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Pathology

A HISTOPATHOLOGICAL STUDY OF LESIONS OF PROSTATE IN GOA MEDICAL COLLEGE

Dr. Shirodkar Daksha — MD, Department of Pathology, Goa Medical College, Bambolim Goa 403202

Dr. Mandrekar Suresh — MD, DNB, Associate Professor, Department of Pathology, Goa Medical College, Bambolim Goa 403202

Dr. Francisco Couto — MD, FICP, Associate Professor and Head of Department, Department of Pathology, Goa Medical College, Bambolim Goa 403202

ABSTRACT **Background:** Common prostatic diseases include inflammatory lesions (prostatitis), benign prostatic hyperplasia (BPH), and carcinoma. In men older than 50 years, Carcinoma of prostate is ranked as the second most common cause of cancer related deaths, the incidence of which increases with increasing age. Prostate specific Antigen(PSA) is an important tumour marker for prostate cancer. **Aims & Objective:** The objective of this study was to assess histopathological spectrum of prostatic lesions, their age distribution and its correlation with PSA levels. **Materials & Method:** This is a retrospective study, conducted in Goa Medical College a tertiary care hospital from January 2015 to December 2019. All the prostatic specimens received and examined histopathologically in the Department of Pathology of Goa Medical College were included in this study. Brief clinical data were noted including the age, serum PSA levels and clinical diagnosis. Using standard histopathological processing techniques, sections of 5 microns thick were prepared and were stained with hematoxylin and eosin. The lesions were classified into benign, non-neoplastic and neoplastic lesions. Prostatic adenocarcinoma was graded using Gleason microscopic grading. The findings were analyzed and compared with other similar studies. **Results:** Total 390 prostatic specimens were studied, out of which 73.07% were benign and malignant lesions accounted for 24.61%. Among 271 cases of BHP, 235 cases (86.71%) had significant prostatitis and 36 cases (13.28%) did not have significant prostatitis. Chronic Prostatitis was commonly associated with BHP. Prostatic carcinoma was diagnosed in 95 (24.35%) cases with most cases seen in the 6th decade. Youngest patient in this study was 37 years old. All the malignant lesions, were prostatic adenocarcinoma. Most commonly Gleason's score 7 was observed. In 95(98.95%) cases of prostate cancer the serum PSA levels were elevated to >4ng/ml.

KEYWORDS : Prostate, Lesions, Benign, Malignant

INTRODUCTION

Common prostatic diseases include inflammatory lesions (prostatitis), benign prostatic hyperplasia (BPH), and Carcinoma of prostate.In BPH there is a nodular enlargement of the prostate caused due to proliferation of both glandular and stromal components. The incidence of BPH in the fourth decade is 8 % which increases with age, reaching 50% during the fifth decade and by the eighth decade it reaches upto 75%.(1) Prostatitis is seen in approximately 10- 15% of men.(2) Prostatitis may be classified as acute, chronic and granulomatous and is a commonly associated with BPH. The most widely recognised premalignant lesion in the prostate is Prostatic intraepithelial neoplasia (PIN). The first description of the premalignant changes in prostate was given by Orteil.

PIN is defined as a cytological alteration in architecturally normal glands and is further divided into low grade (LGPIN) and high grade (HGPIN). In men older than 50 years, Carcinoma of prostate is ranked as the second most common cause of cancer related deaths, the incidence of which increases with increasing age (3). Morphological features such as growth pattern, nuclear atypia, and absence of basal cells form the basis for histological diagnosis of prostatic cancer. Parallel increase in incidence is seen with both benign prostatic hyperplasia and carcinoma prostate with advancing age (4). PSA is an important tumour marker for prostate cancer (5). Transitional zone of prostate is the area where hyperplasia originates from; whereas peripheral zone is the site for carcinoma(6). The sixth leading cause of cancer death in males is Prostate carcinoma(7). Moreover, few studies have been done in India on prostatic lesions. This prompted us to investigate the clinicopathological correlation of prostatic biopsies with special reference to serum Prostate specific antigen (PSA) levels in the patients.

MATERIALS & METHOD

This is a retrospective study, conducted in Goa Medical College from January 2015 to December 2019. All prostatic specimens which were received, and studied histopathologically in the Department of Pathology of Goa Medical College were included in this study. Brief clinical data were noted including the age, serum PSA levels and clinical diagnosis. The specimens received were fixed in 10% formalin. Routine gross examination of specimens was done. In case of TURP and needle biopsy, entire tissue was processed and in cases of prostatectomy specimens, sections were taken from suspicious areas. Further tissue was processed using standard techniques for paraffin sections. Sections of 5 microns thick were prepared and were stained routinely with hematoxylin and eosin. The lesions were classified into benign, non-neoplastic and neoplastic categories. Prostatic adenocarcinoma was graded using Gleason microscopic grading. The findings were analyzed and compared with other similar studies.

RESULTS

Total 390 prostatic specimens were studied, out of which 73.07% were benign lesions and malignant lesions accounted for 24.61%. (Table 1).Benign lesions were common in the 6th decade. The youngest patient with BHP was 39 years old. Among 271 cases of BHP, 235 cases (86.71%) had significant prostatitis and 36 cases (13.28%) did not have significant prostatitis.(Table 2). Chronic Prostatitis was commonly associated with BHP. A single case of granulomatous prostatitis was seen in 43 year old male. PIN accounted for 3.33% (13 cases), out of which 10 cases were associated with prostatitis & 1 case was associated with Adenocarcinoma which was seen in a 75 year old. (Table 3).Prostatic carcinoma was diagnosed in 95 (24.35%) cases with most cases seen in the 6th decade, and the youngest patient was 37 years old. All the malignant lesions, were prostatic adenocarcinoma. Most commonly Gleason's score 7 was observed.(Table 5).In 9 (2.3%) cases results were inconclusive. In benign lesions serum PSA was below 4ng/dl in 76 cases (26.66%). In BHP with prostatitits 85(36.17%) had PSA levels in the range of 4- 8.00ng/ml. In 22 (7.7%) benign cases PSA levels were not available. In 95(98.95%) malignant prostatic lesion the serum PSA levels were >4ng/ml. Serum PSA level was not available in one case.(Table 4).

Table 1: Age Wise Distribution Of Various Prostatic Lesions

AGE GROUP	GRANULOMATOUS INFLAMMATION		BHP		BHP WITH PROSTATITIS		ATYPICAL SMALL ACINAR CELL PROLIFERATION		BHP WITH PIN		PIN		ADC		ADC WITH PIN		INCONCLUSIVE		TOTAL	
	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%
31-40	0	0	0	0	1	0.42	0	0	0	0	0	0	1	1.05	0	0	1	11.11	3	0.76
41-50	1	100	0	0	5	2.12	0	0	0	0	0	0	2	2.10	0	0	0	0	8	2.05
51-60	0	0	5	33.8	35	14.89	0	0	2	20	0	0	16	16.84	0	0	0	0	58	14.87
61-70	0	0	23	63.88	132	56.17	0	0	6	60	1	50	57	59.94	0	0	2	22.22	201	51.53
71-80	0	0	8	2.22	56	23.97	0	0	2	20	1	50	32	33.68	1	100	6	66.66	104	26.66
81-90	0	0	0	0	8	3.40	1	100	0	0	0	0	7	7.36	0	0	0	0	16	4.10
TOTAL =390	01	0.25	36	9.23	235	60.25	1	0.25	10	2.56	2	0.85	95	24.35	1	0.25	9	2.30	390	100

Table 2: Distribution Of Cases Of Prostatitis

TYPE OF PROSTATITIS	NO. OF CASES	PERCENTAGE%
ACUTE PROSTATITIS	5	2.11
GRANULOMATOUS PROSTATITIS	1	0.42
CHRONIC PROSTATITIS	230	97.45
TOTAL	236	100

Table 3: Pin Cases Distribution

CASES OF PIN	NO. OF CASES	PERCENTAGE %
PIN	2	15.38
PIN WITH PROSTATITIS	10	76.92
PIN WITH CARCINOMA	1	7.69
TOTAL	13	100

Table 4: Correaltion Of PSA Levels & Various Prostatic Lesions

PSA LEVELS (ng/ml)	GRANULOMATOUS INFLAMMATION		BHP		BHP WITH PROSTATITIS		ATYPICAL SMALL ACINAR CELL PROLIFERATION		BHP WITH PIN		PIN		ADC		ADC WITH PIN		INCONCLUSIVE		TOTAL
	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%
0-4.00	1	100	10	27.77	63	26.80	0	0	1	10	1	50	0	0	0	0	3	33.33	79	20.25
4.01-8.00	0	0	13	36.11	85	36.17	0	0	2	20	0	0	0	0	0	0	0	0	100	25.64
8.01-16.00	0	0	7	19.44	50	21.27	0	0	1	10	0	0	5	5.26	0	0	2	22.22	65	16.66
16.01-24.00	0	0	3	8.33	8	3.40	0	0	4	40	1	50	9	9.47	0	0	1	11.11	26	6.66
24.01-32.00	0	0	0	0	4	1.70	0	0	0	0	0	0	1	1.05	0	0	0	0	5	1.28
32.01-40.00	0	0	0	0	2	0.85	0	0	1	10	0	0	2	2.10	0	0	0	0	5	1.28
40.01-100.00	0	0	0	0	4	1.70	1	100	1	10	0	0	56	58.94	1	100	3	33.33	66	16.92
MORE THAN 100	0	0	0	0	0	0	0	0	0	0	0	0	21	22.10	0	0	0	0	21	5.38
N.A	0	0	3	8.33	19	8.08	0	0	0	0	0	0	1	1.05	0	0	0	0	23	5.89
TOTAL CASES	1	100	36	100	235	100	1	100	10	100	2	100	95	100	13	100	9	100	390	100

Table 5: Gleasons Score In Adenocarcinoma Of Prostate

AGE GROUP	GS UPTO 6		GS UPTO 7		GS <=8	
	No.	%	No.	%	No.	%
31-40	0	0	1	2.38	0	0
41-50	1	3.03	1	2.38	0	0
51-60	6	18.18	8	19.04	2	9.09
61-70	12	36.36	16	38.09	9	40.90
71-80	10	30.30	13	30.95	10	45.45
81-90	3	9.09	3	7.14	1	4.54
TOTAL 96	32	34.37	42	43.75	22	22.91

Table 6: Correalation Between Gleasons Score & Psa Levels

PSA LEVELS (ng/ml)	GS UPTO 6		GS UPTO 7		GS =>8	
	NO.	%	NO.	%	NO.	%
<4.00	0	0	0	0	0	0
4.01-8.00	0	0	0	0	0	0
8.01-16.00	2	6.25	3	7.14	0	0
16.01-24.00	3	9.37	5	11.90	1	4.54
24.01-32.00	1	3.12	0	0	0	0
32.01-40.00	1	3.12	0	0	1	4.54
40.01-100.00	22	68.75	26	61.90	9	40.90
>100.00	2	6.25	8	19.04	11	50
N.A	1	3.12	0	0	0	0
TOTAL	32	100	42	100	22	100

Table 7: PSA Levels & Biopsy Results

PSA LEVELS (ng/ml)	POSITIVE		NEGATIVE		INCON-CLUSIVE		TOTAL	
	NO.	%	NO.	%	NO.	%	NO.	%
LESS THAN OR EQUAL TO 4.00	0	0	76	26.66	3	33.33	79	20.25
MORE THAN 4.01	95	98.95	187	65.61	6	66.66	288	73.84
N.A	1	1.04	22	7.71	0	0	23	5.89
TOTAL	96	24.61	285	73.07	9	2.3	390	100

DISCUSSION

The present study was conducted in Goa Medical College, Bambolim Goa from January 2015- December 2019.

A total number of 390 prostatic specimens were studied which constituted 0.84% of total histopathological specimens received.

Most number of prostatic specimens were received in 2016. Most of the prostatic specimens were received from the patients in the age group of 61-70 years, accounting for 51.5% of total specimens, followed by 71-80 years consisting of 26.6%.

Majority of specimens received were TURP-324(83.07%), followed by needle biopsy specimens -63(16.15%) followed by 3(0.76%) radical prostectomy specimens, findings similar to those findings reported by Puttaswamy et al (8), which showed TURP specimens - 88.70% and needle biopsy specimens -11.30%. & Anushree et al (9) which showed TURP specimens-89.3% & needle biopsies –8% .

BHP With Significant degree of Prostatitis was the most frequent histopathological finding observed, accounting for total of 235 (60.25%) cases. The findings being similar to other studies like George &Thomas (10) ,Talukder et.al(11), Sinha et al(12), Aslam et.al(13) ,Deshmukh et.al (14), Nwafor C et al(15),Puttaswamy et. al(8) , Sharma et al(16),Farooq S et al(17). The youngest patient with BHP was 39 years old. Most common age group being affected was 61-70 years with 132 cases (56.17%) followed by 71-80 years with 54 cases (22.97%). The findings are similar to other studies by Aslam et al (13) (87.5%) and Talukder et al (11) (77.4%).

Total 36(9.23%) cases of BHP with no significant inflammation were seen, again showing a peak in 6th decade accounting 23(66.88%) cases, followed by 5th decade accounting 5 (13.8%) cases.

Prostatitis was categorized into acute, chronic & granulomatous.

Chronic Prostatitis was most commonly seen to be associated with BHP- 230 cases(97.45%).These cases showed diffuse infiltration of glands & stroma by lymphocytes,plasma cells & histiocytes.

Acute Prostatitis was seen in 5 (2.11%) cases followed by Granulomatous Prostatitis in 1 case (0.42%),showing granulomas & multinucleated giant cells.

The patient with Granulomatous Prostatitis was 43 years old, there were non caseating granulomas. These findings are more or less similar to the studies of Garg et al (18), Puttaswamy K et al (8) and Sharma et al.(16)

In this present study one case of Atypical small acinar cell proliferation was seen in 86 years old.

A total 13 (3.33%) cases of PIN were reported, out of which 10(76.92%) were associated with prostatitis & only one case was associated (7.69%) with carcinoma.

PIN with BHP age group mostly affected was 61-70 years, whereas only one case of PIN with Adenocarcionma was seen in 75 year old.

Prostatic carcinoma was diagnosed in 95(24.35%) cases.It accounted 1.41% cases of total malignancies diagnosed over the 5 year period. All of these were histologically Adenocarcinoma(ADC). Most cases were seen in year 2018. Maximum number of cases were in the age group of 61-70 years accounting for 37(38.94%) cases followed by 71-80 years-32(33.68%) cases.

Majority of cases were of Gleason's score 7 accounting for 42(43.75%) cases, of these highest number were seen in 6th decade -16 (38.09%) followed by 7th decade- 13 (30.95%) .Gleason's score upto 6 was seen in 32 (34.37%) cases again showing peak in 6th decade -12 (36.36%) followed by 7th decade -10 (30.30%) cases. Total 22 (22.91%) cases were with Gleason's score=>8 most cases were in 7th decade-10 (45.45%) followed by 6th decade – 9(40.90%) cases.

From 3rd to 8th decade most commonly Gleason's score 7 was observed.

Youngest patient with adenocarcinoma was 37 years old.

Results were inconclusive in total 9 (2.3%) cases.

PSA Levels were also noted in different cases. 76(26.66%) benign cases had PSA levels below or equal to 4.00ng/ml, 187 (65.61%) had levels more than 4.01ng/ml & in 22(7.71%) cases PSA levels were not available. Similar findings were observed by Anushree et al(9) where 55.14% benign lesions had PSA levels below 4 ng/ml and 85.71% malignant lesions had PSA levels above 4 ng/ml. In 95 cases of adenocarcinoma (98.95%) PSA levels were above 4.01ng/ml. In one case PSA levels were not available. Further, PSA levels were divided into multiples of 4, 13(36.11%) cases of BHP had PSA levels in the range of 4.01-8.00ng/ml followed by 10 (27.77%) cases having PSA below 4.00ng/ml.

In BHP with Prostatitis, most -85(36.17%) had PSA levels in the range of 4.01-8.00ng/ml, followed by 63 (26.80%) cases having PSA levels below 4.00ng/ml. Umbehr et al., in his study showed that acute and chronic inflammation of prostate is more commonly associated with high levels of serum PSA(19). Kiehl et al., in their study found that in BPH and prostatitis PSA is elevated when glandular epithelium is disrupted (20). Papsidero LD et al. suggested that the inflammatory processes occurs due to release of unknown substances by epithelial cells causing elevation of PSA (21).

With Adenocarcinoma-56 (58.94%) cases had PSA levels in the range of 40.01-100.00ng/ml, followed by21 (22.10%) cases having PSA above 100.01ng/ml. Lekhli et al. concluded in his study that 32% of prostate adenocarcinoma patients had serum PSA value >20 ng/ml(22).Anushree et al observed in their study that 24% of prostate adenocarcinoma patients had serum PSA >20 ng/ml(9). Overall Benign lesions 285 (73.07%) were more common than malignant lesions 96 (24.61%), findings similar to other studies by Puttaswamy et al.(8) and Benerjee B et al.(23) who also encountered benign lesions constituting 80.6%, 75% and malignant lesions constituting 19.4%, 25%. respectively.

CONCLUSION

1. Total 390 prostatic specimens were studied, out of which 73.07% were benign lesions and malignant lesions accounted for 24.61%.
2. Benign lesions were common in the 6th decade. The youngest patient with BHP was 39 years old.
3. Among 271 cases of BHP, 235 cases (86.71%) had significant prostatitis and 36 cases (13.28%) did not have significant prostatitis.
4. Chronic Prostatitis was commonly associated with BHP. A single case of granulomatous prostatitis was seen in 43 year old male.
5. PIN accounted for 3.33% (13 cases), out of which 10 cases were associated with prostatitis & 1 case was associated with Adenocarcinoma seen in 75 year old.
6. Prostatic carcinoma was diagnosed in 95 cases (24.35%) with most cases seen in 6th decade, youngest patient was 37 years old.
7. All the malignant lesions, were prostatic adenocarcinoma.
8. Most commonly Gleason's score 7 was observed.
9. In 9 cases (2.3%) results were inconclusive.
10. In benign lesions serum PSA was below 4ng/dl in 76 cases (26.66%).
11. In BHP with prostatitits 85(36.17%) had PSA levels in the range of 4- 8.00ng/ml. Rise in PSA could be because of associated inflammation.
12. In 22 benign cases (7.7%) PSA levels were not available.
13. In 95 malignant prostatic lesions (98.95%) showed serum PSA levels (>4ng/ml). Serum PSA level was not available in one case.

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