Prevalence of PSA in suspected cases at TUTH

Bharat Jha*

Chitra Kumar Gurung**

Dr. Parashuram Mishra***

Pushpa Bist****

Abstract

Blood samples of suspected cases of prostate carcinoma were analysed by Enzyme Immunoassay. The objective of this study was to find out the percentage of PSA positivity in under or above 50 years of age. We found that positivity percentage was higher in under or 50 years age group.

Keywords: PSA; BHP; Carcinoma prostate; TNM staging.

Introduction

PSA (Prostate-specific Antigen) is a Glycoprotein 30 to 40 KDa, specific for prostatic epithelium. Its function maybe to facilitate liquefaction of semen but it is a marker for prostate disease. Its normal upper limit is about 4 nano gram/ml. Its level in men with metastatic prostatic cancer is usually increased to more than 30 nano gram/ml & falls to low levels after successful androgen ablation. Men with locally confined prostate cancer have serum PSA level to about 15 nano gram/ml or lower. A diagnosis of early prostate cancer under 60 yrs. of age might be offered radical treatment - should be a PSA measurement. If this is in excess of 4 nano gram/ml, then transrectal ultrasonography plus multiple transrectal biopsies should be considered. Nevertheless, the finding of PSA over 10 nano gram/ml is suggestive of cancer & over 35 nano gram/ml is diagnostic of advanced prostate cancer.[1] It is present in the blood and in seminal fluid[2,3] like prostatic acid phosphatage; its level in the blood is about doubled if the prostate is massaged. It also tends to increase in prostatic hypertrophy. PSA is the most sensitive marker for the progression of prostatic cancer and its response to therapy. It also appears to be more sensitive and a better indicator of tumour burden than prostatic acid phosphatase. Hence it has been used as the screening for prostate carcinoma.[4] However, it cannot be used by itself for diagnosis or screening because modest elevation is observed in patients with benign prostatic hypertrophy.

Human prostate specific Antigen
was purified by Hans Lija *et al*.[5] Serum PSA was measured quantitatively by sensitive Enzyme Immunoassay by Kuriyama wang mc.[6] In our study we used enzyme immunological test for the quantitative determination of PSA which has the test principle of sandwich assay using streptavidin technology.

Materials and method

(a) Spectrophotometer Hitachi 100-10

(b) Auto Pipette -

1000 micro Litre Bioscience

50 micro Litre Bioscience

(c) Vortex Mixer - Edey - Advantec model TME - 21

(d) Kit - Enzyme Immuno test for the quantitative determination of prostatic specific Antigen (PSA), Boehringer Mahnheim Immunodiagnostics.

Procedure

Fifty micro Litre of Standard/Control/ Serum/Samples were taken in a streptavidin tubes. 1.0 ml of solution 1a (Incubation buffer and Anti PSA-POD conjugate in
ratio of 100:1 were mixed) was added. Incubated for 90 minutes at room temperature. Then it was washed three times with distilled water. Thereafter, 1.0 ml of substrate chromogen solution was
added and further incubated for 30
minutes. Reading of sample, control
and standard were taken against blank at
420 nm.

Results

Table I: Distribution of patients according to age group and PSA at <4.0 nano gram/ml at cut off Point.

Age group	*PSA*		*Total*
	<4.0 nano gram/ml	*>4.0 nano gram/ml*	
Up to 50 years	1 (25.0)	3 (75.0)	4 (4.9)
Above 50 years	26 (37.6)	43 (62.5)	69 (85.2)
Not available	0	8 (100.0)	8 (9.9)
Total	27 (33.3)	54 (66.7)	81 (100)

Table II: Distribution of patients according to age group and PSA at <10.0 nano gram/ml at cut off Point.

Age	*PSA*		*Total*
group	*<10.0 nano gram/ml*	*>10.0 nano gram/ml*	
Up to 60 years	2 (50.0)	2 (50.0)	4 (4.91)
Above 50 years	52 (75.4)	17 (24.6)	69 (85.2)
Un-specified	5 (62.5)	3 (37.5)	8 (9.9)
Total	59 (72.8)	22 (27.2)	81 (100.0)

(P=0.4255)

Discussion

In our study 43 out of 69 cases were positive of the population more than 50 years of age, and only 3 positive cases of age less than 50 years of age (Table I). So far as specificity is concerned at a cut-off point of 4 nano gram per ml, PSA is 99% in men aged less than 40 years of age and 97% in men more than 40 years of age. A 4 nano gram/ml cut-off PSA has a sensitivity of 67% for stage 1 prostatic carcinoma rising progressively to 88% for stage IV disease. This figure reduces to 30% and 66% respectively at cut-off 10 nano gram/ml.[7]

Staging according to TNM (Also shown in schematic representation of present TNM system)

Schematic Representation of the Present TNM System

T_o - Carcinoma-in-situ.

T_{1a} & T_{1b} are incidentally found tumours in clinically benign gland after histological examination of a prostactectomy specimen.

T_{1a} is a well or moderately well differentiated tumour involving less than 5% of the resected specimen. T_{1b} is a poorly differentiated tumour or a tumour involving over 5% of the resected specimen.

T_{2a} is a suspicious nodule on rectal examination of less than 2 cm.

T_{2b} is a nodule involving greater than 2 cm.

T_{2c} is a tumour in both lobes but still clinically confined.

T_3 involving the seminal vesicles or bladder neck.

T_4 involves rectum or pelvic side wall.[8]

Since we were interested in the study on prevelance of PSA in the suspected cases only, we did not follow the above mentioned present TNM system. However, in our study age group more than 50 years positivity is only 62.4% and less than 50 years of age group is 75%. But taking the cut-off point more than 10 nano gram/ml positivity in age group above 50 years is 24.6% and below 50 of age group is 50%.

Conclusion

PSA is more sensitive and better marker for age group below 50 years of age. But can be used as a screening marker of all the age (above 50 years of age) and also for the prognosis of prostatic carcinoma. In depth, the study is suggested to find the sensitivity of PSA in the Nepalese population.

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