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To Study Aetiology of Prostatomegaly and Correlations between Symptoms and Degree of Prostatomegaly

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Abstract: Prostatomegaly is one of the most common conditions affecting the ageing male. The effects of prostatomegaly on voiding function, however, vary greatly from patient to patient and thus make measuring its impact a challenging task. Three most common causes of prostate enlargement are benign prostatic hyperplasia (BPH), prostate cancer and Prostatitis. Prostatomegaly affects the function of urethra, urinary bladder, kidney leading to symptoms like Frequency of micturition, Nocturia, Dysuria, Hesitancy, Urgency, Lack of force and dribbling at the end, Haematuria, Retention, and symptoms of chronic renal insufficiency. Out of 166 patients enrolled in our study maximum patients were having grade III prostatomegaly. Benign Prostatic Hyperplasia was the commonest amongst all patients. Most common symptom was increased frequency of micturition in our patients. AUA score was moderate to severe in grade I prostatomegaly patients while mild to moderate in grade III prostatomegaly patients, indicating that the symptom severity do not vary with respect to grades of the prostatomegaly. DRE showed all signs of malignancy in cases of carcinoma of prostate. Age-adjusted Sr. PSA level was normal for benign disease of prostate and higher in carcinoma of prostate. Carcinoma of prostate was present mainly in grade III prostatomegaly patients.

Keywords: Prostatitis, Carcinoma Prostate, Prostatomegal.

INTRODUCTION

Prostatomegaly is one of the most common conditions affecting the ageing male. The effects of Prostatomegaly on voiding function, however, vary greatly from patient to patient and thus make measuring its impact a challenging task.

Three most common causes of prostate enlargement are benign prostatic hyperplasia (BPH), prostate cancer and Prostatitis. Prostatomegaly affects the function of the urethra, urinary bladder, kidney leading to symptoms like Frequency of micturition, Nocturia, Dysuria, Hesitancy, Urgency, Lack of force and dribbling at the end, Haematuria, Retention, and symptoms of chronic renal insufficiency.

Benign Prostatic Hyperplasia

Benign prostatic hyperplasia is a non-malignant enlargement of prostate gland. It refers to stromal and glandular epithelial hyperplasia that occurs in the periurethral transition zone of the prostate that surrounds the urethra.

The prevalence of lower urinary tract symptoms (LUTS) suggestive of BPH increases with increasing age. Moderate to severe symptoms occurs in 40 to 60% of men after the age of 60 and 80 years respectively [1].

Prostate Cancer

Prostate cancer is most common non-cutaneous cancer in men and the third most common cause of death from cancer in men of all ages. Prostate cancer is the second most frequently diagnosed cancer in men. One in three men over the age of 50 years had histologic evidence of prostate cancer, with up to 80% of these tumors being limited in size and grade and, therefore, clinically insignificant [2, 3]. The lifetime risk of prostate cancer death is only about 3%. Also, it is most common cause of death from cancer in men over the age of 75 years.

Most prostate cancer cases (about 70%) originate in the peripheral zone. The rest develop in the transitional zone (10% to 15%) and in the central zone (15% to 20%).

PROSTATITIS

The term prostatitis is defined as microscopic inflammation of the tissue of the prostate gland and is a diagnosis that spans a broad range of clinical conditions. According to the National Institutes of Health (NIH), the 4 syndromes of prostatitis are as follows: Acute bacterial prostatitis, Chronic bacterial prostatitis, chronic prostatitis and chronic pelvic pain syndrome (CPPS; further classified as inflammatory or non-inflammatory), asymptomatic inflammatory prostatitis.

Prostatitis is the third most important condition of the prostate. Recent studies suggest that the prevalence of prostatitis is 5% to 9% among men in the community. Overall, 2–10% of adult men suffer from symptoms compatible with chronic prostatitis at any time an

Correlation between Prostate size and Symptoms of Prostatomegaly

Prostatomegaly commonly manifests as lower urinary tract symptom (LUTS) consisting of irrigation (urgency, frequency, Nocturia) and obstructive symptoms (hesitancy, a weak and interrupted urinary stream, straining to initiate urination, a sensation of incomplete bladder emptying). But these symptoms do not vary with respect to grades of the prostatomegaly. Also, the objective features such as symptoms and their duration as well as objective features such as prostatic size are weakly correlated approximately 15% of men suffer from symptoms of prostatitis at some point in their lives.

Prostate Specific antigen (PSA)

PSA testing is one of the several measures that can be used for the characterization and risk assessment of prostate cancer prior to therapy, as well as for the development of treatment recommendations.

PSA is a glycoprotein produced primarily by the epithelial cells that line the acini and ducts of the prostate gland. PSA is concentrated in prostatic tissue, and serum PSA levels are normally very low. Disruption of the normal prostatic architecture, such as by prostatic disease, inflammation, or trauma, allows greater amounts of PSA to enter the general circulation. Elevated serum PSA level has become an important marker of prostate cancer.

American Urological Association (AUA) Symptom Score Index.

Recently, the measurement Committee of the American Urological Association (AUA) developed and validated an AUA Symptom Index, which has enjoyed increasing use in both clinical practice and research.

According to severity of symptoms assessed by questionnaire designed by American Urological Association, AUA score is classified into mild, moderate and severe

The score can range from 0 to 35. A symptom score of 0–7 is considered mild, 8–19 is considered moderate, and 20–35 is considered severe.

In view of these findings, this study has been undertaken in a cohort of patients with prostatomegaly in AVBRH to understand the aetiology of prostatomegaly and find out its co-relation between symptoms & degree of prostatomegaly. An attempt has also been made to study the incidence of prostate malignancy in prostatomegaly. The efficacy of prostate specific antigen in the detection of prostate cancer is also been studied.

AIM

To study aetiology of prostatomegaly and correlation between symptoms & degree of prostatomegaly.

OBJECTIVES

- To study the incidence of prostate malignancy in prostatomegaly.
- To study the efficacy of prostate specific antigen in the detection of prostate cancer.

MATERIALS AND METHODS

STUDY DESIGN

This was a prospective study. The study was carried out in department of Surgery, at JNMC and AVBRH, Sawangi (Meghe) WARDHA over the period of 2 years (May 2009 to September 2011)

STUDY METHODS

INCLUSION AND EXCLUSION CRITERIA

The following **eligibility criteria** were used for recruitment of patients in the study.

Inclusion criteria

1. Men above 40 years of age
2. Presenting with LUTS specifically attributed to prostate problems
3. Patients willing to give informed consent.

Exclusion Criteria

1. Subjects with any major medical or surgical illnesses.
2. Unwilling subjects.
3. Presenting with LUTS due to other problems

STUDY PROCEDURES

Then information regarding chief complaints including increased frequency of micturition, urgency, dribbling, straining, and incomplete emptying, hesitancy (intermittency), and nocturia were recorded. After that systemic examination of CVS, RS, per abdomen and CNS examination were carried out followed by per rectal examination and surface, size, consistency, tenderness and presence of mucus sulcus on prostate was determined. Investigations were done including complete blood counts, LFT, KFT, Sr.

Prostate specific antigen, X-ray chest, ECG, Ultrasonography abdomen and pelvis, Ultrasonography prostate(for size, surface, pre void, postvoid - residual urine) transrectal fine needle aspiration cytology and histopathology (whenever indicated) and the final diagnosis was done.

OBSERVATION AND RESULTS

Table 1: Distribution of Symptoms of Prostatomegaly.

Symptoms	Total	
	Present	%
Increased frequency of micturition	114	68.67
Incomplete emptying	78	46.98
Hesitancy (intermittency)	106	63.85
Urgency	86	51.80
Dribbling (weak Stream)	97	58.43
Straining	70	42.16
Nocturia	71	42.77

Table 2: Distribution of Increased Frequency of micturition as per the size on USG examination

Size as per USG examination	Increased Frequency of micturition				Grand total	P value
	Present	%	Absent	%		
I	29	82.85	6	17.15	35	12.13 P=0.002 S
II	32	72.72	12	27.28	44	
III	53	60.91	34	39.09	87	
Grand Total	114	68.07	53	31.93	166	

Table 3: Distribution of Incomplete Emptying as per the size on USG examination

Size as per USG examination	Incomplete emptying				Grand total	P value
	Present	%	Absent	%		
I	23	65.71	12	34.29	35	15.44 P=0.0004 S
II	18	40.90	26	59.1	44	
III	37	42.52	50	57.48	87	
Grand Total	75	45.18	88	54.82	166	

Table 4: Distribution of Hesitancy (intermittency) as per the Size on USG examination

Size as per rectal examination	Hesitancy (intermittency)				Grand total	P value
	Present	%	Absent	%		
I	27	77.14	8	22.85	35	7.48 P=0.02 S
II	29	65.90	32	34.1	44	
III	51	58.62	36	41.38	87	
Grand Total	107	64.45	59	35.55	166	

Table 5: Distribution of Urgency as per the Size on USG examination

Size as per rectal examination	Urgency				Grand total	P value
	Present	%	Absent	%		

I	23	65.71	12	34.29	35	9.11 P=0.01 S
II	25	56.81	19	43.19	44	
III	39	44.82	48	55.18	87	
Grand Total	87	52.40	79	47.6	166	

Table 6: Distribution of Dribbling (weak Stream) as per the Size on USG examination

Size as per rectal examination	dribbling(weak Stream)				Grand total	P value
	Present	%	Absent	%		
I	29	82.85	6	17.15	35	31.46 P<0.0001 S
II	26	59.09	18	40.91	44	
III	39	44.82	48	55.18	87	
Grand Total	94	56.62	72	43.38	166	

Table 7: Distribution of Straining as per the size on per USG Examination

Size as per rectal Examination	Straining				Grand total	P value
	Present	%	Absent	%		
I	22	62.85	11	37.15	35	19.14 P<0.0001 S
II	20	54.54	24	45.46	44	
III	29	33.33	58	66.67	87	
Grand Total	71	42.77	95	57.23	166	

Table 8: Distribution of Nocturia as per the size on USG Examination

Size as per rectal Examination	Nocturia				Grand total	P value
	Present	%	Absent	%		
I	24	68.57	11	31.43	35	20.59 P<0.0001 S
II	16	36.36	28	63.64	44	
III	32	36.78	55	63.22	87	
Grand Total	72	43.37	95	56.63	166	

Table 9: Distribution of Patients as per the Grading on USG Finding.

Grade as per USG findings	**Total**	
	Present	**%**
I	35	21.08
II	44	26.51
III	87	52.41
Grand Total	166	100.00

Table: 10. Distribution according to Diagnosis

Diagnosis	No. of Patients	%
BPH	91	54.81
Carcinoma	4	2.41
Prostatitis	29	12.04

Table 11: Distribution of patients as per the Histopathology report

Histopathology report	Total	
	Present	**%**
Adenocarcinoma	4	2.41
BPH	91	54.81
Not operated	71	42.78
Grand Total	166	100.00

Table 12: Distribution of Diagnosis in Operated Patients

Diagnosis	No. of Patients	%
BPH	91	95.78
Carcinoma	4	4.21
Total	95	100

Table 13: Distribution of Patients as per the Histopathology Report

Histopathology report	Total	
	Present	**%**
Adenocarcinoma	4	2.41
BPH	91	54.81
Not operated	71	42.78
Grand Total	166	100.00

DISCUSSION

In our study**,** 166 patients of prostatomegaly were enrolled. Of these, 87 (52.41%) patients had grade III prostatomegaly. 44(26.1%) had Grade II and 35(21.08%) had to grade I prostatomegaly.

Aetiology-

The incidence of this aetiology in comparison with other studies is given in the following table and the findings of our study are in the line with published literature.

Diagnosis	***Mittal BV et al*** [6]	***Moon et al***	***Herranz et al*** *[66]*	Our study (Out of 166 patients)	Our study (in operated patients i.e. 95)
BPH	92.97%	-	-	54.81%	95.78%
Carcinoma of Prostate	7.02%	-	6%	2.41%	4.21%
Prostatitis	58%	up to 25%	-	12.04	-

BPH was the commonest aetiology in our study, followed by prostatitis and then carcinoma of the prostate which is in line with results of studies by **Mittal BV et al, Moon**, ***Herranz et al.***

Symptoms

Symptoms	**Total**	
	Jukka T. Häkkinen [67]	**Our Study**
Increased frequency of micturition	34.9	68.67
Incomplete emptying	43.3	46.98

Hesitancy (intermittency)	46.9	63.85
Urgency	68.0	51.80
Dribbling (weak Stream)	60.0	58.43
Straining	46.4	42.16
Nocturia	57.3	42.77

In our study, most common symptoms were increased frequency of micturition (68.67%) followed by hesitancy (intermittency) of urination (63.85), dribbling (weak Stream) urine (58.43%). ***Eckhardt et al*** studied the *Prevalence and bothersomeness of lower urinary tract symptoms in 475 men and* established that weak urinary stream, frequency, and urgency appear to be the most common symptoms [4]

Age group and symptoms

Age group	***Verhamme KM et al*** [65]	Our Study
40-49 years	3 cases per 1000 man-years at the age of 45-49 years	9 (5.42%)
50-59 years	-	24 (14.45%)
60-69 years	-	59 (35.24%)
70 years and above	38 cases per 1000 man-years at the age of 75-79 years	74 (44.57%)

In our study no. of patients increased from 5.42% in the age group of 40yrs-49yrs to 44.57% in the age group of 70 yrs and above which shows the incidence of symptoms increases linearly with age. This result is in line with published literature by ***Verhamme KM et al*** [5] and ***G.M. Clifford et al*** [6], ***Sciarra A et al*** 7].

Briganti A et al have reported that larger prostate volume may be protective against prostate carcinoma in a study of Prostate volume and adverse prostate cancer features in 3412 patients [8].

Age group and symptoms

In our study no. of patients increased from 5.42% in the age group of 40yrs-49yrs to 44.57% in the age group of 70 yrs and above which shows the incidence of symptoms increases linearly with age. This result is in line with published literature by ***Verhamme KM et al*** [5] and ***G.M. Clifford et al*** [6], ***Sciarra A et al*** [7].

In our study mild AUA score was present commonly in the age group of 70rs and above and severe AUA score was present commonly in 50yrs-59yes age group while moderate AUA score was more common in 40yrs-49yrs age group. The Same conclusion was drawn by ***Sciarra A et al*** [7] in 543 patients regarding the Relationship among symptom score, prostate volume, and urinary flow rates, symptom score continued to be weakly correlated with age and prostate volume.

But in our study, 4 patients with prostatomegaly diagnosed to have malignancy giving an overall incidence of 2.41 %. Of these 4 cases, 2 cases were seen in patients having grade II prostatomegaly and 2 cases were having Grade III prostatomegaly.

As studied by ***Mohammed El Imam M et al*** in 194 patients as screening for carcinoma prostate, elevated PSA and DRE pointed to the diagnosis of prostate cancer in 100% and 88.9% respectively [9].

Comparison of our study with this study is given in the following table.

	Mohammed El Imam M et al study	Our study
Digital rectal examination	88.9%	100%
Sr. PSA	100%	100%

In a study by ***Oesterling JE et al*** in 2119 patients they defined age-adjusted reference ranges for Sr. PSA [9].

Following table shows a comparison of our Study.

Age group	PSA Normal Range [***Oesterling JE et al***]	Mean PSA Level[our study]
40-49 years	0-2.5	1.65±0.41
50-59 years	0-3.5	3.55±3.79
60-69 years	0-4.5	3.69±8.45
70 years and above	0-6.5	5.53±5.57

	Wu T.T. study **[71]**	*Our study*
Sensitivity	*96%*	*100%*
Specificity	*14%*	*97.59%*

In a study of Prostate-Specific Antigen Levels as a Predictor of Lethal Prostate Cancer. In 267 men by ***Katja Fall et al,*** they analyzed that baseline PSA value and rate of PSA change are prognostic factors for lethal prostate cancer [11].

In a population-based study researchers agree that the introduction of PSA testing led to a dramatic increase in the number of men diagnosed with prostate cancer, with peaks in 1991 for men over age 65 and in 2002 for men under age 65 [12] ***Draisma et al*** published a model based on data from the ERSPC which enrolled 42,376 men suggesting that prostate cancer diagnosis was advanced by as much as 10 years among men aged 55, and by five years for men aged 75 [13].

In our study, mean PSA levels were 4.35 (ng/ml). Whereas in the patient diagnosed to have a prostatic carcinoma, the mean PSA levels were > 20 (ng/ml). The sensitivity of PSA in our study using the traditional cut-off (4.0 ng/ml) was 100% and specificity was 97.59 %. This finding suggests that the PSA has a definite role in the diagnosis of cancer. As in Western countries, PSA testing proved to be suitable for clinical use in an Indian setting. As our study was cross-sectional, we could not determine the use of PSA testing for the early detection of prostate cancer.

Correlation between symptoms & degree of prostatomegaly

Barry MJ et al analyzed in their study of Relationship of symptoms of prostatism to commonly used physiological and anatomical measures of the severity of benign prostatic hyperplasia [14]**.**

In 198 patients that symptom severity was not correlated with uroflowmetry, post-void residual, prostate size and degree of bladder trabeculation.

In a study by ***Birkhoff JO et al*** in 26 patients they concluded that the subjective features such as symptoms and their duration as well as objective features such as prostatic size are not good predictors of the eventual development of urinary retention [15].

In our study, we found that grade I prostatomegaly patient had severe AUA score more commonly and grade III prostatomegaly patients had mild aura score more commonly

When the occurrence of symptoms was compared across the different grades of the prostatomegaly, we found no significant difference for any of the symptoms, indicating that the symptoms do not vary with respect to grades of the prostatomegaly. This finding further ruled out the possibility that the higher grade of prostatomegaly patients presents with increased frequency of symptoms. Our finding is as per the reported literature on clinical profile of prostatomegaly patients.

SUMMARY

- Out of 166 patients enrolled in our study maximum patients were having grade III prostatomegaly
- Benign Prostatic Hyperplasia was the commonest amongst all patients.
- Commonest symptoms was increased frequency of micturition in our patients
- DRE showed all signs of malignancy in cases of carcinoma of prostate
- The age-adjusted Sr.PSA level was normal for benign disease of prostate and higher in carcinoma of the prostate.

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