



## RELATIONSHIP BETWEEN GRADES OF PROSTATOMEGALY ON DRE AND PROSTATE VOLUME ON SONOGRAPHY WITH LOWER URINARY TRACT SYMPTOMS: TO BELIEVE YOUR FINGER OR THE ULTRASOUND PROBE!!!

### Surgery

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### ABSTRACT

Elderly men presenting with Lower Urinary Tract Symptoms (LUTS) constitutes around a third of urological practice with prevalence as high as 10-41 % in men older than 40 years. Its adverse impact on the Quality of Life (QoL) makes it imperative for the clinician to guide therapy based on sound diagnostic principles. Clinical evaluation of LUTS secondary to BPH involves International Prostate Symptom Score (IPSS) assessment, digital rectal examination (DRE), urodynamics and sonological evaluation of prostate. Our study aims to correlate the grades of prostatomegaly on DRE and prostate volume on sonography with LUTS assessed by IPSS in elderly males.

### KEYWORDS

LUTS, BPH, IPSS

#### Introduction:

Elderly men presenting with Lower Urinary Tract Symptoms (LUTS) constitutes around a third of urological practice with prevalence of LUTS as high as 10-41 % in men older than 40 years(1). The prevalence of LUTS increases with age with >30 % men aged more than 80 years reporting to surgical clinics due to adverse impact on their quality of life(2). Various questionnaire-based scoring systems are in practice for assessment of severity of LUTS in males, of which the most widely validated is the AUA symptom index modified by World Health Organisation – International Prostate Symptom Score(3). Although, a differential diagnosis of LUTS would include urological and neurological diseases, LUTS with some degree of prostate enlargement is provisionally diagnosed as Benign Prostatic Enlargement (BPH)(4). Clinical evaluation of LUTS secondary to BPH would include thorough physical examination, laboratory evaluation involving urine analysis, urodynamic evaluation, sonological imaging of the prostate and direct visualisation by cystourethroscopy in selected patients(5). A meticulous digital rectal examination (DRE), albeit a fairly long learning curve and inter-observer variance, is the cornerstone of clinical examination for BPH(6). Further, ultrasonography is routinely used for evaluation of prostate volumes in patients with BPH. Dynamic and observer dependent factors contribute to errors in the observed volume of prostate on Trans abdominal sonography (TAUS)(7). The objective of our study was to correlate independently the relationship between grades of prostatomegaly assessed by clinical examination and prostate volumes measured by transabdominal ultrasound for prostate with severity of LUTS.

**Materials and methods:** The study was carried out on elderly male patients attending the general surgery clinic of a tertiary care hospital with the approval of the institutional ethics committee. A total of 100 patients were enrolled using appropriate inclusion and exclusion criteria enumerated below. All male patients aged more than 50 years with lower urinary tract symptoms were included in the study group. All patients with history suggestive of urinary tract infections in the recent past, history of urethral instrumentation and urological malignancies in the past were excluded from the study. A written and informed consent was obtained from all willing participants on explaining the scope and methods of the study. The study group underwent a standard evaluation protocol which included history and assessment of severity of Lower Urinary Tract Symptoms (LUTS) using International Prostate Symptom Score (IPSS) questionnaire, clinical examination with digital rectal examination(DRE) for grades of prostatomegaly, and a transabdominal ultrasound of the prostate to evaluate prostate volume. The IPSS scores were categorised as mild (0-7), moderate (8-19) and severe (>20). Similarly, grades of prostate on DRE were categorised as Grade 1, 2, 3 and 4 based on Romero's grading of prostate size(6). Prostate volumes were assessed by

standard formulas on transabdominal ultrasonography for prostate. Descriptive analysis of the recorded data and Pearson correlation analysis to assess strength of linear relationship between IPSS and prostate volume – IPSS were obtained and one-way annova test was used for analysis of relationship between grades of prostatomegaly on DRE, PV and IPSS.

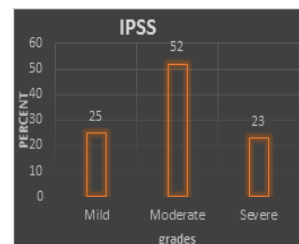
**Results:** The mean age of the study population was  $63.5 \pm 6$  years ranging from 50 to 77 yrs. (Table 1). Analysis of symptom severity distribution using IPSS in the study population revealed that more than half of the study population (52%) had IPSS suggestive of moderate LUTS (Fig 1 and Table 1). The mean IPSS of the study population was  $13 \pm 7$  with values ranging from 2-28 and mean PV was found to be  $31.5 \pm 13.15$  cc with values ranging from 12 to 77 grams. PV was found to be significantly elevated in 86% of population on TAUS with cut off value taken as 20 cc (Fig 2 and Table 1). Pearson's correlation coefficient revealed a positive correlation between PV and IPSS, though the results were not statistically significant (r score 0.0442, p-value 0.66, fig. 3). The one-way analysis of variance (ANOVA) was used to determine whether there are any statistically significant differences between means of prostatomegaly and PV, IPSS, which was found to be statistically not significant ( $p=0.301$ ).

**Table 1: Descriptive analysis of variables.**

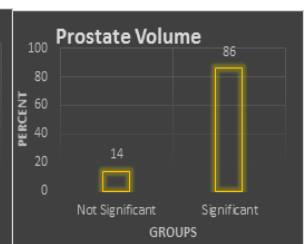
Variable	Min	Max	Mean	SD
Age (yrs)	50.00	77.00	63.5300	6.72768
IPSS	2.00	28.00	13.1300	7.07486
PV(cc)	12.10	77.00	31.572	13.15

**Table 2: One-way Annova test between grades of prostatomegaly on DRE, PV and IPSS**

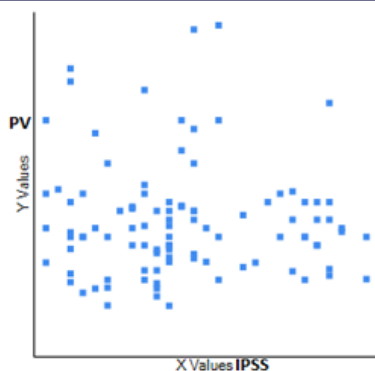
Prostatomegaly on DRE vs	IPSS	PV
f- value	1.215	0.318
P- value	0.301	0.728



**Fig 1- IPSS severity distribution**



**Fig 2 – Prostate Volume by TAUS**



**Fig 3- Correlation coefficient between PV and IPSS**

#### Discussion:

We observed a 52% incidence of moderate LUTS in the study population and a search of literature reveals similar incidence of LUTS in age matched population(8). Zhang et al reported mean volumes of  $30.83 \pm 9.64$  cc and  $35.03 \pm 17.4$  cc in age matched groups of 50-59 and 60-70 years respectively, which were concordant with our results of a mean PV of  $31.5 \pm 13.5$  cc(9).

As the volume of prostate guides the choice of therapy, it is imperative that PV should be measured accurately. The gold standard in PV measurement, Planimetric Trans rectal Ultrasound (TRUS) may not be available in every setting in developing countries. The role of alternative ways of estimation like TAUS, DRE takes precedence in such situations, albeit sub optimal results(10). Studies on PV by TAUS and its correlation with IPSS yield mixed results. TAUS, though is inexpensive and ubiquitous, is fraught with interobserver errors, distortion in assessment due to motion as well as irregular enlargement of prostate classically seen in BPH. A few authors like Bosch JL et al (11) found a low correlation between IPSS and total prostate volumes. However, In congruence to our observations and several other studies like Franciosi M(12), there was no statistical significant correlation between total prostate volume and IPSS.

DRE serves as a rapid, practical assessment of prostate size in a primary care setting. In experienced hands, it is invaluable more so in estimating malignant changes in large prostate. We observed no statistically significant correlation between grades of DRE on prostatomegaly and PV or IPSS. Roehrborn CG et al states that DRE underestimates the prostate volume, particularly when PV values are greater than 30 cc with sizes being underestimated by 25% in almost half the study population(13). The Krimpen Study further states that serum PSA does provide better assessment in prostate volumes more than 30 cc and DRE, as a clinical tool is effective only in discriminating large prostates with size > 50 cc(10). Ours is a single centre study and assessment of the study population was done by two experienced general surgeons. We excluded all patients with prostate cancer from our study group and did not resort to sub group analysis of the volumes measured by DRE vis a vis PV so as to validate any size cut off associated with prostate estimation.

#### Conclusion:

Both DRE for assessment of prostate and PV by TAUS are suboptimal methods for assessment of prostate size. Further, both estimates are suboptimal for assessment of severity of LUTS as well. It is the clinician's choice whether to believe his finger or the ultrasound probe!!!

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