



EFFECT OF BODY MASS INDEX ON PROSTATE.

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ABSTRACT **BACKGROUND:** People with obesity develop metabolic syndrome (MetS) and so are at risk of suffering from other diseases like diabetes mellitus, hypertension benign prostatic hyperplasia (BPH) etc. The present study is aimed to examine the association between BPH, obesity, and age among men of the Southern Coastal Odisha.

MATERIALS AND METHODS: this retrospective study comprises of 154 cases of which 60 cases without any urinary symptoms were taken as controls in contrast to 94 cases showing urinary symptoms. the age and body mass index were recorded for each patient. All the cases were subjected to Ultrasound to find out the transverse and antero-posterior diameter of prostate.

RESULT: it is found that with increasing age the size of prostate increases for symptomatic uropathies. It is greatest in case of obstructive group. Body mass index is significantly high in both irritative and obstructive groups.

CONCLUSION: The BMI along with age has profound role in developing symptomatic prostate

KEYWORDS : prostate, BPH, body mass index, Tr diameter, A-P diameter.

I. INTRODUCTION

People with obesity are at risk of suffering from other metabolic disorders like diabetes mellitus, hypertension benign prostatic hyperplasia (BPH) etc. The present study aimed to examine the association between BPH, obesity, and age among men of the Southern Coastal Odisha.

BPH is a common condition among elderly males. It has been reported in 50% of all males by the 6th decade and over 90 % males above 70 years; Garaway, W(1994)¹, thus a common cause of morbidity among older men. The commonest age group of presentation for both carcinoma and BPH is seventh decade and obstructive urinary symptoms are its most common mode of presentation; Chandanwal S(2013)².

Li-Ping Xie(2007)³ observed in Chinese population that obese men were at increased risk of an enlarged prostate compared to with non obese men. Studies by different authors have showed that obesity increases the risk of BPH.^{4,5,6,7}

Patients with a large BMI tended to have a larger Prostatic volume, and higher IPSS. Jong M. K. (2011)⁸ hypothesized that weight loss could help in the relief of LUTS (lower urinary tract syndrome) in BPH patients. Lee S. H. (2009)⁹ observed that Prostate volume was positively correlated with urgency and nocturia in men with central obesity. Zhuo Yin(2015)¹⁰ suggests from his study that MetS is associated with higher prostatic volume, prostate symptom score and voiding symptoms. A recent meta-analysis has showed that obesity, dyslipidemia, and older age were determinants of BPH. Gacci M,(2015)¹¹.

II. AIM AND OBJECTIVES

To examine the association between BPH, obesity, and age among men of the Southern Coastal Odisha.

III. MATERIALS AND METHODS

The present study was carried out in the department of anatomy, MKCG Medical College, Berhampur. Total 154 cases were selected from population of Southern Coastal Odisha. 60 number of controls were selected in contrast to 47 cases of obstructive uropathy and 47 cases of irritative uropathy. Their height, weight, family size, diet, economic status, educational status, addiction and habituation, culture and associated diseases were thoroughly assessed and kept in document to study them as disease modifying factors.

The patients were categorised into two groups:

a. Patients with urinary symptoms: Those seeking medical advice for lower urinary symptoms.

b. Controls: Those seeking medical advice for other physical ailments.

Group 'a' were further divided into two groups:

I. Obstructive lower urinary symptoms: who came with urinary retention or with indwelling catheters.

II. Irritative lower urinary symptoms who showed **pre-voiding symptoms** like precipitancy, unable to control urination, frequency, nocturia; **voiding symptoms** like hesitancy, poor stream, delayed bladder evacuation and strangury or **Post voiding symptoms** like dribbling, incomplete evacuation and intermittency.

Patients with temporary urinary infections were temporarily excluded till their recovery.

All the patients with urinary symptoms and controls were subjected through either Abdominal Contact Scanning(PAUS) or Transrectal Ultrasound(TRUS) to find out the prostate diameters.

The study was approved by the institutional ethical committee.

Parameters: age, body mass index and transverse and anteroposterior diameters of prostate were applied to the study.

Statistics: All the calculations and data processings were done by discriminant analysis method and passed LSD test.

IV. OBSERVATION

Table-I: Age distribution

group	No.	Max.	Min.	mean	Sd	sE	LSD test		
							group	t value	p
Control	60	68	15	34.85	10.65	1.37	CTRL vs OBS	14.30	<0.001
Obstrctv	47	77	45	63.38	7.84	1.14	CTRL vs IRT	12.18	<0.001
irritative	47	86	30	59.15	11.73	1.71	OBS vs IRT	2	<0.05

Graph: normal growth curve of prostate with age.

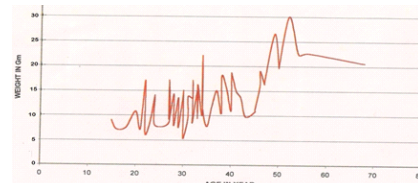


Table II Body mass index(Kg/m²)

group	No.	Max.	Min.	mean	Sd	sE	LSD test		
							group	t value	p
Control	60	36.36	16.2	22.26	4.19	0.54	CTL vs OBS	2.59	<0.01
Obstrctv	47	32.81	17.47	24.20	3.64	0.53	OBS vs IRT	2.18	<0.001
irritative	47	32.89	14.53	25.94	3.6	0.53	CTL vs IRT	4.90	<0.01

Table III: diameters of prostate in cm.

diameters	group	max	min	mean	sd	Se	LSD test		
							group	t value	P
Tr.	Control	4.5	2.2	3.27	0.64	0.08	CTL vs OBS	8.46	<0.001
	Obstructive	8.2	3.0	5.42	1.23	0.18	CTL vs IRT	6.32	<0.001
	irritative	6.0	2.7	4.06	0.83	0.12	OBS vs IRT	7.68	<0.001
A-P	Control	4.0	1.7	2.64	0.55	0.07	CTL vs OBS	8.36	<0.001
	Obstructive	7.2	2.8	4.89	1.12	0.16	CTL vs IRT	6.32	<0.001
	irritative	5.8	1.0	3.90	0.93	0.14	OBS vs IRT	4.68	<0.001

IV. DISCUSSION

Table I: In control group with increasing age, the volume of prostate increases and then decreases with increasing age (graph). But while taking the volume of obstructive and irritative groups, there is a definite growth spurt of prostate in 63.38 ± 7.84 yrs and 59.15 ± 11.73yrs respectively. LSD test confirms its significance. This finding is corroborative with the studies of Swyer(1944)¹², that the growth of prostate maintains a plateau from 35 to 45 years, thereafter it either progresses towards BPH with a sudden rise in its volume or regresses progressively towards atrophy. Garraway and Collin (1991)¹³ have also shown that age has a higher specific rate for BPH development. Shi-Jun Zhang et al (2013)¹⁴ found the mean length increased after age 60. Mor A et al (2018)¹⁵ found the youngest patient to develop prostatic hypertrophy was 50 years and the oldest being 80 years with a mean age 64.46. The mean age of the patients was 65.19±9.13 years and their mean BMI was 23.7±4.4 kg/m². jong kim⁸.

Table II: It is seen from the table LSD test, that BMI might be playing a significant role between the control and irritative group having t=4.90**, and comparably less in control vs obstructive group, t= 2.59**, least in obstructive vs irritative group, t= 2.18*.

Glynn and campion(1985)¹⁶. Sidney(1991)¹⁷ reported that a low body mass index is associated with the clinical diagnosis of BPH, with an elevated risk of prostatictomy. But Daniel(1993)¹⁸ countered that obesity is associated with prostatic enlargement but not with obstruction.

Whereas Bosch and Hop(1994)¹⁹ opine in their study, a weak correlation between the total prostate volume and body mass index and between the volume of the central prostate and body mass index. The variation in prostate volume is determined by the variation in body mass index by only 2%. Therefore body mass index is hardly associated with prostatic volume. Masumori et al(1997)²⁰ shows that men with larger body mass could potentially have a larger prostate without evidence of BPH

Bmi: watnabe(1974)²¹, had observed pathogenesis of prostatic hypertrophy derived neither from the size nor from weight, but from the deformity of the prostate due to change in its diameter. There are weak statistical correlation between prostatic volume and BMI. Garraway(1991)¹³.

Waist circumference (central obesity) was positively correlated with prostate volume (P = 0.034). Men with waist circumference > 90 cm experienced a 1.36-fold increased risk of severe LUTSs (95% CI 0.82–2.41) compared with men with waist circumference ≤ 90 cm Lee S.W.(2009)²².

BMI of 28 kg/m² or more) men experienced a significantly increased age-adjusted risk of BPE compared with men with a lower BMI. Each 0.37-kg/m² increase in the BMI was associated with a 1-cm³ increase in prostate volume. Li-Ping Xie(2007)³, jong kim (2011)⁸ found Positive correlations between BMI and PV and IPSS. The mean age of the patients was 65.19±9.13 years and their mean BMI was 23.7±4.4 kg/m².

Table III: The study shows that all the diameters in controls (Tr- 3.27 ±0.08 and AP-2.64±0.07)cm are less in comparison to symptomatic groups. The diameters in obstructive are Tr-5.42± 0.18cm and AP-4.89±0.16cm. In irritative group the values are Tr- 4.06±0.12cm and

AP- 3.92±0.14cm. All the dimensions are greatest in obstructive group. These findings coincide with the studies of Watanabe(1974)²¹ and Kaye(1990)²³.

IV. RESULT

It is found that with increasing age, the diameters of prostate increases for symptomatic uropathies. It is greatest in case of obstructive group. But in case of controls the size of normal prostate declines with increasing age. So the prostate of a person which usually changes in shape during 4th to 6th decade are subjected to some unknown sensitive factors. Body mass index is significantly high in both irritative and obstructive groups.

V. CONCLUSION

BMI has a definite initiative power in developing symptoms, combinly with increasing age it has a significant impact on the size of prostate and so in the development of obstructive symptoms.

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