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PREVALENCE OF PROSTATE SPECIFIC ANTIGEN (PSA) CONCENTRATION AMONG MALE LECTURERS AT COLLEGE OF SCIENCE/ UNIVERSITY OF AL-MUSTANSIRIYA /BAGHDAD /IRAQ

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ABSTRACT

In attempt to urge men of age 40 years and older to investigate concentration of Prostate Specific Antigen (PSA) in their blood as a periodically checking for pre-screening of prostate cancer as recommended by many medical organizations and associations around the world, 60 blood samples were collected from lecturers and professors in faculty of science at the University of AL-Mustansiriya to investigate the concentration of PSA in their sera by using ELISA technique. Sixteen of the whole group study (26.6%) were positive to PSA with concentration above 4 ng/ml as the producing company determined and they all were recommended to council a physician. The results were distributed against age, ABO system and smoking by asking volunteers to full a questioner.

KEY WORDS: Prostate Specific Antigen, age, smoking, ABO blood group.

INTRODUCTION

Human prostate specific antigen (PSA) is a serine protease, a single chain glycoprotein with a molecular weight of approximately 34,000 Daltons containing 7% carbohydrate by weight. PSA is immunologically specific for prostate tissue; it is functionally and immunologically different from prostatic acid phosphatase.[1] After the publication of reports on several series in which the need for a biopsy of the prostate was based on the results of PSA tests, the potential of the PSA level as a screening tool was recognized.[2,3]

The PSA test measures the level of prostate specific antigen in the blood. Its measurement in the blood can be used to detect disease. It's sometimes called a biological marker or tumor

marker because PSA elevation is not associated with healthy men or is it present in any other tissue obtained from man.[4] Further experience led to the consensus that a PSA level of more than 4.0 ng per milliliter had predictive value for the diagnosis of prostate cancer.[5] Disease detection subsequently increased dramatically.[6] More recent data suggest that a PSA level of more than 2.5 ng per milliliter has a predictive value similar to that of a value of 4.0 ng per milliliter or greater.[7, 8] It has been speculated that prostate-specific antigen (PSA) screening, introduced into North American medical practice by the end of the 1980s, may be responsible for this decline in mortality.[9,10] However, many physicians and scientists consider that even if PSA screening was effective in preventing or postponing death from prostate cancer, it is too early to observe such an effect.

In this research we are trying to spread awareness of The importance of performing PSA test periodically to avoid late stages of prostate cancer and subsequently death.

SUBJECTS AND METHODS

Subjects

The study included 60 male volunteers with an age ranging between (40-65) years, these subjects were professors and lecturers at college of science / university of AL-Mustansiriya. A control group of 10 young male with an age ranging between (20-30) years were included in the study, and they were students at the same college. Both subjects and control groups answered a detailed questionnaire to obtain sociodemographic data such as age, sex, smoking habits, blood group and drug treatment.

Samples collection

Five milliliters (5ml) venous blood was obtained from both subject and control groups.

All blood samples were dispensed into dry glass test tubes for clotting and retraction to take place. Sera were obtained after samples were centrifuged at 2000g for five minutes and stored at -20°C until assayed for laboratory investigations.

PSA Estimation by ELISA

Stored frozen sera samples were retrieved, thawed, and tested for PSA by means of a quantitative enzyme immunoassay using a commercial kit (BioCheck /USA). The PSA ELISA test is based on the principle of a solid phase enzyme-linked immunosorbent assay. The assay system utilizes goat anti-PSA antibody directed against PSA for solid phase immobilization (on the microtiter wells). A cut off PSA titer of 4 was used to classify

subjects as positive or negative, as recommended by the manufacturer. Reference standards were used to produce a standard curve to quantitate PSA levels in volunteers' and control samples. The results were expressed in Nano gram per milliliter. The normal value for PSA was up to 4 ng/ml.

Statistical analysis

All statistical analyses were performed with Statistical Mini-tab software. Data were analyzed for mean and standard deviation. Proportions were expressed as percentage.

RESULTS AND DISSCUSION

Table-1 shows the demographic, lifestyle and clinical characteristics of the subjects. Seropositive PSA was detected in 26.6% of participants (16/60), while Table -2 shows the relationship between the demographic, lifestyle, and PSA positivity in which most PSA positivity was detected in men with age range (40-49), normal BMI, non- smokers and O blood group as shown in Table 2.

Table (1): Subjects' demographic, lifestyle, and clinical data.

	No. (%)*
Age 40-49 50-59 60-69	 31 (51.6%) 17 (28.3%) 12 (20%)
Currently Smoking Yes No	 17(28.3%) 43(71.7%)
Family history of prostate cancer Yes No	 1(1.66%) 59 (98.34%)
Body Mass Index Underweight Normal Overweight Obese	 0 (0%) 53(88.33%) 5(8.33%) 2(3.33%)
ABO system A B AB O	 11(18.33%) 15(25%) 4(6.66%) 30(5%)
Urinary tracts infection UTI Yes No	 7(11.66%) 53(88.34%)

Seropositive of PSA Yes No	 16(26.66%) 44(73.34%)

*** Values are numbers (percentage) of subjects.**

Table (2): The relation between PSA and demographic, lifestyle.

	Positive PSA	Negative PSA
Age 40-49 50-59 60-69	 9(56.25%) 3(18.75%) 4(25%)	 22 (51.16%) 14(32.55%) 8(18.60%)s
Currently Smoking Yes No	 4(25%) 12(75%)	 12(27.27%) 32(72.72%)
Family history of prostate cancer Yes No	 1(6.25%) 15(93.75%)	 0(0%) 44(100%)
Body Mass Index Underweight Normal Overweight Obese	 0(0%) 16(100%) 0(0%) 0(0%)	 0(0%) 37(84.09%) 5(11.36%) 2(4.54%)
ABO system A B AB O	 4(25%) 4(25%) 1(6.25%) 7(43.75%)	 7(15.90%) 11(25%) 3(6.81%) 23(52.27%)
Urinary tracts infection UTI Yes No	 2(12.5%) 14(87.5%)	 5(11.36%) 39(88.63)%

One of the interesting results we have got is the negative relationship between smoking as a major risk factors for many cancers and PSA positivity of our volunteers. As shown in Table-3, only 4 of the 17 volunteers with positive PSA were cigarette smokers. This result is very on the contrary of many studies which informed the high PSA concentration is very related to smokers than non-smokers,[11, 12, 13] this may be due to the Small sample size that we had.

Table (3): represent the ratio of negative and positive between smokers and non-smokers

Sample No=60 (100%)	Smoker=17(28.3%)	Mean± SE	Nonsmoker=43(71.7%)	Mean± SE
Positive PSA	4(23.5%)	21.2± 13.3	12(27.9%)	17.49± 6.04
Negative PSA	13(76.5%)	2.72± 0.25	28(72.1%)	2.35± 0.15

A common pattern on the distribution of blood types among the population study is seen in Table (4) which shows that the ABO phenotypes were as follows: 12.3%7 %, 7% and 1.8% for positive PSA and for negative PSA were31.6%19.3 %, 15.8% and 5.3% for each of O, B, A and AB blood groups respectively, the pattern observed was O>B>A>AB. In which, blood type O is most prominent, followed by blood type B, blood type A, then the least common blood type AB.

Table (4) Percentage distribution of ABO blood group in study population

Blood Group	Positive PSA	Negative PSA
A	4(7%)	7(15.9%)
B	4(7%)	11(25%)
AB	1(1.8%)	3(6.81%)
O	7(12.3%)	23(52.27%)

After the introduction of PSA as a screening test, the detection r ate of prostate cancer in early stages has considerably increased. Until recently, PSA levels of 4.0 ng/mL have been used as the threshold to undergo prostate biopsy. Then some authors indicated that similar detection rates could bea chieved with PSA levels of 2.5 to 4.0 ng/mL and 4.0 to 10.0 ng/mL, thus they suggested using 2.5 to 4.0 ng/mL as the lower PSA limits to undergo prostate biopsy.[14, 15] But since PSA is not cancer-specific; PSA is influenced by various factors and because of complications, such as infection and hematuria, unnecessary biopsies should be avoided where possible.

The optimal upper limit of the normal range for prostate-specific antigen (PSA) is unknown. Age-specific prostate specific antigen (PSA) cutoffs for prostate test have been widely used in the countries. However, the application of age-specific PSA remains poorly understood in Iraq.

Our results may help to investigate the sensitivity and specificity of PSA measurements in the diagnosis of prostate cancer in Iraq, and many studies needed to be done to determine age-

specific prostate-specific antigen (PSA) reference values in a community-based sample of Iraqi men, with different ages beyond 40 years.

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