_____

Detect Incidence of Prostate Carcinoma in TURP Chips Specimens and its Histopathological Diagnosis- A Retrospective Study, Andhra Pradesh

Suratha Sivajyothsna[1], Jada Srikanth[2]

[1]Assistant Professor, Department of Pathology, NRI Institute of Medical Sciences, Visakapatnam, Andhra Pradesh,India
[2]Assistant Professor, Department of Urology, NRI Institute of Medical Sciences, Visakapatnam, Andhra Pradesh,India

Abstract

Background: Benign prostatic hyperplasia is common condition in men over 50 years of age and shows remarkable racial and geographical variations in incidence and mortality. Inflammation, hyperplastic changes of prostate, and tumors are the commonest pathological processes that affect prostate gland. **Aim of the study:** To detectincidence of prostate carcinoma in Transurethral resection of the prostate (TURP) chips specimens and its histopathological diagnosis.**Methods:**This retrospective study done for duration of one year from January 2019 to December 2019. The TURP specimens were studied for histopathology.**Results:**In 45 cases of Benign prostatic hyperplasia (BPH) was most common diagnosis reported ie, about 60 % (27/45). BPH with chronic prostatitis was seen in 22.2 % (10/45) cases. Carcinoma prostate was seen in 20 % (09/45) cases. Out of these 04 belonged to T1a (25.8 %) and 05 belonged to T1b (74.2 %).**Conclusions:**Prostatic enlargement is common with increasing age and most often it is due to benign prostatic hyperplasia. In the present study, incidence of carcinoma prostate was 20 %. Gleason score 7 is the most common score encountered in prostatic adenocarcinoma. Prostatic carcinoma can often have serum PSA levels in the grey zone of 4 to 10 ng/ml.
Keywords: Benign Prostatic Hyperplasia, Carcinoma Prostate, TURP, Serum PSA.

Introduction

Prostate is a fibromusculoglandular organ encircling the neck of the urinary bladder. So, enlargement or growth of prostate due to nodular hyperplasia or prostatic intraepithelial neoplasia or adenocarcinoma may give rise to bladder outlet obstruction. Benign prostatic hyperplasia is an extremely common condition in men over the age of 50 years and shows remarkable racial and geographical variations in incidence and mortality[1].Inflammation, hyperplastic changes of prostate and tumors are the commonest pathological processes that affect prostate gland and are related to increasing age[2]. In the past, resected prostatic tissue was found to harbour previously unsuspected or occult malignancy in 10–31% of cases[3,4]. Although this concept is theoretically part of advising patients on informed consent for TURP, the literature has not clearly addressed the risk of finding stages T1a and T1b in the modern era. Furthermore, knowing whether individuals now treated with TURP alternatives face the same significant risk of occult PCa is critical when weighing the pros and risks of treating such men without submitting tissue for pathological analysis.Prostate cancer is a disease, of the prostate, a walnut-size, gland in the male reproductive system. Most common type of prostate cancer is prostatic adenocarcinoma, which arises from glandular elements and graded, based on its Gleason score, depends on the population of

the cells under the microscope and earlier it was given as ranging from two to ten. In 2014, the ISUP and World Health Organization adopted a simplified patient-centric grading system composed of 5 prognostic Grade Groups wherein grade group 1 corresponds to a Gleason score of 3+3=6 and grade group 5 corresponds to Gleason score of ≥ 9 or 10.[3]A low Gleason score, means that the cancer tissue is similar to normal cells (well-differentiated tumor) and unlikely to spread. A high Gleason score means that the cancer cells are very different from normal cells (poorly differentiated tumor) and are likely to spread[4].Prostate cancer and benign prostatic hyperplasia (BPH) are two major prostate diseases that increase with advancing aging. The incidence of both diseases is currently rising[5]. Prostate cancer is a common malignancy presenting clinically in 8 % of men. On autopsy, up to 60 % of 70-year-olds and 80 % of 80-year-olds are found to have latent prostate cancer[6].Clinical T1 or incidental prostate cancer is defined as clinically inapparenttumor that is neither palpable nor visible by imaging. Clinical T1a and T1b prostate cancer are diagnosed at the time of transurethral resection of the prostate (TURP) for benign prostatic disease. T1a disease involves 5 % or less of the resected tissue, whereas T1b disease involves more than 5 % of the resected tissue. Prior to the PSA era, up to 27 % of prostate cancers were detected incidentally at the time of TURP[7] With an increase in PSA screening, there has been a decrease in pT1a and pT1b lesions[8].

Aim of the Study
The aim of the study was to detectincidence of prostate carcinoma in Transurethral resection of the prostate (TURP) chips specimens and its histopathological diagnosis.

*Correspondence
Dr. Jada Srikanth
Assistant Professor, Department of Urology, NRI Institute of Medical Sciences, Visakapatnam, Andhra Pradesh,India
E-mail: drjadasrikanth111@gmail.com

_____

Sivajyothsna and Srikanth International Journal of Health and Clinical Research*, 2021; 4(13):250-254*
www.ijhcr.com

250

_____

Methods

This was a retrospective study carried out in the departments of Urology over a period of one year from January 2019 to December 2019 at NRI Institute of MedicalSciences,Visakapatnam,Andhra Pradesh.There were no ethical issues involved and ethical clearance obtained from Institutional Review Committee. Informed consent forms were obtained from all the patients included in the study. Patients attending the OPD department of Urology having signs and symptoms of prostatic enlargement were selected as per the inclusion criteria.

Inclusion Criteria

Patients willing to participate in the study

Patients aged 40-85 years or more.

All transurethral resection of prostate (TURP) specimens clinically diagnosed as benign prostatic hyperplasia (BPH)All patients with serum PSA level between 0ng/ml to 10ng/ml undergoing TURP.

Exclusion Criteria

Patients already diagnosed as carcinoma prostate.

Methodology

This was a retrospective study and a total of 45 cases were studied.

A questionnaire was prepared for collection of data that included age of the patient, history of present illness, past history, family history, personal history such as smoking and alcohol.

General examination was done. Digital rectal examination (DRE) findings were noted. Routine investigations were done like complete blood picture, random blood glucose, complete urine exam etc, Also serum PSA levels were done. Ultrasonography exam (USG) of prostate was done in all cases.

All patients were examined and evaluated.

All the patients included in the study underwent TURP resection.

All the TURP chips from the department of Urology / Operation theatre were immediately put into 10% buffered neutral formalin and sent to Pathology department for histopathological examination.

In the pathology department, the TURP chip specimen were received, they were weighed and were allowed to fix in formalin followed by taking of bits for processing.

Processing was done on automated tissue processor and stained with hematoxylin and eosin.

For diagnosis of carcinoma of prostate the guidelines set by the College of American Pathologists (CAP) were followed[.9]

Reporting and diagnosis of the Prostatic lesions were given by the concerned pathologist. Data was entered into excel sheet and percentages were calculated.

Sample size calculation

N=4PQ/d2

P=5.2%

Q=100-5.2(according to Varghese. J et al10)

d=7

N=. 4*5.2*94.8/49=41

Sample size is considered for 45

Data entry was done using M.S. Excel and it was statistically analysed using Statistical package for social science for M.S.Windows. Descriptive statistical analysis was carried out to explore the distribution of several categorical and quantitative variables. Categorical variables were summarized with n (%), while quantitative variables were summarized by mean±S.D. All results were also presented in tabular form and are also shown graphically using bar diagram or pie diagram as appropriate.

Results

Table 1: Age Distribution

There were a total of 45 cases with age ranging from 40 to 75 years.

Age in Years	No. of Cases	Percent (%)
40-45	02	4.4 %
46-50	05	11.1 %
51-60	08	17.7 %
61- 65	10	22.2 %
66-75	20	44.4 %
Total	45	100 %

In the present study age distribution ranged from 40 to 75 years. Majority of the patients were in the age group between 66-75 years. Mean age of presentation was 67 years.

Table 2: Distribution Related to Weight of Prostate

Weight of Prostate Chips	No. of Cases	Percent (%)
21-30 gm	03	6.6 %
31-40 gm	07	15.5 %
41-50 gm	10	22.2 %
> 50 gm	25	55.5 %
Total	45	100 %

In our study 55.5 % (25/45) had prostate weight above 50 grams. Mean prostate size was 54 gm.

Table 3: Distribution Related to Serum PSA Level

Serum PSA Levels	No. of Cases	Percent (%)
0-4 ng/dl	40	88.8 %
4-10 ng/dl	05	11.1 %
Total	45	100 %

In our study, majority of the patients had serum PSA levels between 0- 4 ng/dl
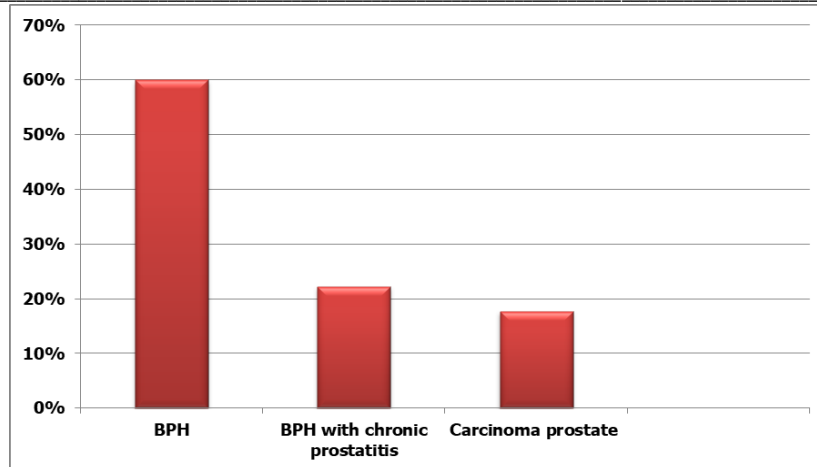
_____

Fig 1: Graph Depicting Histopathological Diagnosis

In the present, study benign prostatic hyperplasia was most common diagnosis reported ie, about 60 % (27/45 cases). BPH with chronic prostatitis was seen in 22.2 % (10/45 cases) and 20 % (09/45) were reported as Carcinoma prostate. Out of these, 04 (44.5%) belonged to T1a and 05 belonged to T1b (55.5 %)

Table 5: Gleasons Scoring

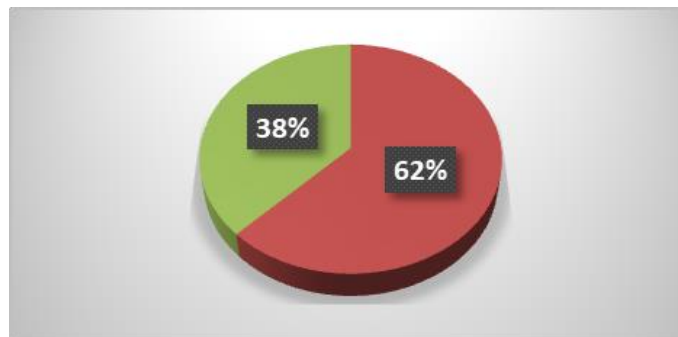| Gleasons scoring	No. of cases	Percent (%)
<6	-	-
7	05	55.5 %
>7	04	44.5 %
Total	09	100 %

Fig 2: Pie Diagram Showing Gleason Score

In the present study among 08 cases reported as Carcinoma Prostate, 05 cases were reported as moderately differentiated adenocarcinoma with Gleason score of 7(4+3) and 04 cases were of poorly differentiated adenocarcinoma with Gleason score of 9 (4+5).

Discussion

Although urologists understand that PCa discovered after TURP is a rare occurrence in today's world, the explanation for this finding has not been adequately investigated in the literature. It is clinically significant in two ways. First, during informed consent, patients should be informed about the possibility that cancer would be detected during pathologic evaluation of the resected specimen. This risk varies depending on whether or not the person has had a screening and/or biopsy. Patients who are exploring newer Benign prostatic hyperplasia (BPH) treatments that do not yield tissue for histological diagnosis are also at risk of undiagnosed malignancy. Medications or minimally invasive alternatives to TURP, such as microwave or laser therapy, are currently used to treat most men with obstructive symptoms. 6 The frequency of TURPs has declined considerably in the last two decades, owing to these alternatives' greater success. 7 Because T1a and T1b tumours are classified as those discovered during TURP, the decrease in the number of TURP procedures is significant.

According to some publications, the incidence of T1a and T1b cancer has dropped, but the chances of identifying the cancer at the time of a TURP may not have fallen as much throughout the PSA period. However, we expected that in the contemporary period, most men with occult PCa who would have previously fit stages T1a and T1b malignancies would be found before TURP with PSA screening. With these people eliminated from the pool of men without a known diagnosis of PCa who have TURP, it seems logical that the real percentage of men whose cancer is undetected until TURP should drop. The urological literature, contrary to our theory, has not conclusively supported this. The decline in the rate of T1a and T1b cancers was attributed to a decrease in the use of TURP, according to studies, and the incidence of occult malignancy identified as a percentage of men actually receiving TURP had not changed significantly. Analysed data from the Surveillance, Epidemiology,

and End Results (SEER) programme and concluded that TURP was responsible for much of the observed increase in overall PCa incidences between 1973 and 1986, including possibly all of it in men over the age of 70, and that the decrease in T1a and T1b after that was primarily due to decreased TURP use. The present study was done to determine the incidence of carcinoma prostate in TURP specimens and to look at the histopathological Gleason's grading in the carcinomas.

Comparative Studies Based on Age Distribution

In the present study,majority of the patients were in the age group between 66 -75 years ie, 44.4 % followed by 22.2 % among 61-65 years age. Mean age of presentation was 67 years.

Varghese et al[10] in a similar study observed the age of patients ranging from 41 to 90 years (Mean 66.79 ± 8.7 years). Thapaet al[11] in their study had a total of 103 patients with majority of patients (n=75, 72.8 %) who were 65 years or older.

Otto et al[12] in their study included 793men with age ranging from 45 to 90 years with a median of 71 years. Singh P et al[13] in their study had patients with age range of 45 to 75 years and most patients (n=141) presented in their 5th and 6th decade of life. Mean age of presentation was 64.07+_7.58 years. Shah et al[13] compared four ethnic groups in India and found that the free PSA levels correlated well with the patients'age but did not correlate well with the ethnicity. Gupta et al[14] also observed that healthy Indian men have lower age-specific serum PSA ranges compared to certain other populations of the world. They also confirmed that serum PSA correlates well with advancing ages

Comparative Studies Based on Serum PSA

In our study, majority of the patients were having serum PSA levels between 0- 4 ng/dl ie, 88.8 % cases. Only 11.1 % cases showed serum PSA levels between 4-10 ng/dl. Singh P et al[13] observed 31 patients (17.10 %) of the study population having PSA value between 4-10 ng/ml and 150 patients (82.90 %) of the study population having PSA value between 0-4ng/ml. Mean PSA value was 3.66+-2.68ng/ml. In the study done by Korti and Prabhalaet al[16] among the prostatic carcinoma cases, 16.6 % had serum PSA value in the grey zone of 4 to 10 ng/ml. This is similar to the findings of Malathiet al[17] where 20.8% cases of BPH had serum PSA value in the grey zone. Author reported >10 ng /ml PSA in 8.2% BPH cases. In our study 58.3% of patients of BPH had serum PSA level more than 10 ng /ml. Many patients with elevated PSA also had acute inflammation in the biopsies which could explain the rise in serum PSA. These patients were advised follow up PSA estimation. Whenever transient rise or fluctuating PSA levels are observed malignancy is unlikely[17]

Comparative Studies Based on USG of PROSTATE

In our study, 55.5 % (25/45) had prostate size above 50 gram. Mean prostate size was 54 gm. Singh P et al[13] in their study observed that most of the patients i.e. 83 (58.87 %) had prostate size between 51-80 grams. Mean prostate size was 59.71+-14.40 gm.

Comparative Studies Based on Histopathology

In the present study, benign prostatic hyperplasia (BPH) was the most common diagnosis reported ie, about 60 % (27/45). BPH with chronic prostatitis was seen in 22.2 % (10/45) cases. Carcinoma prostate was reported in 20 % (09/45) cases. Out of these 03 belonged to T1a (44.5 %) and 05 cases belonged to T1b (55.5 %). Otto et al[12] in their study reported that 760 (98.6 %) patients had benign prostatic hyperplasia or had inflammation on pathology. Prostate cancer was found in 11 (1.4 %) patients on histopathology. Of these 11 patients, 9 patients had T1a disease and 2 had T1b disease. Thapa et al[11] observed that 95 (92.2 %) patients were histologically diagnosed as having BPH. BPH with chronic prostatitis was seen in 45 cases and prostatic intraepithelial neoplasia was seen in one case. Other 2 cases had prostatic abscess and necrotic tissue respectively. Prostate cancer was seen in 05 (4.8 %) patients and all of them were above 65 years of age.

Comparative Studies Based on Incidence

In the present study, incidence of carcinoma prostate was 20 %. Varghese et al (10) reported incidence of occult carcinoma prostate in their study group as 5.2 % (31/597). Melchior and colleagues, the rate of incidental prostate cancer was found to be 5.4 % (104 of 1931 patients). In a study on 1648 patients undergoing surgery for BPH (1199 – TURP, 449 – open enucleation), Tombal and coworkers[7] found T1 prostate cancers in 11 % patients (182 of 1648). They concluded that the use of PSA assays have decreased but not suppressed the incidence of T1 prostate cancer, with a greater effect on those tumours at a higher risk of progression (T1b). Carcinomaof prostate is being diagnosed moreand more frequently in the urban Indian population as well[18]

In a Multi-Center review done in 11 centers in Korea by Yoo and coworkers,[19] incidental prostate cancer was detected in 4.8% (78 of 1613) of the patients who underwent surgical treatment for BPH and more than half of them showed clinically significant prostate cancer.

Lathika *et al*.[20] analyzed the time trends in the incidence of prostate cancer for different age groups of the Indian population reported in Indian cancer registries, using relative difference and regression approaches covering the various areas This revealed an increasing trend in the incidence of prostate cancer and the annual percentage change ranged 0.14-8.6.

Comparative Studies Based on Gleasons Grading and Score

In the present study, among 08 cases reported as Carcinoma Prostate, 05 cases were reported as moderately differentiated adenocarcinoma with Gleason score of 7 (4+3) and 03 cases as poorly differentiated adenocarcinoma with Gleason 9 (4+5).

Varghese et al[10] in their study observed that of all the patients detected with incidental prostatic carcinoma, 15 had a Gleason's score of 6/10, 6 had a score of 7/10 (4 with 3+4 and 2 with 4+3), 4 had score of 8/10 and 6 with score of 9/10.Otto et al[12] reported in their study that 10 patients had Gleason grade 3 + 3 = 6 disease and one patient had Gleason grade 3 + 4 = 7 disease. Singh P et al [13] observed in theiir study that out of 7 patients diagnosed as carcinoma prostate, 3 had Gleason's grade 6 and 4 had Gleason grade 7. Thapa et al[11] reported in their study that 02 cases had moderately differentiated adenocarcinoma with Gleason score of 7 and 03 had poorly differentiated adenocarcinoma with Gleason score >7. Korti and Prabhala et al[14] in their study reported a Gleason's score of 6 in 10 % patients. They observed that the most common Gleason score in their study was of 7 and was seen in 20 (66.6 %) patients.A Gleason's score of 6 was seen in 10% patients. The most common Gleason score reported in our study was of 7 and was seen in 20 (66.6%) patients. Ghagane et al(10) observed the most common score as ≥8 which was seen in 88.7% of their cases. They also found significant positive correlation between serum PSA level and Gleason score. Other authors have reported Gleason's score 7 as the commonest score in prostatic carcinoma. In a study by Bismar et al[21] observed 11% perineural infiltration in prostatic carcinoma in their study. Presence of perineural infiltration is considered a poor prognostic factor.More research is needed for prevention, early detection, and therapeutic choices for both patients and clinicians because prostatic illness is so frequent. The significance of stromal fragments with atrophic glands, ectatic blood vessels, and arteriosclerosis in BPH should be examined in a bigger study sample in the future. In our rural setting, only high-grade prostate carcinomas were found, implying that frequent screening could lead to earlier identification and improved patient care.

Conclusion

Prostatic enlargement is common with increasing age and most often it is due to benign prostatic hyperplasia. Chronic inflammation is a common finding in benign prostatic hyperplasia. In the present study, incidence of carcinoma prostate was 20 %. Gleason score 7 is the most common score encountered in prostatic adenocarcinoma. Prostatic carcinoma can often have serum PSA levels in the grey zone of 4 to 10 ng/ml.

_____

References
1. Kantikundo SNS, Bhattacharyya NK, Bhattacharyya PK, Kundu AK. A study to correlate histopathology, biochemical marker and immunohistochemical expression of sex-steroid receptor in prostatic growth. Indian J Med PaediatrOncol. 2014; 35(1):40-43.
2. Kumar V, Abbas, AK, Aster JC. Robbins and Cotran Pathologic basis of disease, (10th ed.), Philadelphia; PA: Elsevier/ Saunders. 2017; The male genital tract; page 994-999.
3. Epstein JI, Egevad L, Amin MB, Delahunt B, Srigley JR, Humphrey PA; Grading Committee. The 2014 International Society of Urological Pathology (ISUP) Consensus Conference on Gleason Grading of Prostatic Carcinoma: Definition of Grading Patterns and Proposal for a New Grading System. Am J SurgPathol. 2016;40(2):244-52.
4. Prostate Adenocarcinoma. The Cancer, Genome Atlas, National Cancer Institute, National Human Genome Research Institution, 2015.
5. Suzuki K. Epidemiology of Prostate Cancer and Benign Prostatic Hyperplasia. JMAJ. 2009; 52(6):478-483.
6. Bostwick D, Cheng L. Chapter 9: neoplasms of the prostate. In: Bostwick D, ed. Urologic surgical pathology. 2nd ed. Portland: Mosby Elsevier, 2008, 410e3.
7. Tombal B, de Visccher L, Cosyns J. Assessing the risk of unsuspected prostate cancer in patients with benign prostatic hypertrophy: a 13-year retrospective study of the incidence and natural history of T1a-T1b prostate cancers. BJU International. 1999;84(9):1015-1020.
8. Fowler Jr. JE, Pandey P, Bigler SA, Yee DT, Kolski JM. Trends in diagnosis of stage T1a-b prostate cancer. Journal of Urology. 1997;158(5):1849-1852.
9. Srigley JR, Humphrey PA, Amin MB, Chang SS, Egevad L, Epstein JI et al. Protocol for the examination of specimens from patients with carcinoma of the prostate gland. Archives of Pathology and Laboratory Medicine. 2009;133(10):1568-1576.
10. Varghese J, Kuruvilla PM, Mehta N, Rathore RS, Babu M, Bansal D et al. Incidentally Detected Adenocarcinoma Prostate in Transurethral Resection of Prostate Specimens: a Hospital Based Study from India. Asian Pac J Cancer Prev. 2016;17(4): 2255-8.
11. Thapa N, Shris S, Pokharel N, Tambay YG, Kher YM, Acharya S. Incidence of Carcinoma Prostate in Transurethral Resection Specimen in a Teaching Hospital of Nepal.J. Lumbini. Med. Coll. 2016;4:77-79.
12. Otto B, Barbieri C, Lee R, Te AE, Kaplan SA, Robinson B et al. Clinical Study-Incidental Prostate Cancer in Transurethral Resection of the Prostate Specimens in the Modern Era. Advances in Urology. 2014; Article ID 627290:1-4.
13. Shah S, Jha B, Khanal MP. Effects of aging and ethinicity on serum free prostate specific antigen. Asian Pac J Cancer Prev. 2011;12:2509–12.
14. Hebert JR, Ghumare SS, Gupta PC. Stage at diagnosis and relative differences in breast and prostate cancer incidence in India: Comparison with the United States. Asian Pac J Cancer Prev. 2006;7:547–55
15. Singh P, VijayKumar, Jain A, Singh G, Saroj AK, Karuna V. Incidental prostate cancer in transurethral resection of the prostate (TURP) specimens having intermediate serum prostate-specific antigen (PSA) level. Int. J. Adv. Res. 7(3):549-553.
16. Korti P, Prabhala S, Erkambbattu J, Deshpande AK. Study of transrectal ultrasound guided biopsies of prostate in correlation with serum prostate specific antigen level. IJPO. 2017;4(4): 604-610.
17. Malati T, Kumari RG. Racial and ethnic variation of PSA in global population: Age specific reference intervals for serum prostate specific antigen in healthy south Indian males. Indian J Clin Biochem. 2004;19:132–7.
18. Hariharan K,Padmanabha V.Demography and disease characteristics of prostate cancer in India. Indian J Urol. 2016; 32(2): 103-108.
19. Yoo, Changhee& Kim, Se & Kim, Sun Il& Kim, Young Sig & Park, Jong &Seong, Do & Song, Yun & Yang, Won Jae & Chung, Hyun & Cho, In & Cho, Sung Yong &Cheon, Sang-Hyeon& Hong, Sungjoon& Cho, Jin. Preoperative Clinical Factors for Diagnosis of Incidental Prostate Cancer in the Era of Tissue-Ablative Surgery for Benign Prostatic Hyperplasia: A Korean Multi-Center Review. Korean journal of urology. 2012; 53:391-5.
20. Lalitha K, Suman G, Pruthvish S, Mathew A, Murthy NS. Estimation of time trends of incidence of Prostate Cancer-an Indian scenario. Asian Pac J Cancer Prev. 2012; 13:6245-50.
21. Bismar TA, Lewis JS Jr, Vollmer RT, Humphrey PA. Multiple measures of carcinoma extent versus perineural invasion in prostate biopsy tissue in prediction of pathologic stage in a screening population. Am J SurgPathol. 2002; 27:432–440.

_____