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ORIGINAL RESEARCH

Assessment of correlation of various prostate pathologies with serum prostate specific antigen

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ABSTRACT

Background: There are various prostate pathologies. Among all, Benign Prostatic Hyperplasia (BPH) is a common health issue among ageing men globally. The present study was conducted to assess correlation of various prostate pathologies with serum prostate specific antigen.

Materials & Methods: 58 male patients with various prostate pathologies presenting with LUTS underwent DRE and were worked up with USG KUBP, Serum PSA and biopsy. A trans-abdominal ultrasound examination was done to assess the size of the prostate gland. Patients with suspicious DRE finding or increased Serum PSA levels (defined as more than 4 ng/ml) underwent prostate biopsy

Results: Age group 50-60 years had PSA level 3.5 ng/ml, 61-70 years had 15.4 ng/ml and 71-80 years had 11.9 ng/ml. The difference was significant (P< 0.05). IPSS was mild in 29, moderate in 23 and severe in 6 patients. PSA (ng/ml) level in mild patients was 4.7, in moderate was 6.2 and in severe was 13.7. PSA (ng/ml) level in prostate grade I patients was 4.16, in grade II was 12.3 and in grade III was 31.5 and in grade IV was 42.6. The difference was significant (P< 0.05).

Conclusion: The mean serum PSA levels rises with increasing age. Serum PSA levels has a significant correlation with international prostate symptom severity scoring wherein mean serum PSA level rises with severity of LUTS. Prostate-specific antigen is specific for prostatic tissue and is raised in both benign and malignant lesions of prostate.

Key words: Benign Prostatic Hyperplasia, Prostate specific antigen, Men

INTRODUCTION

There are various prostate pathologies. Among all, Benign Prostatic Hyperplasia (BPH) is a common health issue among ageing men globally. It is evident that BPH is a progressive disease that significantly affects the quality of life nearly one third of men older than 50 years.[1] BPH is histologically obvious in up to 90% of men by age 85 years and over 30 million men have symptoms related to BPH worldwide. However, very little is known about the natural history of BPH and dynamics of Prostate-Specific Antigen.[2]

Among the carcinomas, the majority are adenocarcinomas that develop from the acini of the ducts. Other rare histological subtypes include small cell carcinomas, signet ring carcinoma, adenoid cystic carcinoma, neuroendocrine tumor, transitional cell carcinoma, which account for about 5%.[3] Digital rectal examination (DRE) and transrectal ultrasonography are a preliminary practical diagnostic method but has low specificity and sensitivity. A transrectal biopsy is essential to confirm the diagnosis. Most popular is Gleason's microscopic grading system development of Donald F Gleason in 1966.[4] Gleason's grading system is superior and the best predictor of disease progression and outcome. Serum prostate-specific antigen (PSA), a marker for prostatic carcinoma has high sensitivity, specificity, and compliments histopathological diagnosis. Gleason's microscopic grading is a paramount feature and with PSA are important for diagnosis, management, and prognosis of carcinoma.[5] The present study was conducted to assess correlation of various prostate pathology with serum prostate specific antigen.

MATERIALS & METHODS

This study consisted of 58 males patients with various prostate pathologies. All were ready to actively participate in the study after giving their written consent.

Data such as name, age etc. was recorded. All patients presenting with LUTS underwent DRE and were worked up with USG KUBP, Serum PSA and biopsy. DRE was carried out with the patient lying in left lateral position. A trans-abdominal ultrasound examination was done to assess the size of the prostate gland. Patients with suspicious DRE finding or increased Serum PSA levels (defined as more than 4 ng/ml) underwent prostate biopsy.

RESULTS

Table I Age group and PSA values

Age group (years)	PSA (ng/ml)	P value
50-60	3.5	0.01
61-70	15.4	
71-80	11.9	

Table I shows that age group 50-60 years had PSA level 3.5 ng/ml, 61-70 years had 15.4 ng/ml and 71-80 years had 11.9 ng/ml. The difference was significant (P< 0.05).

Table II Assessment of parameters

Parameters	Variables	Number	P value
IPSS	Mild	29	0.05
	Moderate	23	
	Severe	6	
PSA (ng/ml)	Mild	4.7	0.02
	Moderate	6.2	
	Severe	13.7	
PSA (ng/ml)	Prostate grade I	4.16	0.01
	Grade II	12.3	
	Grade III	31.5	
	Grade IV	42.6	

Table II shows that IPSS was mild in 29, moderate in 23 and severe in 6 patients. PSA (ng/ml) level in mild patients was 4.7, in moderate was 6.2 and in severe was 13.7. PSA (ng/ml) level in prostate grade I patients was 4.16, in grade II was 12.3 and in grade III was 31.5 and in grade IV was 42.6. The difference was significant (P< 0.05).

Table III Correlation of PSA level and prostatic lesions

PSA (ng/ml)	BPH	Prostatitis	HGPIN	LGPIN	Adenocarcinoma	P value
0-7	15	9	3	1	0	0.03
7-14	6	2	2	1	0	0.01
14-21	4	3	0	1	0	0.02
21-28	2	0	0	1	0	1
28-35	1	0	0	0	0	1
>35	0	0	3	0	4	0.12
Total	28	14	8	4	4	

Table III shows that PSA 0-7 ng/ml had 15 cases of BPH, 9 cases of prostatitis, 3 cases of HGPIN, 1 case of LGPIN. 7-14 ng/ml had 6, 2, 2 and 1, 14-21 ng/ml had 4, 3,0,1 and 0, 21-28 ng/ml had 2, 0,0,1,0, 28-35 had 1,0,0,0,0 and >35 ng/ml had 0,0,3,0 and 4 cases respectively. The difference was significant (P< 0.05).

DISCUSSION

Prostate is fibromusculo-glandular organ encircling the neck of the urinary bladder. So, enlargement of prostate either due to nodular hyperplasia, prostatic intraepithelial neoplasia or adenocarcinoma may give rise to bladder outlet obstruction. The incidence of prostatic lesions increases with increasing age.[6] In the aging male, there is significant tissue remodeling taking place within the prostate.[7] It was postulated that the growth is the result of a disturbed balance between apoptotic and proliferative activities with net reduction in apoptotic activity. Histologic analysis showed a decreased apoptotic activity in glandular and basal epithelial cells of the prostate.[8]

The high sensitivity and low specificity of PSA testing in the diagnosis of prostate cancer is a problem in clinical practice.[9] Use of PSA testing alone has reduced specificity owing to the influence of prostate volume and other factors such as infection and manipulation.[10] The present study was conducted to assess correlation of various prostate pathology with serum prostate specific antigen.

We found that age group 50-60 years had PSA level 3.5 ng/ml, 61-70 years had 15.4 ng/ml and 71-80 years had 11.9 ng/ml. Hirachand et al[11]assessed the correlation between serum prostate specific antigen level and histological findings in biopsy specimens of men with prostatic disease. Benign prostatic hyperplasia was the most common histological lesion encountered (n=95; 74.22%). Prostatic adenocarcinomas were seen a decade older than those with benign lesions. Maximum number of the benign cases had the Prostate specific antigen range of 0-7ng/ml. Most of the prostatic intraepithelial neoplasia lesions were seen within the PSA range of 0-7ng/ml and adenocarcinoma in the range of >20 ng/ml.

We found that IPSS was mild in 29, moderate in 23 and severe in 6 patients. PSA (ng/ml) level in mild patients was 4.7, in moderate was 6.2 and in severe was 13.7. PSA (ng/ml) level in prostate grade I patients was 4.16, in grade II was 12.3 and in grade III was 31.5 and in grade IV was 42.6. Kumar et al[12] conducted a clinicopathological study of 100 prostatic biopsies. A total of 100 patients were included in the study. The mean age in our study was 62.5 years [range 50-90 years]. The majority of the patients in the study group were in the age group of 61-70 years. PSA levels of the patients were compared according to their age. The mean serum PSA for age group 50-60 years was 3.9 ng/ml, for age group 61-70 was 15.2 ng/ml, for age group 71-80 was 11.3ng/ml, for age group 81-90 was 11.4 ng/ml. The mean serum PSA for the whole group was 13.2 ng/ml. The mean serum PSA level was found to increase with each decade, starting from 50 years up to 90 years.

We found that PSA 0-7 ng/ml had 15 cases of BPH, 9 cases of prostatitis, 3 cases of HGPIN, 1 case of LGPIN. 7-14 ng/ml had 6, 2, 2 and 1, 14-21 ng/ml had 4, 3,0,1 and 0, 21-28 ng/ml had 2, 0,0,1,0, 28-35 had 1,0,0,0,0 and >35 ng/ml had 0,0,3,0 and 4 cases respectively.

Balagobi et al[13] assessed the relationship between serums prostate specific antigen (PSA), prostate volume (PV), and PSA density (PSAD) and to evaluate variations of above parameters with aging and to assess the mean prostate volume. This study recruited a total number of 562 men, clustered into 5 age groups and their mean prostate volume (PV) was 42.9. The median PSA was 2.5ng/dl with an inter quartile range of 0.37. The mean PSA density (PSA/PV) was 0.11. The tendency towards increase in PSA and prostate volume with increasing age showed statistical significance.

CONCLUSION

Authors found that mean serum PSA levels rises with increasing age. Serum PSA levels has a significant correlation with international prostate symptom severity scoring wherein mean serum PSA level rises with severity of LUTS. Prostate-specific antigen is specific for prostatic tissue and is raised in both benign and malignant lesions of prostate.

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