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Original Research Article

Age Distribution of Various Prostatic Lesions: Hospital Based Study

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Abstract:

Introduction: Benign prostatic hyperplasia and prostatic adenocarcinoma are the common prostatic diseases found in most of the patients. There is increase in incidence of BPH worldwide and predicts by the age of 60 years more than 50% of men will have microscopic evidence of the disease. Although the etiology of prostatic cancer remains unknown, the most consistent risk factors are advanced age and racial/ethnic factors. Hence present study was an effort to find age distribution of various prostatic lesions.

Objectives: To determine the age distribution of patients with prostatic lesions of Gwalior region.

Materials and Methods: Study was conducted in the Department of Pathology, Gajra Raja Medical College and J.A. Group of Hospitals, Gwalior (M.P.) over prostatic specimens that received over a period from 2015-2017. The prostatic specimens include transurethral resection of prostate chips, prostatectomy specimen and needle biopsy samples.

Result: Among benign lesions 05 cases (5.5%) are in age group 40-49 years, 17 (18.7%) in 50-59 years, 35 (38.4%) in 60-69 years, 26 (28.5%) 70-79 years, and 07 (7.7%) in 80-89 years, 01 (1.1%) in 90-99 years. 2 cases (11.8%) of Prostate adenocarcinoma are in age group 40-49 years. 6 (35.3%), 5 (29.4%) and 4 (23.5%) cases are in 60-69, 70-79 and 80-89 years age group respectively. Correlation is statistically not significant. Highest Gleason score found was 8 and maximum number of Gleason score 8 cases are in age group 80-89 years.

Conclusion: Present study shows both benign and malignant lesions are more common in older age group mostly above 60 years of age. Severity of prostatic adenocarcinoma also seems to be higher for older age patients.

Keywords: Prostate, Age, BPH, Adenocarcinoma.

Introduction

Benign prostatic hyperplasia and prostatic adenocarcinoma are the common prostatic diseases found in most of the patients [1].

A recent American Urological Association (2003) guideline suggests an increase in incidence of BPH worldwide and predicts by the age of 60 years more than 50% of men will have microscopic evidence of the disease and by the age of 85 years as many as 90% of men will be affected. Very few studies conducted on BPH patients from India suggest BPH as most common pathological condition of prostate with incidence of 92.97%(n=185) & 93.3% (n=200).However actual current incidence of BPH will require valid scientific evidence from pooled data and India as a whole lacks large scale screening database of patients with prostatic disease [2].

BPH and bladder outflow obstruction (BOO) have substantial adverse effects on the public health. In a study of 3.7 million US men presenting to emergency rooms in the state of California, the incidence of urinary retention increased 25% from 2007 to 2010.

One more public health issue related with prostate lesions is the costs incurred on diagnosis and treatment. In 2000, BPH accounted for $1.1 billion dollars in direct health-care expenditures, lacs and millions of office visits, emergency room visits, hospitalizations and 21-38 million h in lost productivity in the US estimated annual costs of BPH treatment and total of at least $3.9 billion dollars [3].

Among adult males prostate cancer is the most common neoplasm in most developed countries.

The age standardized incidence of prostate cancer in the Europian union is 65/1 lac and mortality rate is 26/1 lac per year. Prostate cancer incidence is increasing in India. Currently, it ranks 5th in incidence and 4th in mortality for men in Mumbai [4].

Age, race/ethnicity and family history are the established risk factors for prostate cancer. Various risk factors under investigation are migration, diet, obesity, height, endogenous androgen level, concomitant medical conditions like liver cirrhosis, diabetes, BPH , prostatitis, and certain drugs [5].

Although the etiology of prostatic cancer remains unknown, the most consistent risk factors are advanced age and racial/ethnic factors [6].

Incidence of serious progression of BPH to events like acute urinary retention and BPH related surgery is low. But when left untreated disease progression occur significantly to affect quality of life. There are seven baseline variables which predicts LUTS/BPH progression which includes age, severity of LUTS at baseline, prostate volume, prostate specific antigen levels, peak urinary flow rate (Q_{max}), post void residual urine (PVR) and prostatic inflammation [7].

Between 1976 and 1994, rate of prostate cancer was doubled while there is 20% increase in mortality. The reasons for the increase were not known but increasing life expectancy, growing disease prevalence resulting from environmental carcinogens and increasing use of diagnosing modalities have been suggested as causes. Prostate cancer increases faster with age than does any other malignancy, and with an increase in the elderly population because of longer life expectancy, prostate cancer will continue to be a major health problem [8]. Age adjusted incidence rates (AAR) of prostate cancer for the period 2005-2008 ranged from 0.8 (Manipur state excluding Imphal west) to 10.9 (Delhi) per 1 lac person-years. Mean annual percentage change (MAPC) in crude incidence rate(CR) ranged from 0.14 (Ahmedabad) to 8.6 (Chennai) . Increase in trend was seen in the 55-64 year age group cohort in many registries and in the 35-44 age group in Metropolitan cities such as Delhi and Mumbai [9].

With age the structure of DNA got modified which is thought to be responsible for the development of prostate cancer in older men. 42% of older men (ages 55–80), exhibited a DNA phenotype mimicking that of primary prostate tumors. Hydroxyl radical contributed to the structural changes that characterize the cancer-like phenotype. DNA of primary prostate tumors and the DNA of primary prostate tumors which caused distant metastases are different. These findings can identify men at risk for developing prostate cancer, as well as for the early determination of whether a primary tumor has progressed to the metastatic state [10]. In organ confined Prostate cancer Gleason score, capsular invasion, blood PSA, stage and aneuploidy are best marker of progression while in advanced disease Gleason score and nuclear morphometry can be used as predictors of progression [11]. Older patients of different age groups differed significantly in their pretreatment characteristic. Patients >74 years had significantly higher pretreatment PSA, higher grade disease [12]. Hence present study was an effort to find age distribution of various prostatic lesions.

Objectives

To determine the age distribution of patients with prostatic lesions of Gwalior region

Materials and Methods

Study design: Prospective study

Study was conducted in the Department of Pathology, Gajra Raja Medical College and J.A. Group of Hospitals, Gwalior (M.P.) overprostatic specimens that received over a period from 2015-2017.The prostatic specimens include transurethral resection of prostate chips, prostatectomy specimen and needle biopsy samples.

Age of the patients whose prostatic specimen was sent mentioned on their requisition form. Histopathological examination was done on H & E stained section and prostatic lesions were diagnosed. Age distribution of various prostatic lesions was assessed. Autolysed samples and specimens with incomplete documentations were not included in study.

Statistical Analysis

Statistical analysis was done using Chi-square test for relation of age-group with benign and malignant lesions, p-value <0.05 was considered statistically significant.

Results

Table 1: Age distribution of benign prostatic lesions

Age Group (years)	BPH	Chronic Prostatitis	Total benign lesion
40-49	05 (5.6%)	0	05 (5.5%)
50-59	17 (19.1%)	0	17 (18.7%)
60-69	34 (38.2%)	1 (50%)	35 (38.4%)
70-79	25 (28.1%)	1 (50%)	26 (28.5%)
80-89	07 (7.8%)	0	07 (7.7%)
90-99	01 (1.1%)	0	01(1.1%)

Table 1 shows distribution of prostatic lesions in various age groups.

BPH cases are 05 (5.6% of all BPH cases) in age group 40-49 years, 17 (19.1%) in 50-59 years, 34 (38.2%)in 60-69 years, 25 (28.1%)in 70-79 years, and 07 (7.8%) in 80-89 years, 01 (1.1%) in 90-99 years. 1 case of Chronic prostatitis (50% of Chronic prostatitis cases) is in 60-69 years and 1 (50%) in 70-79 years age group. Total benign lesions in age group 40-49 years are 05 (5.5% of all benign lesions) in number, 17 (18.7%) in 50-59 years, 35 (38.4%) in 60-69 years, 26 (28.5%) 70-79 years, and 07 (7.7%) in 80-89 years, 01 (1.1%) in 90-99 years.

Table 2: Age distribution of pre-malignant and malignant prostatic lesions

Age Group (years)	PIN	Carcinoma
40-49	0	2 (11.8%)
50-59	1 (33.3%)	0
60-69	0	6(35.3%)
70-79	1 (33.3%)	5 (29.4%)
80-89	1(33.3%)	4 (23.5%)

Table 2 shows 1 case (33.3% of all PIN cases) is in 50-59 years age group, 1 (33.3%) in 70-79 years and 1 case (33.3%) is in 80-89 age group.

2 cases (11.8% of carcinoma cases) of Prostate adenocarcinoma are in age group 40-49 years. 6 (35.3%), 5 (29.4%) and 4 (23.5%) cases are in 60-69, 70-79 and 80-89 years age group respectively.

Table 3: Mean, median, minimum and maximum age of prostatic lesions

Age in years	BPH	BPH with Prostatitis	Chronic Prostatitis	PIN	Carcinoma
Mean Age	66.4	63.1	65	70	68.5
Median Age	65	65	65	70	70
Minimum Age	45	40	60	55	45
Maximum Age	86	90	70	85	85

Table 3 shows mean age for BPH is 66.4 years, for BPH with prostatitis is 63.1 years, for Chronic prostatitis is 65 years, for PIN is 70 years and for carcinoma mean age is 68.5 years. Median age of BPH, BPH with prostatitis, and chronic prostatitis is 65 years while for PIN and adenocarcinoma it is 70 years. Minimum age for BPH and adenocarcinoma cases is 45 years, for BPH with prostatitis minimum age is 40 years, for chronic prostatitis 60 years and for PIN it is 55 years.Maximum age for BPH, BPH with prostatitis and chronic prostatitis are 86, 90 and 70 years respectively, while for PIN and carcinoma maximum age is 85 years.

By using Chi-square test for correlation of age-group with benign and malignant lesions –Chi-square was 7.8 and p-value 0.167, thus difference is statistically insignificant.

Table 4: Distribution of Gleason score in cases of adenocarcinoma of prostate

Gleason Score	No. of Cases	% of Cases
5 (3+2)	1	5.9
6 (3+3)	3	17.6
6 (4+2)	1	5.9
7 (3+4)	2	11.7
7 (4+3)	5	29.4
8 (4+4)	2	11.7
8 (5+3)	3	17.6

Table 4 shows Gleason score 5 is found in 5.9% (1 case) of adenocarcinoma of prostate. Gleason score 6 in 23.5% (4 cases), 17.6% (3 cases) have (3+3), 5.9% (1 case) have (4+2).Gleason score 7 in 41.2% (7 cases), 11.8% (2 cases) have (3+4), 29.4% (5 cases) have (4+3).Gleason score 8 in 29.4% (5 cases), 11.8% (2 cases) have (4+4), 17.6% (3 cases) have (5+3).Gleason score 7 is most common (41.2%) followed by Gleason score 8 (29.4%).

Table 5: Age distribution for Gleason score of adenocarcinoma prostate

Age group (years)	Gleason Score				Total carcinoma cases
	5	6	7	8	
40-49	0	1 (50%)	0	1 (50%)	2
50-59	0	0	0	0	0
60-69	1 (16.6%)	1 (16.6%)	4 (66.7%)	0	6

70-79	0	2 (40%)	2 (40%)	1 (20%)	5
80-89	0	0	1 (25%)	3 (75%)	4

Table: 5 shows in age group 40-49 years, 50% (1 case) of patient has Gleason score 6 and 50% (1 case) has Gleason score 8.In age group 60-69 years, 16.6% (1 case) of patient has Gleason score 5, 16.6% (1 case) has Gleason score 6, 66.7% (4 case) of patients have Gleason score 7.In age group 70-79 years, 40% (2 case) have Gleason score 6, 40% (2 case) have Gleason score 7, 20% (1 case) has Gleason score 8.In age group 80-89 years, 25% (1 case) has Gleason score 7 and 75% (3 cases) have Gleason score 8.Maximum number of Gleason score 8 cases (3 out of 5) are in age group 80-89 years.

Discussion

In the present study total prostatic lesions in age group 40-49 years are 7 cases (6.3% of all cases). Prostatic lesions in 50-59 years are 18 cases (16.2%), 41 cases (36.9%) in 60-69 years, 32 cases (28.8%) in 70-79 years, 12 cases (10.8%) in 80-89 years and 1 case (0.9%) in 90-99 years age group which is comparable to study conducted by Obiorah CC et al [13] and Kumar M et al [14].

Age-wise distribution of prostatic lesions was 1% in 40-49 years, 13.1% in 50-59 years, 29.3% in 60-69 years, 40.4% in 70-79 years and 16.2% in ≥80 years age group in the study of Obiorah CC et al [13]. In the study conducted by Kumar M et al [14].50% of prostatic lesions were in age group 60-69 years, 27.3% in 70-79 years and 5.3% in 80-89 years age group.

In our study more than 75% of all prostatic lesions are beyond 60 years of age and more than 90% beyond 50 years of age. Maximum patients are in age group 60-69 years.

Age-wise distribution of benign lesions in our study is 05 cases (5.5% of all benign lesions) in age group 40-49 years, 17 cases (18.7%) in 50-59 years, 35 cases (38.4%) in 60-69 years, 26 cases (28.5%) in 70-79 years, 07 cases (7.7%) in 80-89 years and 1 case (1.1%) in 90-99 years age group and is comparable to study conducted by Albasri A et al [15] in Saudi Arabia which showed age-wise distribution of benign lesions was 0.8% in age group <40 years, 2.4% in age group 40-49 years, 9.6% in 50-59 years, 31.2% in 60-69 years, 36.7% in 70-79 years, 17.8% in 80-89 years and 1.5% in ≥ 90 years. Total samples with benign lesions in our study are 91 while in study of Albasri A et al [15] they were 343. Difference in sample size, geographical variation and dietary difference may be the cause of minor variation in age distribution.

In our study 05 cases of BPH (5.6% of all BPH cases) are in age group 40-49 years, 17 cases (19.1%) in 50-59 years, 34 cases (38.2%) in 60-69 years, 25 cases (28.1%) in 70-79 years, 07 cases (7.8%) in 80-89 years and 01 case (1.1%) in 90-99 years age group which is comparable to study conducted by Kumar M et al [14] inwhich 16.1%, 51.9%, 28.2% and 3.8% cases of BPH were in 50-59 years, 60-69 years, 70-79 years and 80-89 years age groups respectively.

In the present study 33.3% (1 case) of all PIN lesions is in 50-59 years, 33.3% (1 case) is in 70-79 years and 33.3% (1 case) is in 80-89 years age group respectively while in study conducted by Kumar M et al [14] 66.7% and 33.3% of PIN lesions were in 50-59 years and 70-79 years age group respectively. Only 3 cases show PIN lesion in our study so it may not show exact reflection of age distribution of PIN lesions.

11.8% (2) cases of adenocarcinoma of prostate are in age group 40-49 years, 35.3% (6) cases, 29.4% (5) cases and 23.5% (4) cases are in 60-69 years, 70-79 years and 80-89 years age group respectively in our study and is comparable to study conducted by Albasri A et al [15] which showed 1.4%, 8.4%, 26.7%, 29.6%, 31% and 2.8% cases of prostatic adenocarcinoma in 40-49 years, 50-59 years, 60-69 years, 70-79 years, 80-89 years and ≥ 90 years age group respectively.

In our study mean age for BPH is 66.4 years, for BPH with prostatitis is 63.1 years, for chronic prostatitis is 65 years; median age of BPH , BPH with prostatitis, and chronic prostatitis is 65 years; minimum age for BPH is 45 years, for BPH with prostatitis is 40 years, for chronic prostatitis is 60 years; maximum age for BPH, BPH with prostatitis and chronic prostatitis are 86, 90 and 70 years respectively. Data are comparable to study of Badiya R et al [16].

In our study mean age for PIN is 70 years and for carcinoma mean age is 68.5 years; median age for PIN and adenocarcinoma is 70 years; minimum age for PIN is 55 years and for adenocarcinoma cases minimum age is 45 years. Maximum age for PIN and carcinoma is 85 years. Data are comparable to study of Wilfred DC et al [17].

Age distribution of Gleason score

In age group 40-49 years, 50% (1 case) of patient has Gleason score 6 and 50% (1 case) has Gleason score 8. In age group 60-69 years, 16.6% (1 case) of patient has Gleason score 5, 16.6% (1 case) has Gleason score 6, 66.7% (4 case) of patients have Gleason score 7 i.e. maximum number of patients in this age group have score 7. In age group 70-79 years, 40% (2 case) have Gleason score 6, 40% (2 case) have Gleason score 7, 20% (1 case) has Gleason score 8, patients of this age group have lowest Gleason score 6. In age group 80-89 years,

25% (1 case) has Gleason score 7 and 75% (3 cases) have Gleason score 8, so lowest Gleason score in this age group is 7. Maximum cases of Gleason score 8 (3 out of 5) are in age group 80-89 years. Study of Pepe P et al [18] also demonstrated significant correlation between Gleason score ≥8 and men older than 80 years of age. Thus our study shows progressive increase in Gleason score with age similar to studies ofDraisma G et al [19] and Pepe P et al [18].

Conclusion

Present study shows both benign and malignant lesions are more common in older age group mostly above 60 years of age, Though the minimum age of BPH and carcinoma both found to be 40-45 years. Also, as the Gleason score of prostatic adenocarcinomais higher in older age the severity of prostatic adenocarcinoma also seems to be higher for older age patients.

Limitations of study

As study was hospital based only patients seek medical care were included in study and also a small scale study so the result may not be the exact reflection of whole population.

Conflicts of interest: There is no conflicts of interest

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