EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 4
Issue: 8
50-54
Year: 2017

SEROPREVALENCE OF BLADDER TUMOR ANTIGEN IN HOSPITALIZED CATHETERIZED PATIENTS AND HEALTHY INDIVIDUALS OF DIFFERENT PROFESSIONAL GROUPS IN NNEWI

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Article Received on 08/06/2017 **Article Revised on 28/06/2017** **Article Accepted on 18/07/2017**

ABSTRACT
A study to determine the comparative analysis of seroprevalence of bladder tumor antigen in hospitalized catheterized patients and healthy individuals of different professions including smokers conducted on a total of 89 subjects (87 tests and 2 controls). Test was performed using a solid phase enzyme linked immunosorbant assay (ELISA) method with bladder tumor antigen kit. Results revealed that 7(7.9) were high normal, 7(7.9) were abnormal out of 89(100) persons. Highest prevalence of bladder tumor antigen occurred in hospitalized catheterized patients 7(7.9) and 7(7.9) respectively with significant in test group (x^2=19.450, p=0.000), while there was no prevalence in non-catheterized individuals with no significant difference (p>0.05). the profession with the highest prevalence in different age ranges was seen in painters(28.6% and 42.9% respectively) with no significant difference (p>0.05).In summary BTA was found in hospitalized catheterized patients having the highest BTA level. The most significant risk factor for BTA was in catheterized status.

KEYWORDS: *A study to determine The most significant risk factor for BTA was in catheterized status.*

INTRODUCTION

The term "Bladder Tumor" is a disease in which cancer cells form in the tissues of the blood. Almost all bladder tumors originate in the urothecium. The condition is more common in older adults. With more than half of all new cases diagnosed in people aged 75 and above. Bladder tumor characteristically causes blood in the urine. The blood in the urine may be visible to the naked eyes or detectable only by microscope (Ouslander, 2016).

Globally, bladder tumor also known as bladder cancer is the 7th most common cancer in men and the 17th in women worldwide. In Africa, it is well established that the prevalence of bladder tumor increases with age in men than women. Several factors have been identified as causes of significant increase of developing bladder tumor, although it is prevalent in catheterized patients with prostrate cancer, diabetes, heart failure and other diseases (Mary, 2016).

Abdullahi et *al.* (2016) estimated that the incidence of blader tumor in Nigeria is (1.92%). In countries surrounding Nigeria the incidence of blader tumor is highest in Chad males (3.74%) and highest in females in Niger (2.05%), when compared with Benin (1.1%), Cameroun (0.5%). Some researchers have reported that bladder cancer rates go up the longer people use indwelling catheters (Groah *et al.*, 2015; Wolfe *et al.*, 2016). The occupation people choose to do may expose them to high level of carcinogens. Which include different professional groups like textile workers, chemical industries, leather industries, hairdressers, printers, and painters (American Bladder Cancer Society, 2016).

Aim of Study

To determine the seroprevalence of bladder tumor antigen in hospitalized catheterized patients in NAUTH compared with healthy individuals of different professional groups in Nnewi.

MATERIALS AND METHODS

Study Area

This research was conducted in NAUTH and Nnewi Metropolis, Nnewi North Local Government Area, Anambra state, Nigeria.Nnewi is the second largest city in Anambra State in south eastern Nigeria. Nnewi as a metropolitan city encompasses two local government areas, Nnewi North and Nnewi South; Nnewi North is commonly referred to as Nnewi central and comprises four autonomous quarters: Otolo, Uruagu, Umudim and Nnewi-ichi. Nnewi North also includes Ichi, an autonomous neighbouring town. As of 2006, Nnewi has an estimated population of 391,227 according to the Nigerian census. The city spans over 1,076.9 square miles in Anambra State. Nnewi Metropolitan Area and its satellite towns is a home to nearly 2.5 million residents as of 2005. Geographically, Nnewi falls within the tropical rain forest region of Nigeria. Though it suffers from soil leaching and erosion which has reduced the soil in some areas to a porous sandy terrain, it remains an area of rich agricultural produce and the epicenter of business trade. The city is located east of the Niger River and about 22 kilometers south east of Onitsha in Anambra State, Nigeria.

Study Population

The study population consists of a total of 89 subjects of various age ranges consisting of 41 hospitalized catheterized patients and 48 healthy individuals of different professional groups (hairdressers, and painters), including smokers.

Research design

This is a cross sectional study designed to determine the seroprevalence of bladder tumor antigen in hospitalized catheterized patients compared with healthy individuals of different professions (hairdressers and painters), including smokers.

Sample Size

Sample size is calculated according Naing *et al*. (2006) as follows: Z^2 P (1-P)/D^2

Z= Standard normal variate (at 5% type 1 error)

P< 0.05, It is 1.96

P= Expected proportion in population.

D= Absolute error (according to earlier study by Patra (2012) on the prevalence of patients with bladder tumor in aged people)

Incidence in both sex= 1.33%= 0.0133

= $(1.96)^2$ X0.0133 (1-0.0133)/ $(0.05)^2$

= 20.12

But for this research, a total of 89 samples was used.

Ethical Consideration

Ethical approval was obtained from the Faculty of Health Sciences and Technology, Nnamdi Azikiwe University Nnewi Campus Ethical Committee.

Sampling Technique: Random sampling was used, subjects was selected based on sex, age ranges, profession, health and catheterized status.

Sample Collection/Storage: 5ml of blood sample was collected by veinopunture from the cubital fore-arm following aseptic measures as described in (Chessbrough, 2005). The blood was spunned at 15000 r/m and serum separated and stored at -20^0c in a plain tube.

Sample Analysis: Bladder tumor antigen test was performed using a solid phase Enzyme Linked Immunosorbant Assay (ELISA) method with bladder tumor associated antigen kit (PerGrande Biotech Development Co, ltd. Beijing China).

Assay Procedure

1. Patient serum was diluted 10 fold prior to use.
2. The desired number of coated wells in the holder was secured.
3. 50ul of BTAA standards, 50ul of BTAA controls, 5µl of specimens and 45ul of sample dilution was dispensed, and 50ul of BTAA enzyme conjugate reagent was dispensed into each well. The standards and controls were not diluted.
4. It was thoroughly mixed together for 30 seconds. Very important to mix completely.
5. Incubated at 37^0c for 30 minutes.
6. The incubation mixture was removed by flicking plate contents into a waste container. Rinsed and flicked the microtiter wells 5 times with 1x wash concentrate (minimum 350ul), tap water was not used.
7. The wells were striked sharply onto an absorbent paper or paper towels to remove all residual water droplets.
8. 50ul substrate A and 50 ul substrate B was dispensed into each well. Gently mixed for 5 seconds.
9. Incubated at 37^0c for 15 minutes.

Data Analysis: Data was analysed using SPSS (Statistical package for social science version 21). Simple prevalence percentage, chi square analysis, correlation and association will be used where necessary and values set at 95% confidential intervals.

RESULTS

Table 1: **General characteristics of the subject population**

	Frequency(n)	Percentage (%)
Sex		
Male	80.00	89.9%
Female	9.00	10.1%
Total	89.00	100.0%
Age		
18-25(Young Adults)	17.00	19.1%
26-59(Adults)	50.00	56.2%
60 and Above(Aged)	22.00	24.7%
Total	89.00	100.0%
Disease		
Diabetes	14.00	15.7%
Prostate cancer	13.00	14.6%
Heart disease	13.00	14.6%
Schistosomiasis	1.00	1.1%
Nil	48.00	53.9%
Total	89.00	100.0%
Catheterization		
Catheterized	41.00	46.1%
Non-catheterized	48.00	53.9%
Total	89.00	100.0%
Profession		
Mason	8.00	9.0%
Businessman	9.00	10.1%
Drug seller	5.00	5.6%
Painter	26.00	29.2%
Lab attendant	8.00	9.0%
Hairdresser	14.00	15.7%
Shoe repairer	3.00	3.4%
Textile designer	6.00	6.7%
Paint producer	6.00	6.7%
Cement seller	4.00	4.5%
Total	89.00	100.0%
Bladder Tumor Antigen		
Normal	75.00	84.3%
High normal	7.00	7.9%
Abnormal	7.00	7.9%
Total	89.00	100.0%

The table 1 above showed the General characteristics of the respondents.

From the findings 80(89.9%) were males, 9 (10.1%) were females. From the table above represent the age ranges of the respondents, from the findings 17(19.1%) were at of 18-25 years, 50 (56.2%) were at the age of 26-59 years, 22(24.7%) were at the age between 60 and above. From the table above represent the disease status of the respondents, from the findings 14(15.7%) have diabetes, 13(14.6%) have prostrate cancer, 13(14.6%) have heart disease, 1(1.1%) have schistosomiasis, 48(53.9%) were nil. From the table above represent the catheterized status of the respondents, from the findings 41(46.1%) were catheterized, 48(53.9%) were not catheterized. From the table above represent the occupation of the respondents, from the finding 8(9.0%) of respondents were mason, 9(10.1%) were businessmen, 5(5.6%) were drug sellers, 26(29.2%) were painters, 8(9.0%) were lab attendant, 14(15.7%) were hairdressers, 3(3.4%) were shoe repairers, 6(6.7%) were textile designers and paint producers respectively, while 4(4.5%) were cement sellers.from the table above shows the BTA levels of respondents75(84.3%) were normal, 7(7.9%) were high normal and normal respectively.

Table 2: Seroprevalence of bladder tumor antigen in relation to age

Age	Catheterized				Uncatheterized			
	Normal	High normal	Abnormal	Total	Normal	High normal	Abnormal	Total
18-25 (Young adults)	9 (33.3)	1 (14.3)	3 (42.9)	13 (31.7)	4 (8.3)	-	-	4 (8.3)
26-59 (Adults)	15 (55.6)	6 (85.7)	4 (57.1)	25 (61.0)	25 (52.1)	-	-	25 (52.1)
60 and above (Aged)	3 (11.1)	0 (0.0)	0 (0.0)	3 (7.3)	19 (39.6)	-	-	19 (39.6)
Total	27 (100)	7 (100)	7 (100)	41 (100)	48 (100)	-	-	48 (100)
χ^2		**3.372**				-		
P-value		**0.498**				-		

The table 2 above showed that catheterized respondents between 26-59 years (Adults) had high normal 6(85.7%) and abnormal 4(57.1%) prevalence for the bladder tumor antigen, unlike the catheterized respondents between 18-25(young adults) who had 1(14.3%) and 3(42.9%) occurrence respectively for high normal and abnormal levels. Pearson chi-square revealed that there was no significant relationship between age and bladder tumor antigen ($p \geq 0.05$) No chi-square value and P-value for non-catheterized because they had only normal BTA levels.

Table 3: Seroprevalence of bladder tumor antigen in relation to profession

Profession	Catheterized				Uncatheterized			
	Normal	High normal	Abnormal	Total	Normal	High normal	Abnormal	Total
Mason	5 (18.5)	1 (14.3)	1 (14.3)	7 (17.1)	1 (2.1)	-	-	1 (2.1)
Businessman	4 (14.8)	1 (14.3)	1 (14.3)	6 (14.6)	3 (6.2)	-	-	3 (6.2)
Drug seller	2 (7.4)	0 (0.0)	1 (14.3)	3 (7.3)	2 (4.2)	-	-	2 (4.2)
Painter	3 (11.1)	2 (28.6)	3 (42.9)	8 (19.5)	18 (37.5)	-	-	18 (37.5)
Lab attendant	4 (14.8)	1 (14.3)	0 (0.0)	5 (12.2)	3 (6.2)	-	-	3 (6.2)
Hairdresser	2 (7.4)	1 (14.3)	0 (0.0)	3 (7.3)	11 (22.9)	-	-	11 (22.9)
Shoe repairer	2 (7.4)	0 (0.0)	1 (14.3)	3 (7.3)	-	-	-	-
Textile designer	2 (7.4)	1 (14.3)	0 (0.0)	3 (7.3)	3 (6.2)	-	-	3 (6.2)
Paint producer	1 (3.7)	0 (0.0)	0 (0.0)	1 (2.4)	5 (10.4)	-	-	5 (10.4)
Cement seller	2 (7.4)	0 (0.0)	0 (0.0)	2 (4.9)	2 (4.2)	-	-	2 (4.2)
Total	27 (100)	7 (100)	7 (100)	41 (100)	48 (100)	-	-	48 (100)
χ^2		**9.819**				-		
P-value		**0.938**				-		

Table 3 above showed that the highest prevalence for high normal and abnormal BTA levels came from catheterized respondents who were painters 2(26.6%) and 3(42.9%) respectively, followed by the mason and businessmen both having 1(14.3%) and 1(14.3%) occurrence respectively for high normal and abnormal.

Pearson chi-square revealed that there was no significant relationship between profession and bladder tumor antigen ($p \geq 0.05$).

No chi-square value and P-value for non-catheterized because there was only normal in Bladder tumor antigen, hence failing to establish the susceptibility of any profession to bladder tumor antigen.

Table 4:Seroprevalence of bladder tumor antigen in relation to catheterization

Catheterization	Bladder Tumor Antigen Test			Total	χ^2	P-value
	Normal	High normal	Abnormal			
Catheterized	27 (36.0)	7 (100)	7 (100)	41 (46.1)	**19.450**	**0.000**
Non-catheterized	48 (64.0)	0 (0.0)	0 (0.0)	48 (53.9)		
Total	75 (100.0)	7 (100)	7 (100)	89 (100)		

The catheterized respondents had 36% occurrence for normal bladder tumor antigen and 100% prevalence for high normal and abnormal bladder tumor antigen, while the non-catheterized respondents presented only with normal bladder tumor antigen. Pearson's chi-square showed that there was a significant relationship ($p<0.05$) between catheterization and risk of developing bladder tumor.

DISCUSSIONS

In this study out of the 89 subjects (41 hospitalized catheterized patients and 48 healthy individuals of different professional groups : painters and hairdressers, including smokers. Among the hospitalized catheterized patients, 27(36.0) were normal, 7(100) were high normal, 7(100) were abnormal. Out of non-catheterized individuals which are painters, hairdressers and smokers, 48(64.0) were normal, 0(0.0) were high normal, also

0(0.0) were abnormal. The result showed that catheterized patients had the highest prevalence of 41(46.1) in this study. This could be as a result of sample error as the samples were not equally distributed. However, there was no significant difference between BTA levels and profession. (p>0.05).

Also, out of 89 subjects that were sampled, catheterized subjects between 26-59 years were found to have the highest prevalence having high normal 6(85.7%) and abnormal 4(57.1%) compared to catheterized subjects between 18-25 years who had 1(14.3%) and 3(42.9%) occurrence for high normal and abnormal levels,ages between 60 and above had normal BTA level.However, the relationship between BTA levels and age was not significant. (p>0.05).

CONCLUSION

Bladder health is a key component of overall health. Internal and external factors influence bladder health. Primary prevention through education regarding normal bladder structures and functioning can help promote healthy bladder habits and early treatment seeking for bladder conditions. the goal is to raise awareness about bladder health that in will inturn reduce the associated personal, societal and economic burden, including anxiety and depression related to stigma and costs associated with bladder conditions. Increases in healthcare-seeking behaviours should result from knowledge that most bladder conditions are treatable and a range of treatment options exist, including self-management. Promoting and achieving optimal bladder health can help minimise the effects of bladder conditions on the affected population, healthcare professionals, educators, employers and payors. Previous bladder health initiatives have focused largely on primary prevention of incontinence, often exclusively in women. This will promote wide-spread bladder health awareness in the context of overall health. Consensus was reached that there are established clinical directives that are generally agreed upon to promote and maintain bladder health. These include: consume an adequate amount of fluid (25–30 ml/kg per day, the amount needed to empty the bladder every 3 to 4 h), moderate consumption of foods or beverages known to irritate the bladder, adopt a relaxed position for urination and allow time for the bladder to empty, use self-management practices of pelvic floor muscle training, bladder training and pre-emptive pelvic floor contraction to improve and maintain bladder health, avoid constipation, avoid obesity;and do not smoke.

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