Quest Journals
Journal of Medical and Dental Science Research
Volume 4~ Issue 5 (2017) pp: 36-42
ISSN(Online) : 2394-076X ISSN (Print):2394-0751
www.questjournals.org

Research Paper

Prostate Screening Among Doctors in Aba, South Eastern Nigeria

.

*Uche CL[1], Alaje AK[2], Chikezie J[3], Abali [4], Ubani-Ukoma C[3]
[1]*Department of Haematology Abia state University Teaching Hospital Aba*
[2]*Depatment of Chemical Pathology Obafemi Awolowo University Ile-Ife Osun State*
[3]*Department of Internal Medicine Abia state University Teaching Hospital Aba*
[4]*Department of Surgery Abia state University Teaching Hospital Aba*
Corresponding author: Uche CL

Received 21dec, 2017; **A**ccepted 06dec, 2018 © The author(s) 2017. **P**ublished with open access at **www.questjournals.org**

Abstract : *Screening tests are important part of preventive health care. They are used to identify people with increased risk for a condition before they have symptoms. Previous study done on these group of people showed that the subjects have a good knowledge but their practice and attitude toward PSA screening are poor, hence, the need for this study.The aim of this study is to assess the level of prostate specific antigen (PSA) of practicing male doctors from 40years of age and above, aiming at determining those at risk of having prostatic diseases. This is a cross- sectional descriptive study done during Nigerian Medical Association monthly meeting. Those who were absent at the meeting were seen in their different clinics at Aba. A structured questionnaire was administered to sixty-one censented male doctors in order to obtain information on demographic parameters, past medical history and some factors that can influence PSA result. Body mass index (BMI) was calculated using height and weight of the subjects, and blood pressure measured. About 5 milliliter (ml) of venous blood was collected into a plain bottle. Specimens were allowed to clot and serum harvested after centrifugation. The serum samples were assayed for PSA using ELISA method. Data were analyzed using SPSS version 20.Mean and standard deviation was computed for quantitative variables. Pearson chi- square was used to test for association between qualitative variables, P <0.05 was statistically significant. The mean age and PSA of the respondents were 54.1±7.8years and 4.79±4.9ng/ml respectively. Thirty-three (54.1%) subjects had PSA of less than 4ng/ml (mean = 1.99± 0.8ng/mL) 23 (37.7%) had equivocal values (5.94±1.3ng/ml) while only 5(8.2%) had an elevated PSA level (18.8±5.8ng/ml).No Significant association was observed between PSA values and pre-analytical factors such as recent sexual intercourse,recent cycling and recent catheterization (p >0.05) This study showed that 8.2% of the respondents had an elevated PSA level which may be suggestive of a prostate disease. Therefore, there may be an attending risk for developing prostate disease among male doctors.*

Keywords*: psa, prostate, screening, doctors*

I. INTRODUCTION

Prostate cancer is a major cause of cancer related deaths worldwide[1] and the most prevalent cancer in men in Nigeria[2]. A high incidence rate of prostate cancer was documented to be between 117/100,000 and 127/100000men in Nigeria[3,4].Two methods are widely used for prostate cancer screening, which include prostate specific antigen (PSA) and digital rectal examination (DRE) with sensitivities of 72.1% and 53.2% respectively. However, the clinical sensitivity of PSA improves when these methods are combined[5].

Prostate specific antigen is widely accepted for screening male population for early detection of CA prostate of which many developed countries have developed guidelines for its recommended use.Elevations of serum PSA above 4ng/ml is suggestive of CAP although this cut-off may cause unnecessary biopsies for those individuals in the intermediate (4-10ng/ml) range[6]. This may also lead to over diagnosis of prostate disease. It is therefore necessary to apply caution in interpreting PSA results. Several modalities have been proposed in the use of PSA to improve its clinical sensitivity and avoid un-necessary diagnosis. They include the use of age adjusted reference interval to interpret PSA results based on categorization of individuals into different age group[7]. Those men 40 – 49 years are expected to have PSA level of 0-2.5ng/ml, 50 – 59years to have 0 – 3.5ng/ml, 60 -69years to have 0- 4.5ng/ml and those 70 – 79years expected to have PSA 0- 6.5 ng/ml. the age adjusted reference will increase the cancer detection in younger men for whom potential cure by radical prostatectomy is most beneficial. Although, there's a risk of missing clinically significant tumor in older men. The use of PSA velocity

which monitors the rate of Prostate specific antigen increase as a function of timeutilizing at least two PSA result over 18month period is another approach. A value greater than 0.75ng/ml year is observed in patients with prostate cancer.The most successful approach is the use of percent free PSA (free PSA/ total PSA multiplied by 100). It is most useful for those patients in the gray zone (4-10ng/ml). Men with prostate cancer have low free PSA and a more bound PSA[8].Some have also improved the sensitivity of PSA by combining it with trans-rectal USS to derive PSA density. This is most useful in men with benign prostatic hypertrophy (BPH). A combination of PSA with digital rectal examination (DRE) also improves the sensitivity of PSA from 72.1% to 87.2% [5].

The level of awareness of prostate cancer in Nigeria is low and the voluntary PSA screening is low in the general population compared to the high incidence of the disease[9]. Despite many approaches to the use of PSA, they are some pre-analytical variables which may affect PSA result and its sensitivity. Thus, over-diagnosis or pseudo-disease state is likely. These variables may easily be overlooked due to the low level of voluntary screening and poor attitude towards screening. Those pre-analytical variables include co-existing urinary tract infection, recent urethral instrumentation such as bougienage or catheterization, cycling, and coitus. Eliminating those variables require adequate preparation and counselling of patients before sampling.

The main aim of this study is to detemrine the PSA level of male doctors in Aba and assess the effect of some pre-analytical variables on PSA result.

II. MATERIALS AND METHODS

This study was a cross-sectional descriptive study carried out during the branch annual general meeting of Abia State NMA. Sixty-one (61) consenting male doctors above the age of 40 were randomly recruited in this study. Self-administered questionnaires were distributed to assess participants' practice of PSA screening. Questions also assessed some of the pre-analytical variables such as coitus, cycling, catheterization and lower urinary symptoms. About five milliliters (5ml) of blood was collected from each participant and dispensed into a plain bottle. Specimens were allowed to clot and centrifuged at 1500g, the serum was harvested and dispensed into plain bottle and stored at -20C for about one month until analysis. Specimens were analyzed for PSA using ELISA kit, microplate reader by APDIA AD Touch reader and washer Belgium. Control sera were run along the specimens.Data were analysed using SPSS 22. Categorical variables were expressed as counts and/ or percentages. Associations between categorical variables were tested using the Chi-square test. Continuous variables were summarized as mean ± standard deviation. Pearson's and Spearman's correlations were used to assess parametric and non-parametric data respectively and p values ≤ 0.05 were considered significant. The age of the participants was categorized as 40-49, 50-59, 60-69 and ≥ 70 years and findings compared among the groups. Results were expressed using tables..

III. RESULTS

A significant majority of the participants of this study has never had a voluntary PSA screening (64% vs 36%, $p < 0.05$) table 1. The subjects recruited for this study had their age between 40 and 75 years of age with mean age of 54.1±8.7years) and had their mean BMI in the obese range (31.4± 7.8). The systolic and diastolic blood pressures of the participant showed that they had optimal levels of blood pressure (130.6±12.9 and 84.6± 13.9 respectively). However, their mean PSA was in the equivocal limits (4.8±4.9). Table 2.

About twenty-eight (45.9%) of the subjects had a significant elevated PSA values above a cut-off of 4ng/dl compared with 33 (54.1%) subjects with PSA values below 4ng/dl (1.97±0.84 vs 8.1±5.7ng/dl respectively). A further breakdown of the PSA above 4ng/dl showed that 37.7%(23) had equivocal value while 8.2%(5) had a high PSA value Table 4.There were no significant associations among factors such as cycling, instrumentation, and symptoms suggestive of urinary tract infection and an increase PSA (p values >0.05).(Table 6).

Table 1: Distribution Of Previous Psa Screening

Previous Screening	Frequency	Percent
Yes	22	36.0%
No	64	64%

Table 2: mean± distribution of study characteristics

	MEAN (N = 61)
AGE (years)	54.1 ± 8.7
BMI (kg/m^2)	31.4 ± 7.8
SYSTOLIC B.P (mmHg)	130.6± 12.9
DIASTOLIC B.P (mmHg)	84.6 ± 13.9
PSA (ng/mL)	4.8 ± 4.9

Table 3 Age and measured variables

	Age in years				
Parameters	40- 49 ($\bar{X}$ ± sd)	50=59 ($\bar{X}$ ± sd)	60-69 ($\bar{X}$ ± sd)	70-79 ($\bar{X}$ ± sd)	P value
BMI (Kg/m^2)	31.8±5.4	32.2±10.9	29.5±2.8	28.4±3.8	0.67
Systolic Bp (mmHg)	126.7±12.4	133.8±13.1	128.1±12.5	138.0±10.9	0.13
DiastolicBp(mmHg)	82.7±7.1	87.6±16.2	76.5±7.5	92.0± 26.9	0.12
PSA (ng/ml)	4.46±3.9	3.27±2.3	10.93±9.4	3.86±2.3	0.001*

*Anova used in comparing means

Table 4: Subjects PSA levels below and above 4ng/ml

PSA (ng/ml)	< 4 (n= 33)	>4 (n= 28)	P value
Mean PSA (ng/ml)	1.97 ±0.84	8.1± 5.7	0.000*

Table 5: Categorization of Subjects Based on PSA Result

PSA (ng/ml)	Normal (<4)	Equivocal (4-10)	High (>10)	p value
Mean PSA (ng/ml) N(%)	1.99± 0.8 33(54.1)	5.94± 1.3 23(37.1)	18.8± 5.8 5(8.2)	0.000*
MeanAge(years) N(%)	53.4 ± 8.5 33(54.1)	54.9 ± 9.0 23(37.1)	53.4± 9.7 5(8.2)	0.82

P value < 0.05

Table 6: Effect of Pre-Analytical Variables on PSA

Last sexual intercourse	Normal	Equivocal	Positive	X^2/ df X^2=6.27 df=6	p- value
<24 hrs(8)	3{8.8}	5{22.7}	0{0.0}		
1-2days(13)	7(20.6)	4{18.2}	2{40}	0.65	
<2weeks(21)	15(44.1)	5(22.7)	1(20)		0.3
>2weeks(19)	9(26.5)	8{36.4}	2{40}		
Recent cycling					
Yes(20)	11{32.4}	7{31.8}	2{40}	0.13	0.91
No(41)	23{67.6}	15{68.2}	3{60}		
Recent catherterization					**0.93**
Yes(21)					
No(40)	11(32)	8{36.4}	2{40}	0.17	
	23{67.6}	14{63.6}	3{60}		

*Pearson X^2 used due to 0 cell less than 5

IV. DISCUSSION

The participants in this study represent the elites of the community with high level of education. This group of individuals are well abreast with information and are constantly strife for improvement in all forms of human endeavour. However, this study found out that they had poor practice towards voluntary PSA screening. The poor practice is similar to what was observed in the general population[9]. . The reports of Sunday et al in a study carried out among males in Lagos[9] showed a low level of awareness and voluntary screening. According to them the low voluntary PSA screening might be due to the low awareness level observed in their study. The PSA voluntary screening rate reported was 8.2% despite the high level of education of the participants. Although this value is lower than what was observed from this study, this might be due to the different study population. The participants in this study being medical practitioners as against patients used in their study. This finding is quite worrisome considering the educational background and the knowledge of the participantsThe mean BMI of the subjects showed that they were obese. This might be because of their socioeconomic class which enables them to afford variety of food items and partly due to associated sedentary lifestyle. Obesity is one of the world epidemic in that it has a link with numerous diseases such as cardiovascular disease, diabetes mellitus, chronic kidney disease and so on. It therefore, suffices that these subjects should be evident in their health promotion campaign. However, it was observed that the subjects below the age of sixty years were obese compared with those older. This may mean that the older ones were more conscious of their weight than those younger. Also, there might be a relationship between age and adoption of health promotion. This may mean that the older subjects practiced a lifestyle that promotes healthy living.

Corresponding Author: Dr Anup. Bhaisare

Department of Conservative Dentistry and Endodontic, Government Dental College ,Nagpur, India.

`The blood pressure readings of the participants revealed that they were normotensive although there was a mild increase of systolic blood pressure among those above 70 years. This might simply be as a result of the aging process. This blood pressure finding shows that the subjects attach importance to maintaining an optimal blood pressure and it is an evidence that they promote healthy cardiovascular status. These findings might simply mean that the subjects had a priority in promoting their health. They might have a higher priority to maintaining a normal blood pressure than a normal BMI. This study found that the subjects recruited for this study had an elevated mean PSA level above the widely accepted reference limit of 0-4ng/dl. This is similar to earlier reports from a study of rural Nigerian men, out of the 140 men screened for prostate cancer using PSA, 10% had elevated PSA level greater than 4ng/ml[10]. Although, the value observed in this study is higher, it might be due to some positive interferences. About twenty-three (37.7%) of the subjects had PSA value within the intermediate equivocal zone while 8.2% had PSA greater than 10ng/ml. This is similar to reports by Abbiyesuku et al who found that 20% of their study group were in the intermediate range[11], these findings indicate that many asymptomatic men have their PSA value within the intermediate range which could suggest a prostatic cancer. These subjects might benefit from further evaluation and other modalities of improving PSA result. One of such modalities is the age adjusted PSA which prevents the unnecessary prostate biopsy. According to Iya et al, there is a need for age adjusted reference interval in African men because he found out that African men have a lower PSA value when compared with their Caucasian counterpart[12] .

Ezenwa et al studied the prevalence of prostate cancer among subjects with values in the equivocal range and reported a prevalence of 13.3% of prostate cancer on biopsy findings[13]. A higher prevalent rate of 22% was reported by Catalona et al in his study among Caucasian [6]. This means that PSA values within the equivocal range does not rule out prostate cancer. However, it implies that a thorough and further evaluation are warranted. Many subjects in this range have never had a previous PSA screening and probably wouldn't have had a reason for one until they eventually develop symptoms of prostate cancer. In fact, many patients present in the advanced stage when little or no intervention could be done. Creating proper awareness and its sustenance would be the right step to reduce the burden of prostate cancer. Some authors believe that subjects in the intermediate zone should be further evaluated by prostate biopsy. However, this might lead to increase rate of unnecessary biopsies. Since, the risk of prostate cancer exists, some modalities used to improve the sensitivities of PSA include % free PSA and age adjusted PSA. % free PSA is currently being used in the evaluation of this group of individuals for biopsy to avoid unnecessary biopsy[6]. Some of the subjects with recent cycling, urinary instrumentation and symptoms suggestive of UTI had a higher PSA value. These findings might be because the subjects recruited for this study were not given enough time for preparation considering the poor attitude toward voluntary PSA screening. This is similar to earlier reports that some pre-analytical variables like prostate infection, coitus, and cycling can markedly elevate the PSA. It is therefore advisable that these patients should be sampled after (2weeks) these factors have resolved[14]. It is important that a national guideline on PSA screening be developed for routine checks even with a previous normal result. These patients would benefit from adequate preparation to avoid the pre-analytical variables that can affect the PSA result.

V. CONCLUSION

This study showed that the respondents had an elevated PSA level which may be suggestive of a prostate disease and a significant proportion were in the equivocal range for which further evaluation is indicated. Therefore, there is an attending risk for developing prostate disease among male doctors. However, adequate preparation of patients is necessary to avoid effect of pre-analytical variables. There is a need for a repeat of this test after taking proper precautions to exclude variables that could interfere with PSA assay in addition to DRE and Prostate biopsy to improve the sensitivity of the test.

REFERENCES

[1]. Parkin DM, Pisani P, Ferlay J. Estimates of the worldwide incidence of 25 major cancers in 1990. Int J Cancer 1999;80: 827
[2]. Ogunbiyi JO, Shittu OB. Increased incidence of prostate cancer in Nigerians. J Natl Med Assoc 1999;91:159‑64.
[3]. Prostate cancer in Nigerians: facts and nonfacts. J Urol 1997; 157(4):1340-1343.
[4]. Eke N, Sapira MK. Prostate cancer in Port Harcourt, Nigeria: features and Outcome. Nig J Surg Res. 2002;4: 34–44
[5]. Catalona WJ, Richie JP, Ahmann FR, et al. Comparison of digital rectal examination and serum prostate-specific antigen in the early detection of prostate cancer: results of a multicenter clinical trial of 6,630 men. J Urol. 1994;151:1283-1290
[6]. Catalona WJ, Smith DS, Ratliff TL, et al. Measurement of prostate-specific antigen in serum as a screening test for prostate cancer. N Engl J Med 1991; 324:1156-1161.
[7]. 7.Oesterling JE, Jacobsen SJ, Chute GG, et al. Serum prostate specific antigen in a community based population of healthy men: establishment of age-specific reference ranges. JAMA 1993;270:860-4
[8]. Catalona WJ, Partin AW, Slawin KM, Brawer MK, Flanigan RC, Patel A Richie JP, deKernion JB, Walsh PC, Scardino PT, Lange PH, Subong EN, Parson RE, Gasior GH, Loveland KG, Southwick PC Use of the percentage of free prostate-specific antigen to enhance differentiation of prostate cancer from benign prostatic disease: a prospective multicenter clinical trial. JAMA 1998;279:1542–1547

[9]. Sunday Oladunjoye Ogundele1,2, Stephen Odunayo Ikuerowo. A Survey of the Awareness of Prostate Cancer and its Screening among Men Attending the Outpatient Clinics of a Tertiary Health Center in Lagos, Nigeria. NigerJourSurg 2015 (12); 21: 115-118
[10]. Ukoli F, Osime U, Akereyeni F, et al. Prevalence of elevated serum prostate-specific antigen in ruralNigeria. Intern J Uro. 2003; 10 :315 –322.
[11]. Abbyesiku F.M, Shittu O.B, Oduwole O.O, Osotimehin BO. Prostate specific antigen in the Nigerian African . Afr Med Sci 2000 :29 (2) : 97-100.
[12]. D Iya, S Chanchani, J Belmente D Morris, R.H Ghew, D.J VanderJagt. Prostate Specific Antigen in Africans: a study in Nigerian men. The Nig J of surg res:2003;5:3-4
[13]. E ezenwa, K Tijani, A Jeje, A, Ogunjinmi, R Ojewo. Prevalence of prosate cancer amon Nigerians with intermediate total prostate specific antigen levels (4-10ng/ml: experience at lagos university teaching hospital, Nigeria. The internet Journal of Urology. 2012(9):3.
[14]. Delany MP, Price CP, Newman DJ, Lamb E. Kidney Function and Diseases, In: Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. 1994. 4th ed. Philadephia, Pa: Saunders; Burtis CA, Ashwood ER, eds. Pp. 818-26.

* Uche CL."Prostate Screening Among Doctors in Aba, South Eastern Nigeria ." Quest Journals Journal of Research in Environmental and Earth Science 3.5 (2017): 34-46.