good preparations of the patients, and others investigation result more important and help in diagnosis of diagnosis of Benign prostate hypertrophy(BPH).

**Keywords:** ultrasound, prostate gland.

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#### **INTRODUCTION**

The study is performed for scanning the Saudi population, which is seek to the different prostatic ultrasound finding indicating normal, abnormal, and any changing in echotextures of prostate due to aging, pathology and any other factors. The result of the previous study done by Amer Awad Ahmed Elhaj[14], he shown that The prostate enlarged gradually with age and some prostate enlarged but were not symptomatic, other prostate enlarged and symptomatic but has no complain. So the percentage of prostate gland enlargement (39%). This study result of (35%) of prostatic enlargement increase with gradually with age and also the peak incidence of enlargement elderly age group (79-80) years.

The importance of the study can show the useful of ultrasound in determine prostatic volume. Particularly in patients with symptoms of prostates, and the volume or weight cannot be estimated well by digital palpation, because the growth of the gland is primarily anterior. So the Surgeon performs an open prostatectomy in gland that are larger than 60 to 80 g. In addition, preoperative sonographic evaluation of the bladder and kidneys can be performed. Ultrasound can

analyze the effect of the hyperplasia on the anterior urethra and assess “median lobe” enlargement.

Often, very large glands may be seen in asymptomatic patients, whereas patients with severe symptoms of prostate have only enlargement anteriorly and centrally [9]. Patients with benign prostatic hyperplasia often have glands that are abnormal to palpation. The role of ultrasound in these patients to separate benign from malignant lesions and to guide biopsies when this distinction cannot be made sonographically [9].

A patient with a hard nodule that is felt by digital rectal examination and that contains calcification with shadowing can be spared an unnecessary biopsy if the palpable lesion corresponds to that seen with ultrasound[6]. Diseases of prostatic are common cause of urinary problem in men, particularly beyond 60 years. Most prostatic disease cause enlargement of the organ are prostatic hyperplasia and prostatic carcinoma resulting in compression of the intraprostatic portion of urethra; this leads to serious clinical problem, cause retention of urine requiring urgent relief by catheterization[15]. The volume or weight cannot be

estimated well by digital palpation in the patients with symptoms of prostatic disease.( only enlargement anteriorly)The incidence of enlarged prostate glands with asymptomatic patients[9].

### Objectives

- To examine the value of ultrasound in detecting normal and abnormal prostatic findings, and diagnosis of prostatic enlargement.
- To evaluate the incidence of other different ultrasound findings of prostate.

### RESEARCH METHODOLOGIES

The study was analytic descriptive study, took place at different Hospitals in Taif city KSA, in duration extended from August 2015 to November 2015.

A total of 100 male patients symptomatic and asymptomatic of prostatic abnormalities came for Abdomen and pelvic ultrasound examination. They were selected randomly from the Saudi population with age group ranged between 40 years to 80 years old.

This study has a three variable which are patient's age as independent variable, PSA, and prostate volume as dependant variables. All data were collected from the clinical finding, and sonographic finding. The clinical finding is related to common prostatic problems which

are affected the sonographic finding of prostate. The sonographic finding including the prostatic echotextures, volume, and different prostatic abnormalities during ultrasound examination. The data were analysis by different statistic formulas (chi square and t-test)

### Instrumentation:

All patients were scanned with experience sonologist in different approach with different ultrasound machines with (TAS) transducer:

- Medison SA – 8000 (3.5MHz, TA convex probe)
- Shimadzu SSD-2200(3.5MHz, TA convex probe).
- Aloka (3.5MHz, TA convex probe).
- Technique and patient preparation

Transabdominal scanning was done with patients lying supine with full bladder both transverse and longitudinal approach was done by putting the probe in at the midline of the body, just superior to the symphysis pubis.

Longitudinal scanning :) Sagittal plane and anterior approach):

1. Begin with the perpendicular, at the midline of the body, just superior to the symphysis pubis.
2. Angle the transducer inferiorly to visualized the prostate in long axis. Note the bladder anteriorly.
3. The length of prostate measurement was taken from longitudinal view. (fig 1).

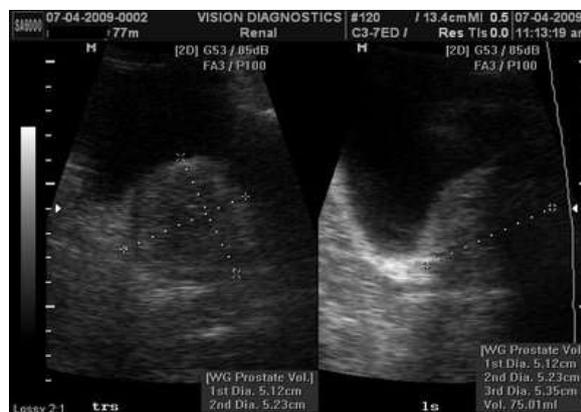
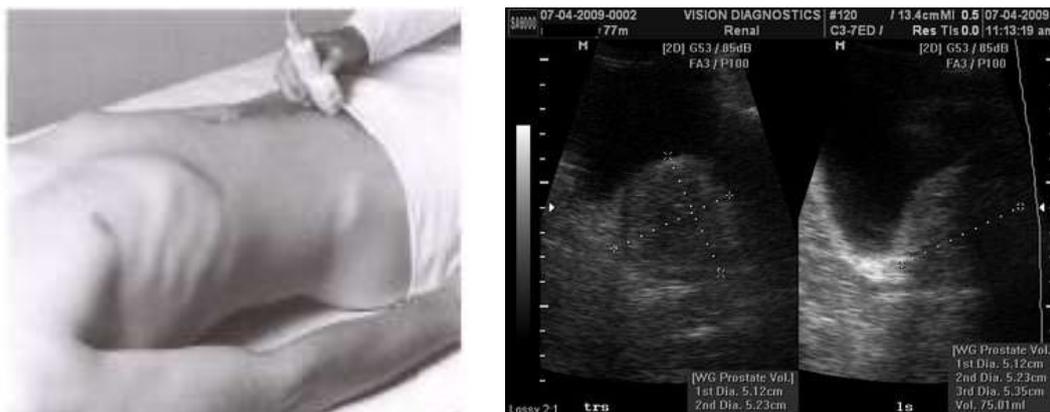


Fig-1: longitudinal view of prostate illustrated how the measurement was taken. [17]

### Transverse scanning:

Transverse plane anterior approach:

1. From the longitudinal approach rotate the transducer 90 degree into the transverse scanning plane to transverse the prostate.
2. Begin with the transducer angled inferiorly, at the midline of the body, just superior to the symphysis pubis.
3. Angle the transducer slowly inferiorly, looking to the seminal vesicles.
4. Angle the transducer more inferiorly, looking to the prostate in transverse axis. Note the bladder anteriorly, rectum posteriorly, and the side walls.



**Fig-1: Transverse view of illustrated how the measurements were taken. [17]**

**Prostate measurements and volume:**

Three measurements were taken from two approach (L x W x thickness) prostatic volume can be measured with transabdominal approach using formula: 0.523(L x W x thickness) of gland. Standard international volume measurement:

The normal prostate volume less than 30 gm or ml

**RESULTS**

The common pathology of this study is Benign Prostatic Hyperplasia BPH (35%) especially among the elderly population, then calcification changes (13%), Prostatic cancer (3%), and Prostatitis (2%). The peak incidence of high frequent pathology (BPH) is around

the age group of 70-80 years, so the enlargement of prostate is usually presenting in men by age of 50 years and rises progressively with age.

- The incidence of BPH is increase direct proportionally with age.
- The ultrasound has high accuracy in prostatic pathology especially in measuring the volume of prostate, indicating the degree and site of enlargement.
- This study indicates there is greater incidence of prostatic enlargement.
- There was 97.14% of BPH present with abnormal micturition and 2.86% present with normal micturition.

**Table-1: shows: the frequency of all cases in age groups**

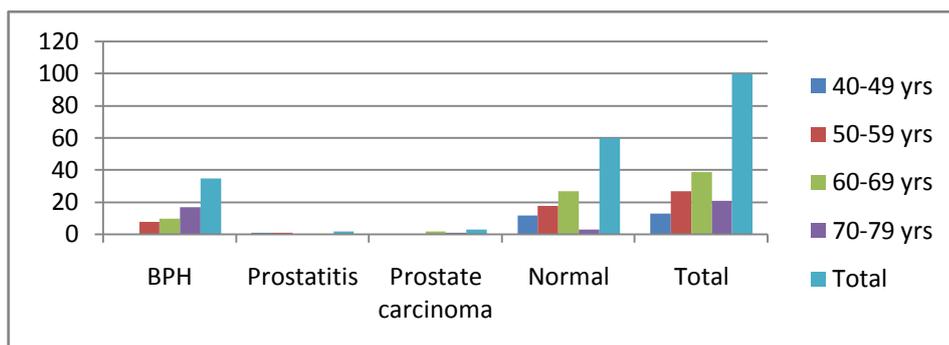
**AGE\_GROU \* BPH Crosstabulation**

Count		BPH		Total
		Yes	No	
AGE_GROU	40-49		13	13
	50-59	8	19	27
	60-69	10	29	39
	70-79	17	4	21
Total		35	65	100

**Table-2: shows: the frequent of BPH cases in age groups**

**AGE\_GROU**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 40-49	13	13.0	13.0	13.0
50-59	27	27.0	27.0	40.0
60-69	39	39.0	39.0	79.0
70-79	21	21.0	21.0	100.0
Total	100	100.0	100.0	



**Fig-3: show: Tables of frequent of abnormal cases in age groups**

The result of study shows that the most frequent pathology is Benign prostatic hyperplasia BPH.

**Table -3: shows: Cross tabulation between BPH & patients with abnormal micturition**

**PSA \* BPH Crosstabulation**

Count		BPH		Total
		Yes	No	
PSA	Yes	12	6	18
	No	23	59	82
Total		35	65	100

**Table-4: shows: Cross tabulation between BPH & PSA**

**MICTURAT \* BPH Crosstabulation**

Count		BPH		Total
		Yes	No	
MICTURAT	Yes	34	50	84
	No	1	15	16
Total		35	65	100

There was 97.14% of BPH present with abnormal micturition and 2.86% present with normal micturition. There was 66.7% of BPH present with elevated PSA and 33.3% present with normal PSA

**Table-5: shows: Correlation between age groups, PSA, and prostate volume in cases**

**Correlations**

		AGE	PSA_NUM	PROST_VO
AGE	Pearson Correlation	1	.447**	.439**
	Sig. (2-tailed)	.	.000	.000
	N	100	100	100
PSA	Pearson Correlation	.447**	1	.274**
	Sig. (2-tailed)	.000	.	.006
	N	100	100	100
PROST_VO	Pearson Correlation	.439**	.274**	1
	Sig. (2-tailed)	.000	.006	.
	N	100	100	100

\*\* . Correlation is significant at the 0.01 level (2-tailed).

## DISCUSSION

The results of study show that the enlargement of prostate is most common pathology which increases with age, and the other pathology is low incidence. The calcification changes are also low and due to aging or associated with pathology.

The most prostatic pathology with enlargement of prostate is associated with abnormal micturition. The of result shown that there is 84% of the all patients present with abnormal micturition, and 97.14% among the patients with BPH present with abnormal micturition to only 2.86% present with normal micturition. Also there was 66.7% of BPH present with elevated PSA and 33, 3% present with normal PSA

There is a significant correlation between age incidence, and PSA level and the volume of the prostate at  $p = 0.05$  with a correlation coefficient  $r = 0.5$  and  $0.44$  respectively. This association dictates a direct relationship between the PSA level, volume of the prostate and the age. Correlation is significant at the 0.01 level tables (4-5). In slightly disagreement with previous study done by Mutaz Ibrahim Yasien Ahmed[15], he was shown that the BPH peak in age group of (60-69 years) which is differ from this study results which shown that the BPH peak in age group of (70-80 years).

In agreement with previous study[16] Intravesical protrusion of the prostate as a predictive method of bladder outlet obstruction: shown Intravesical protrusion of the prostate (IPP) and prostatic volume measured through abdominal ultrasound are noninvasive and accessible methods that significantly correlate to urinary bladder outlet obstruction (BOO), and are useful in the diagnosis of male urinary obstructive problems. Regarding to high percentage of the patients (84%) in this study presented with abnormal micturition especially those with BPH (97.14%) present with abnormal micturition, there is significant correlation between BPH and abnormal micturition due to partially or obstruction in urine pathway.

The second pathology in this study is prostatic carcinoma with (3%) incidence. The patients scanned have all feature of prostate cancer and the fact that we must know is, that all of patients are already diagnosed before coming for ultrasound scan and they came for follow up, because the transabdominal Scan TAS dose able to differentiate between malignant and benign prostate tumors. Trans Rectal Scan TRS is better than TAS, because it more details about the zones and lobes of the prostate.

All of the cases of prostate cancer in this study have elevated Prostate Specific Antigen PSA and Abnormal Digital Rectal Examination ADRE.

The study shown (2%) of patients have prostatitis, one age group of (40-49years) and anther in (50-59 years).

The calcification changes is (13%) most of them in elderly age of group (70-80years) and other in group (60-69years).

## CONCLUSION

1. The study is done TAS, so that all of diagnosis depening on the measuring and general ultrasound features.
2. The ultrasound has high accuracy in prostatic pathology especially in measuring the volume of prostate.
3. The limitation of ultrasound in differentiation between benign and malignant tumors by using Trans Abdominal Scan.
4. The common pathology of this study in Saudi population especially among the elderly population is Benign Prostatic Hyperplasia BPH (35%) then Prostatitis (2%), Prostatic cancer (3%), and calcification changes (13%).
5. The incidence of BPH is increase direct proportionally with age.

## Recommendations

1. To stop limitation of prostate ultrasound, all ultrasound departments in our Hospital must use TRS especially for prostate scan.
2. The good quality of ultrasound machines and good preparations of the patient give better results.
3. History and care of the patients and others investigation result more important and help in diagnosis

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