



## DETERMINING THE EFFICACY OF TRANS RECTAL ULTRASOUND (TRUS) IN CASES OF PROSTATIC PATHOLOGY WHEN COMPARED WITH HISTOPATHOLOGICAL EXAMINATION OF PATIENTS COMING FOR TREATMENT IN RAJENDRA INSTITUTE OF MEDICAL SCIENCES (RIMS) RANCHI.

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### ABSTRACT

**Background** Diseases primarily affecting the prostate gland in men range from inflammation, benign hyperplasia, to malignant tumors. Prostatic Carcinoma is the most common non dermal cancer in the west and second leading cause of death among men. India has seen an increase in the incidences of prostatic pathology in various forms be it BPH or Ca Prostate owing to increased imaging facilities and awareness among doctors including the patients. The diagnosis is often achieved with a combination of imaging modality, histopathological exam, lab indicators and clinical examination. This study was intended to ascertain the efficacy of diagnostic value for Trans rectal Ultrasound in comparison to histopathological findings.

**Methodology** 110 patients coming for USG in the Radiology department were evaluated and their results matched with those obtained after Histopathological examination during the study period starting January 2017 to December 2017 in Rajendra Institute of Medical Sciences after prior approval from IEC and Consent from the patient.

**Results** We obtained the diagnostic value of TRUS as specificity 77.78% with 95% CI of 67.71% to 86.27% while sensitivity was 89.66% with 95% CI 72.65% to 97.81%, negative predictive value of the TRUS was calculated as 95.45% with 87.73% to 98.41%. The overall accuracy was 80.91% with a 95% CI 72.31% to 87.78%.

**Conclusion** The present findings suggest that TRUS and Histopathological Examination coupled can be an effective tool to diagnose the prostatic pathologies prevalent in this area. The high Negative Predictive Value can avoid unnecessary diagnostic interventions.

### KEYWORDS :

#### Introduction

Prostate gland in men is inflicted primarily from inflammation, benign nodular hypertrophy and tumors, malignant being the gravest. (1) Benign hyperplasia/hypertrophy affects men commonly in age greater than 50 years. Some 210 million males are roughly affected. (2) Prostatic Carcinoma being the most common non dermal cancer in west and second leading cause of death due to cancer all over the globe (3). Off late with advancement in better health care services owing to enhanced imaging modality access, better labs etc., last 25 years has seen increase in Asia for Prostatic Ca in men greater than 65 Years. As per official records of Government of India ( National Cancer Registry ) the Ca Prostate ranks somewhere between 2nd to 8th with evidence on the rise. (4)

In 1967 first clinically acceptable images of the prostate was obtained using Trans rectal Ultrasonography (TRUS) by Wanabe which was hailed as a major breakthrough in the diagnostic and treatment options for Ca Prostate. (5) With the advancement of technology now TRSU coupled with Biopsy is the standard technique in diagnosis of Prostatic Ca and other pathology, along with DRE the diagnostic values are increased. That's primarily the reason why now it's the integration of TRUS findings with DRE ( Digital Rectal Examination ), PSA ( Prostatic Specific Antigen ) along with histopathological correlation to diagnose the prostatic pathology.

With an aim to measure the diagnostic value of TRUS used in isolation as compared with Histopathological Examination in isolation for all prostatic pathology, this study was carried out in the apex tertiary institute of the state i.e Rajendra Institute of Medical Sciences in Ranchi, Jharkhand. (6)

#### Objectives of the Study

(1) To determine the diagnostic efficacy of TRUS in comparison

with histopathological examination.

(2) To determine the nature of Prostatic Pathology in the patients examined.

#### Methodology

The present study was done in Radiology department of Rajendra Institute of Medical Sciences (RIMS) starting January 2017 till December 2017. Prior approval from IEC was taken. This was a prospective observational study done on 110 patients, where Trans rectal Ultrasonography results were compared with histopathological examination reports obtained for the same patients after biopsy. Inclusion Criterion – All consent giving patients were included while those who were not willing to participate were excluded. The standard protocols were followed for the patient's position for sheath wrapped 6.5 MHz probe to be inserted. Prostate gland was evaluated for the presence of any focal lesions including their echo pattern, capsular integrity, extension of the pathology outside the gland margin limit.

Pathology involving enlarged prostate gland with or without median lobe enlargement showing symmetric echogenicity along with heterogeneous echotexture of inner glandular zone was considered as benign prostatic hyperplasia (BPH) on TRUS. While normal or large gland with presence of focal lesions in peripheral zone with or no capsular breach was considered as prostatic carcinoma on TRUS.

These results were compared with histopathological examination of whole mount sections of biopsy samples.

#### Results

The patients were of age range 58-75 years with mean age 61.4±5.78 years. Majority were below 66 years (59%) In our study we found 44 cases to be suggestive of Ca Prostate and 66 cases to be

having BPH , using TRUS while on Histo- pathological Examination Ca Prostate was confirmed in only 29, (Table 1). This gave the diagnostic value of TRUS as specificity 77.78 % with 95% CI of 67.71% to 86.27% while sensitivity was 89.66% with 95% CI 72.65% to 97.81%, negative predictive value of the TRUS was calculated as 95.45% with 87.73% to 98.41%. The overall accuracy was 80.91% with a 95% CI 72.31% to 87.78%. (Table 2)

	Final Result Based on Histopathological Examination for Ca tate		Total
	Positive	Negative	
TRUS (Trans Rectal Ultrasonography)			
Positive	26 ( True Positive)	18 (False Positive )	44
Negative	3 ( False Negative)	63 (True Negative)	66

**Table 1 . Comparison of Results obtained through TRUS compared with Histopathological Examination**

Statistic	Value	95% CI
Sensitivity	89.66%	72.65% to 97.81%
Specificity	77.78%	67.17% to 86.27%
Disease prevalence	26.36%	18.42% to 35.62%
Positive Predictive Value	59.09%	48.55% to 68.86%
Negative Predictive Value	95.45%	87.73% to 98.41%
Accuracy	80.91%	72.31% to 87.78%

**Table 2. The various diagnostic test values for TRUS like Sensitivity, Specificity, Negative Predictive Value and Accuracy calculated using standard formulae.**

	Benign Prostatic Hyperplasia n=72	Percentage BPH+ % N=72	Percentage Prostatitis n=9	Ca Prostate n=29	Percentage % N=29	
Hypoechoic	29	40.28	3	33.33	14	48.28
Hyperechoic	8	11.11	4	44.44	0	
Mixed	9	12.50	2	22.22	4	13.79
Hypo+ Hyperechoic	10	13.89			5	17.24
Hypo + mixed	7	9.72			1	3.45
Hyper +Mixed	0	0.00			2	6.90
Hypo +Calcification + Mixed	2	2.78			2	6.90
Hyper +Mixed+ Calcification	3	4.17				
Mixed +Calcification	0	0.00	0			
Hypo+ Hyperechoic +Mixed	1	1.39				
Hypo + Hyper +Calcification +Mixed	1	1.39				
Hypo+ Calcification	2	2.78				
Hyper +Calcification	0	0.00			1	3.45
	72		9		29	

**Table 3 . Various Prostatic Pathologies on TRUS and their sonographic echopattern.**

It was seen that BPH was involving predominantly the inner glandular zone while Ca Prostate involved peripheral zone.

Hypochoic lesion were most common in both Ca Prostate and BPH followed by hypochoic plus hyperechoic lesions. (Table 3).

**Discussion**

The present study determined sensitivity and specificity of TRUS to be 89.66% 77.78% respectively. A negative predictive value of 95.45% puts TRUS in good light regarding its diagnostic value but not good enough to employ it as a diagnostic test.

These results are similar to cited evidence by Griffith , Wolfhang , R mallik , Beyersdroff found elsewhere .(7,8,9,10,11) We concluded that using TRUS as a visual tool to have a clear picture of Prostate gland is immensely feasible and viable option in our current setting .As has been noted by Mona et al TRUS has its own set of limitations to be taken as a diagnostic tool in isolation and that's the reason why they advocated use of TRUS +Doppler +PSA Level + DRE and Integrated Approach ( 12 ) . Recent evidence also suggest an integrated approach for better diagnostic efficacy. (13)

**Conclusions**

The present findings suggest that TRUS and Histopathological Examination coupled can be an effective tool to diagnose the prostatic pathologies prevalent in this area. The high Negative Predictive Value can avoid unnecessary diagnostic interventions. However given the small sample size further research is mandated with integration of Lab samples and DRE as well.

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