ORIGINAL RESEARCH PAPER

Volume-8 | Issue-4 | April-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

A CORRELATIVE STUDY OF THE EFFICACY OF SERUM PROSTATE SPECIFIC ANTIGEN AND TRANSRECTAL FINE NEEDLE ASPIRATION CYTOLOGY IN THE EARLY DIAGNOSIS OF PROSTATE GROWTH

Pathology

Dr. Adity Sharma Professor, Department of Pathology, Assam Medical College and Hospital, Dibrugarh, Assam, India

Dr. Alankrita Deka* PGT, Department of Pathology, Assam Medical College and Hospital, Dibrugarh, Assam, India *Corresponding Author

ABSTRACT

INTRODUCTION: The incidence of prostate cancer is on rise. It is fatal once it has spread outside the prostate. Therefore, it is important for early diagnosis of cases with prostatic enlargements and detect organ confined prostatic cancer.

AIM: To study the efficacy of serum PSA and transrectal FNAC in the early diagnosis of prostatic growth.

RESULTS AND OBSERVATION: FNAC showed 36 BPH, 04 prostatitis and 12 adenocarcinoma cases. sPSA level was found to be high in both benign and malignant cases. The sensitivity and specificity of the serum PSA found to be 100% and 85% respectively with a predictive value of 67%.

CONCLUSION: Transrectal FNAC is a simple and safe procedure with high specificity & can be combined with sPSA estimation as a complementary investigative procedure.

KEYWORDS

PSA- Prostate specific antigen, FNAC – Fine needle aspiration cytology, BPH – benign prostatic hyperplasia.

INTRODUCTION

Growth of the prostate is a very prevalent and significant public health concern in older male past 50 years [1]. It often presents with the chronic and agonizing obstructive urinary symptoms. Various pathological processes affecting the prostate manifest as nodular enlargement, of which most significant is prostatic carcinoma. Incidence of prostatic cancer is on rise, mostly due to better investigations. The incidence is very high among African American compared to Asian[2]. In India the reported incidence is around 4% as per National Cancer Registry. [3]

Prostate cancer mortality increases once it spread outside prostate, hence much thought has been give to the screening modalities. This led to the introduction of Prostate specific antigen as the first serum test. Although PSA is organ specific and single best serum test available but it is not disease specific and can give high false positive result. PSA can be combined with FNAC study to improve specificity of prostate cancer and aid in better and early diagnosis[4,5].

AIM

To study the efficacy of serum prostate specific antigen and transrectal fine needle aspiration cytology in the early diagnosis of prostatic growth.

MATERIAL AND METHOD

The study was conducted in AMCH, on 52 patients diagnosed clinically with prostatic enlargement. The patients selected for the study were those presenting with urinary symptoms, any suspicious nodule in the posterior lobe of the gland or known case of prostate cancer presenting with obstructive symptoms.

Digital rectal examination was done followed by transrectal FNA, using Franzen's needle. It consist of a guide and a needle of 22 gauge. The index finger is inserted in the ring of the Franzen's guide and gently inserted in the rectum. A 20 ml disposable syringe is attached to the needle and inserted into the guide slowly. Smears were made from the aspirate and stained with M.G.G. and PAP stain.

A blood sample was taken for serum PSA estimation. The PSA is quantatively estimated by enzyme immunoassay and results are expressed in ng/ml.

RESULTS AND OBSERVATION

The study was carried out in 52 patients ranging from 42 to 92 years. Maximum cases were in between 61-70 years (32.6%).

The maximum number of benign cases (42.4%) were in the age group of 61-70 years. And the incidence of malignant cases increases with the age of the patient.

TABLE 1: Clinical features of the patients

Symptoms	No. of cases	Percentage
Dysuria	23	44.2%
Dysuria + urinary retention	20	38.4%
Dysuria + Hematuria	04	7.6%
Urinary retention + Hematuria	05	9.6%
Total	52	100%

TABLE 2: Number of cases detected as benign and malignant based on s PSA level with 4ng/ml as cut-off.

Diagnosis	No. of cases
Benign	18
Malignant	34

TABLE 3: Diagnosis based on cytological findings

Diagnosis	No. of cases
BPH	36
Prostatitis	04
Adenocarcinoma	12

Table 4: Distribution of s PSA in different types of prostatic tumours

Prostatic tumour	Aupto 10 ng/ ml	B> 10-20 ng/ ml	C>20- 50 ng/ ml	D>50 ng/ ml	Total no.
BPH	22	14	00	00	36(69.2%)
Prostatitis	04	00	00	00	04(7.6%)
Adenocarcinoma	02	02	07	01	12(23%)

Table 5: Distribution of s PSA in different grades of prostatic carcinoma

Adenocarcinoma	A upto 10 ng/ ml	B> 10-20 ng/ ml	C>20- 50 ng/ ml	D>50 ng/ ml	Total no.
Well differentiated	02	01	00	00	03(25%)
Moderately differentiated	00	01	06	00	07(58.3%)
Poorly differentiated	00	00	01	01	02(16.66%)

Malignant cases showed wide variation in the serum PSA level. The level of s PSA shows direct correlation with the grade of the malignant tumour.

Table 6: Correlation of s PSA findings and cytological diagnosis

Serum PSA findings (cut – off 4ng/ml)	No. of cases	Cytopathological diagnosis		
		BPH	Prostatitis	Adenocarcinoma
Benign	18	15	03	00
Malignant	34	21	01	12

Table 7: Sensitivity, specificity and predictive value of serum PSA

Serum PSA findings	Prostate cancer present	Prostate cancer absent
Cancer	12(TP)	06(FP)
No cancer	00(FN)	34(TN)

Sensitivity = TP/TP + FN x 100 = 12/12 + 00 x 100 = 100%
Specificity = TN/TN + FP x 100 = 34/34 + 06 x 100 = 85%
Predictive value = TP/TP + FP x 100 = 12/12 + 06 x 100 = 67%

DISCUSSION

Since 1980s PSA has been used as a screening test and useful biological marker to monitor prostate cancer[6,7].

Table 8: Percentage of cancer found in various studies based on s PSA level cut-off of 4ng/ml

Author	No. of cases	% of cases
Catalona et al.[8]	160	71
Ohori et al.[9]	306	71
Scaletsky et al.[10]	142	73
Present study	52	67

Table 9: PPV of PSA level in different studies

Studies	PPV
Basinet et al.[11]	37
Brawer et al.[12]	31
Rommel et al.[13]	41
Present study	67

The primary pitfall of PSA screening is the risk of raised PSA level in benign condition. All the screening modalities have several limitations. Thus, combination of tests seems to be an appropriate screening method.

Transrectal FNAC is an easy, simple outpatient procedure with no complication. The only complication was burning sensation after the procedure which subsisded within one hour. Prostate carcinoma is most common in posterior lobe and by transrectal route it is easily accessible. It may also occur in lateral lobe which is also accessible by transrectal route, thus it proves to be the best route for taking FNAC. Hence it can be combined with s PSA estimation as a complementary investigation in diagnosis of early prostatic growth.

Using Franzen's needle sufficient material was obtained in all the cases (100%). It is in accordance to other studies conducted by Jayaram et al., De Gaetani & Trentini et al[14,15].

Table 10: Incidence of benign or malignant lesion by FNAC study

Studies	Benign	Malignant
Singh et al.[16]	77%	23%
Jayaram et al.[14]	81.8%	18.1%
Aryya et al.[17]	93%	7%
Present	76%	23%

In the present study cytological correlation was done in all the 52 cases with s PSA findings. It showed no false negative cases, 34 true negative cases, 12 true positive cases and 06 false positive cases.

Because of the high false positivity of serum PSA and the limited predictive value a considerable number of people will be subjected to unnecessary biopsies. However, transrectal FNAC being safe, fast and easy outpatient procedure with high sensitivity and specificity can be complemented with serum PSA estimation. Thus, decreasing the number of false positive cases and the predictive value rises to 100%.

CONCLUSION

Thus we can conclude that prostate specific antigen is an exquisitely sensitive marker and reflects the tumour status of the patient. However, it is not prostate cancer specific. Significant rise in serum PSA level are also associated with various benign condition of the prostate gland. Hence, if it is combined with transrectal fine needle aspiration cytology, it will become a important part of early detection programme which will enhance early and definitive treatment.

REFERENCES

1. Badenoch A. Benign enlargement of the prostate. Trans Med Soc Lond 1970,86:34-40.
2. W.H.O. Classificationof tumours. Tumours of the Urinary System and Male genital organ. 2004.
3. National Cancer Registry Programme of ICMR.
4. Franzen S; Giertz G; Zajicek J. Cytological diagnosis of prostatic tumours by transrectal aspiration biopsy. A preliminary report. Br.J. Urol. Vol. 32,193-195.
5. Esposti P.L. Cytological malignancy grading of prostatic carcinoma by transrectal aspiration biopsy.1971. Scand. J. Urol. Nephrol. Vol 199-209.
6. Catalona WJ et al. Measurement of PSA in serum as a screening test for prostate cancer. N Engl J Med 324: 1156 – 1156, 1991.
7. TA Stamey et al. Prostate specific antigen as a serum marker for adenocarcinoma of the prostate. N Engl J Med 319:909-916,1987.
8. WJ Catalona et al. Comparison of digital rectal examination and serum prostate specific antigen in the early detection of prostate cancer: J Urol 151:1283-1290, 1994.
9. MW Plawker et al. Current trends in prostate cancer diagnosis and staging among US urologists. J Urol 158(5): 1859-1860, 1997.
10. R Scaletsky et al. Tumour volume and stage in carcinoma of prostate detected by evaluation in PSA. J Urol 152: 129-131.1994.
11. Bazinet M et al. Prospective evaluation of PSA density and systemic biopsies for early detection of prostate carcinoma. Urology 43:4-51.
12. Brawer MK et al. Screening of prostate cancer with prostate specific antigen. J Urol 147:841-845.
13. Rommel FM et al. The use of PSA and PSAD in the diagnosis of prostate cancer in community based urological practice. J Urol 151: 88-93.
14. Jayaram G et al. Transrectal fine needle aspiration of prostate. J. Assoc. Physicians – India, 1993. June; 41(6): 364-6.
15. De Gaetani et al. Atypical hyperplasia of the prostate. A pitfall in cytological diagnosis of carcinoma.
16. Singh N, Shenoi UD, Raghuveer CV. FNAC and Trans abdominal ultrasonography in the diagnosis of prostatomegaly. Ind. J. Pathol. Microbiol. 40(4).473-479.
17. Aryya NC et al. Fine needle aspiration cytology in the diagnosis of prostate enlargement. J. Cancer 29:1992; 186-191.