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Immuno-Pathological Profile Of Lesions On Prostate And Prostate Specific Antigen(Psa) Levels Of Prostatic Cancer

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Abstract

Background: Benign prostatic hyperplasia and adenocarcinoma are common diseases that account for considerable morbidity and mortality of ageing population. In cancer related deaths in men, the prostatic cancer is the second most common to lung cancer. To assess the morphological spectrum of lesions of prostate and serum PSA levels.

Materials And Methods: The Retrospective study included a total of 62 samples of different prostatic lesions ,in the age range of 42 to 78 years, over a period of 1 year from May 2015 to July 2016. All the lesions were graded into non-neoplastic and neoplastic lesions. The histological data and serum PSA levels obtained were analyzed and compared with other similar studies.

Results : Non neoplastic lesions were common in this study with Nodular hyperplasia(89%) with 52% associated with prostatitis. Among the neoplastic lesions adenocarcinoma occurred in 6% and urothelial carcinoma in 4.8%. Adenocarcinoma and PSA shows good correlation with final diagnosis(p value<0.05).

Conclusion: Serum PSA was a good tool for screening carcinoma prostate; however biopsy is essential for diagnosis. More studies are required in relation to benign mimickers.

Keywords: Benign prostatic hyperplasia, Benign mimickers, Adenocarcinoma prostate, PSA, Prostate cancer

Introduction

Benign prostatic hyperplasia and adenocarcinoma are common diseases that account for considerable morbidity

and mortality of ageing population.Benign prostatic hyperplasia is extremely common disorder in men over age 50. The prevalence of this disease is believed to be highly significant in most communities. In cancer related deaths in men, the prostatic cancer is the second most common to lung cancer [1].“When hair becomes gray and scanty, when specks of earthy matter begin to be deposited in tunics o f artery, and when a white zone is formed at the margin of the cornea, at this same period the prostate gland usually, might perhaps say in variably becomes increased in size.”[2]The prostate gland is the largest accessory reproductive organ in male. It is an exocrine gland and forms a significant component of seminal fluid. Benign prostatic hyperplasia (BPH) is a common urological condition in men. The prevalence of BPH increases from 20% at 40 years of age to 90% by the eighth decade of life [3]. Prostate cancer is an important growing health problem, presenting a challenge to urologists, radiologists and pathologist [4].Prostate cancer (PCa) is the second most common cause of cancer in men after lung cancer and the sixth leading cause of cancer death among men worldwide[5]. In India, it constitutes about 5% of all male cancers according to consolidated report of population based cancer registries under ICMR in the year 2012 [5].Previously it was thought, that prevalence of prostate cancer in India is far lower as compared to the western countries but with the increased migration of rural population to the urban areas, changing life styles, increased awareness, and easy access to medical facility, more cases of prostate cancer are being diagnosed with the realization that we are not very far behind as compared to western population[6].Prostate is the second leading site of cancer in four population Based Cancer Registries [PBCRs] namely Delhi, Kolkata, Nagpur and Thiruvananthapuram, Third leading site of cancer in cities like Bangalore and Mumbai[7]. It is among the top ten leading sites of cancers in the rest of the PBRCs of India. Prostate-specific antigen (PSA), digital rectal examination, and trans rectal ultrasound are the tools most commonly used to screen for prostate cancer[8]. Many investigators have studied various histo morphological features and tried to assess their usefulness in diagnosing or excluding prostatic adenocarcinoma. The aim of the study was to correlate the morphological lesions of prostate and serum PSA levels in different prostatic cancer.

Materials And Methods

The Retrospective study was conducted at Department of Pathology, Shanthigiri siddha medical college over a period of 1 year ; from May 2015 to July 2016. All prostatic biopsies, transurethral resection of prostate [TURP] chips and prostatectomy specimen received in the Ravi Pathology and Microbiology laboratory, Trivandrum, for histopathological evaluation along with serum PSA levels were included in this study.

The clinical and relevant investigative details required for the study were obtained from their medical records and recorded in the Proforma. The PSA levels were estimated using the ACCULITE Semi-Automated chemiluminescenceimmune assay (CLIA) which estimates PSA by a sandwich assay utilizing a constant amount of 2 antibodies-Enzyme labeled antibody and biotin labeled monoclonal mouse IgG antibody in buffer.[9]

The specimens obtained were fixed in 10% formalin after detailed and careful examination. The entire tissue was processed in case of needle biopsy and TURP. In cases of prostatectomy representative bits were processed. Then sections 4 to 5 microns thick were preparedfrom original paraffin blocks. These were stained routinely with Haematoxylin and Eosin.H&E stained slides were examined thoroughly and diagnosis of each case was made.[10]

All the lesions were graded into non-neoplastic and neoplastic lesions. The cases of prostatic adenocarcinoma were graded using Gleason microscopic grading.The histological features were correlated with clinical profile and PSA levels.

Results and Discussion

A total of 62 prostatic specimens obtained from patients were included in the study. The patients in the study included only males in the age range of 42 to 78 years. 75% of cases were in the age range of 66-75 yrs [mean age - 70.5 yrs]. A significant increasing trend in the proportion of older patients [above 55 yrs] was observed in all the lesions. Of the total 62 prostate specimen 55 cases were benign[89%] and 7 cases were malignant[11.%]. Of the benign prostatic tumour 55(89%) were Nodular hyperplasia ,4(6%) (Fig. 1) prostatic adenocarcinoma and 3(4.8%) (Fig. 2) were urothelial carcinoma of prostatic urethra.

Majority of the BPH cases(89%) had PSA 0-4 while majority of the malignant cases(11%) had PSA >10. 12% of malignant cases had PSA 4 to 10.About 25% cases of BPH had PSA >10{Table :1}.When PSA was 4-10 there were a total of 62 cases out of which 55 cases were BPH and 4 cases were adenocarcinoma and 3 cases were urothelial carcinoma. Moderate[9.7%] and severe prostatitis[17.7%] (Fig. 3) showed maximum elevated PSA>10.Mild prostatitis cases had PSA level maximum in the range 4 to 10[23.4%] {Table :2} .

The results of our study are in accordance with those in other parts of India where benign lesions range from 79.9% (Martin RM et al [Punjab])[11] to 92.5% as well as with other studies from Asian and African countries[12]. The prevalence rate of 11% of neoplastic lesions observed in present study is comparable with study by Sirish S et al [Maharashtra]. [13]

Benign lesions with PSA0-4ng/ml range from 2%(Sirish S et al)to 71.6%(Kshitij et al)[14].Our study showing 46.6% corresponds to this range. Benign lesions with PSA 4-10ng/ml range from 22.6%(Kshitij et al) to 49% (Sirish S et al)[15].Our finding 28.5%is also in accordance with this.Benign lesions with PSA>10ng/ml range from 3% to 19%[16].However in the present study significant elevation of PSA (>10) is shown by 25.2%.This is because these cases of NH were associated with acute and chronic prostatitis [41.9% 0f prostatitis had PSA>10,granulomatous prostatitis(5.5%),infarct and Acute urinary retention][17]. All these elevates the PSA values.The most common neoplastic lesion of prostate is acinar adenocarcinoma ranging from 7.02% (Mittal et al) to 20.05%(Monika Garg et al)[18-19].Adenocarcinoma incidence of 14.4% is in accordance to above studies. Second most common lesion is Urothelial carcinoma metastatic from bladder ranging from 0.6 %(B.Reddy et al) to 2.1% (K.Subathra et al).Our finding of 1.7% is in accordance with above findings[20-23].

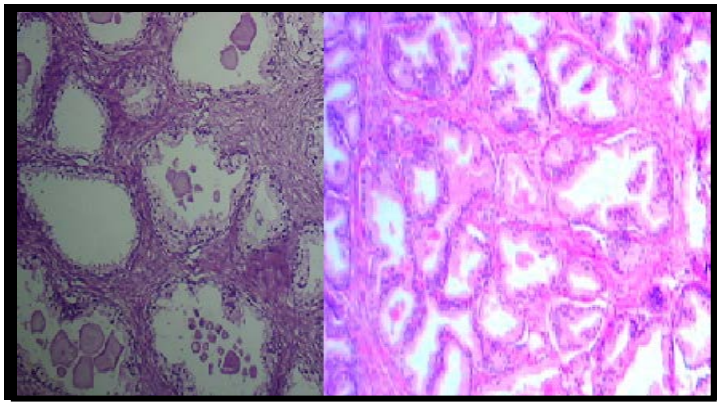

Fig 1: Nodular hyperplasia showing hyperplastic glandular and stromal components.Intra luminal corpora amylacea seen (H & E, 100X).

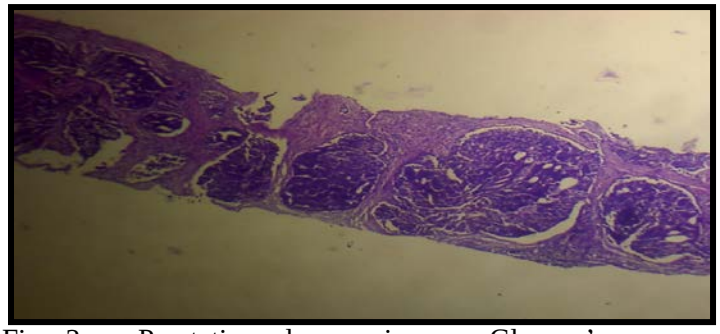

Fig 2 : Prostatic adenocarcinoma, Gleason's score 4+5=9/10, Showing cribriform gland with irregular border (H&E, 40X)

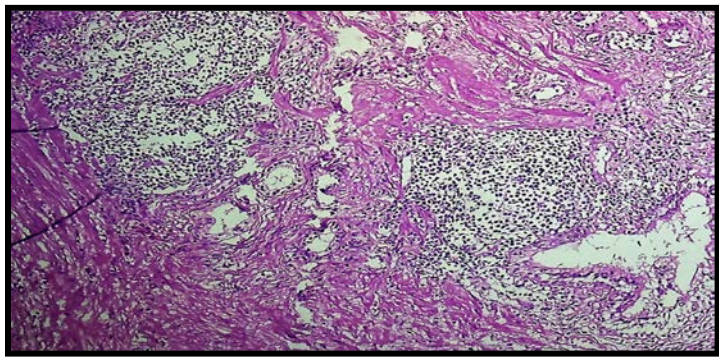

Fig 3: Chronic severe prostatitis showing infiltration of lymphocytes, plasma cells and histiocytes in the stroma (H&E, 100X)

Table11. Serum PSA levels in the cases studied

		Final DIAGNOSIS					
		BPH		ADENOCARCINOMA		UROTHELIAL CA	
		Count	Column N %	Count	Column N %	Count	Column N %
PSA (ng/ml)	0-4	70	46.4%	0	0.0%	1	33.3%
	4 to 10	43	28.5%	3	11.5%	1	33.3%
	>10	38	25.2%	23	88.5%	1	33.3%
Inference	**P value <0.001-significant correlation. Thus serum PSA levels as per above three catagories>10 are 8.21 times**						

Table 2: Correlation between serum PSA and Prostatitis.

		PSA (ng/ml)					
		0-4		4 TO 10		>10	
		Count	Column N %	Count	Column N %	Count	Column N %
PROSTATITIS	Mild	1	1.4%	11	23.4%	9	14.5%
	Moderate	2	2.8%	2	4.3%	6	9.7%
	Severe	0	0.0%	3	6.4%	11	17.7%
Inference	**P value <0.001-significant correlation of inflammation and PSA; Patients with severe prostatitis had serum PSA levels >10.**						

Conclusion

Prostatic diseases are usually seen in men after age of 50 years and is common in the age group of 65-75years.Commonest pathological lesion seen is Nodular hyperplasia followed by adenocarcinoma. PSA was a good tool for screening prostatic carcinoma. More studies are needed especially in relation to benign mimickers and PSA to avoid false diagnosis of adenocarcinoma prostate.

References

1. Lin K, Lipsitz R, Miller T, Janakiraman S, U.S. Preventive Services Task Force . Benefits and harms of prostate-specific antigen screening for prostate cancer: an evidence update for the U.S. Preventive Services Task Force. Ann Intern Med2008;149:192-9.
2. Vickers AJ. Prostate cancer screening: time to question how to optimize the ratio of benefits and harms. Ann Intern Med2017;167:509-10.
3. Djulbegovic M, Beyth RJ, Neuberger MM, et al. Screening for prostate cancer: systematic review and meta-analysis of randomised controlled trials. BMJ2010;341:c4543.
4. Ilic D, Neuberger MM, Djulbegovic M, Dahm P. Screening for prostate cancer. Cochrane Database Syst Rev2013;(1):CD004720.
5. Misra-Hebert AD, Hu B, Klein EA, et al. Prostate cancer screening practices in a large, integrated health system: 2007-2014. BJU Int2017;120:257-64.
6. Han PK, Kobrin S, Breen N, et al. National evidence on the use of shared decision making in prostate-specific antigen screening. Ann Fam Med2013;11:306-14.
7. Moyer VA, U.S. Preventive Services Task Force. Screening for prostate cancer: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med2012;157:120-34.

8. Fenton JJ, Weyrich MS, Durbin S, Liu Y, Bang H, Me lnikow J. Prostate-specific antigen-based screening for prostate cancer: evidence report and systematic review for the US Preventive Services Task Force. JAMA2018;319:1914-31.
9. Martin RM, Donovan JL, Turner EL, et al., CAP Trial Group. Effect of a low-intensity PSA-based screening intervention on prostate cancer mortality: the CAP randomized clinical trial. JAMA2018;319:883-95.
10. Siemieniuk RA, Agoritsas T, Macdonald H, Guyatt G H, Brandt L, Vandvik PO. Introduction to BMJ Rapid Recommendations. BMJ2016;354:i5191.
11. Tikkinen KAO, Dahm P, Lytvyn L, et al. Prostate cancer screening with prostate-specific antigen (PSA) test: a clinical practice guideline. BMJ2018:362:k3581.
12. Vernooij RWM, Lytvyn L, Pardo-Hernandez H,et al. Values and preferences of men for undergoing prostate-specific antigen screening for prostate cancer: a systematic review. BMJ Open2018;0:e025470.
13. Dahm P, Djulbegovic M, Ilic D, et al. Screening for prostate cancer. PROSPERO 2016:CRD42016042347.
14. Booth N, Rissanen P, Tammela TL, Määttänen L, Taa ri K, Auvinen A . Health-related quality of life in the Finnish trial of screening for prostate cancer. Eur Urol2014;65:39-47.
15. Kilpeläinen TP, Tammela TL, Roobol M, et al. False-positive screening results in the European randomized study of screening for prostate cancer. Eur J Cancer2011;47:2698-705.
16. Thompson IM, Pauler DK, Goodman PJ, et al. Prevalence of prostate cancer among men with a prostate-specific antigen level < or =4.0 ng per milliliter. N Engl J Med2004;350:2239-46.
17. Hamdy FC, Lane JA, et al., ProtecT Study Group. Patient-reported outcomes after monitoring, surgery, or radiotherapy for prostate cancer. N Engl J Med2016;375:1425-37.
18. Rosario DJ, Lane JA, Metcalfe C, et al. Short term outcomes of prostate biopsy in men tested for cancer by prostate specific antigen: prospective evaluation within ProtecT study. BMJ2012;344:d7894.
19. Miller KD, Siegel RL, Lin CC, et al. Cancer treatment and survivorship statistics, 2016. CA Cancer J Clin2016;66:271-89.
20. Higgins JP, Altman DG, Gøtzsche PC, et al., Cochrane Bias Methods Group, Cochrane Statistical Methods Group. The Cochrane Collaboration's tool for assessing risk of bias in randomised trials. BMJ2011;343:d5928.
21. Guyatt GH, Oxman AD, Vist GE, et al., GRADE Working Group. GRADE: an emerging consensus on rating quality of evidence and strength recommendations. BMJ2008;336:924-6.
22. Lundgren PO, Kjellman A, Norming U,Gustafsson O. Long-term outcome of a single intervention population based prostate cancer screening study. J Urol2018;200:82-8.
23. Fleiss JL The statistical basis of meta-analysis. Stat Methods Med Res1993;2:121-45.
24. Guyatt GH, Oxman AD, Kunz R, et al. GRADE guidelines 6. Rating the quality of evidence--imprecision. J Clin Epidemiol2011;64:1283-93.