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Epidemiological Study of Patients with Prostate Cancer in South of Iraq

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Abstract

The present study was designed to investigate some epidemiological and serological study, in a sample of Thi-Qar, Basarh, Missan provinces south of Iraq. The sample included (32) patients, who were attending the (Basrah oncology and hematology center) in Basrah province , (Clinical oncology unit) at Thi-Qar province and (AL-Shefaa oncology center) at Misan province .The diagnosis was made by the consultant medical staff, which was based on a history inspection, clinical examination and evaluations of serum PSA level. The epidemiological results revealed that there were a significant differences in the distribution of prostate cancer, where Basrah province recorded the highest percentage (75%) of prostate cancer in comparison with Thi- Qar in percent (15.6%) , and (9.3%) in Missan. Our results revealed the highest number of patients filled in age (60-69) years and age (≥ 70) years, and low numbers in age group(50-59) years represented by (43.75, 40.62, and 15.62%, respectively). The serological study revealed that PSA level was increased with age, where the PSA level (>20 *ng/ml*) recorded the highest percentage (25%) by agegroup (≥ 70) years and followed by age group (60-69) years which recorded (18.7%), while the age group (50-59) years not recorded any percentage in PSA level (>20 *ng/ml*).

Key words: prostate cancer, prostate specific antigen.

الخلاصة

صممت الدراسة الحالية بهدف البحث عن بعض الجوانب الوبائية و المصلية والنسيجية المرضية و المناعة الوراثية لمرضى سرطان البروستات. في عينة من محافظات الجنوب (ذي قار و البصرة وميسان). شملت العينة (٣٢) مريض مصاب بسرطان البروستات الذين كانوا يراجعون مركز دم و اورام البصرة في البصرة و وحدة الاورام السريرية في ذي قار و مركز الشفاء في ميسان. شخصت الحالة من قبل الاطباء الاختصاص واعتمد التشخيص على تاريخ الحالة المرضية والفحص السريري وتقييم مستوى المستضد المصلي الخاص بالبروستات. النتائج الوبائية اثبتت ان هنالك فروقات معنوية لانتشار سرطان البروستات ، حيث سجلت محافظة البصرة اعلى نسبة (٧٥%) لسرطان البروستات بالمقارنة مع محافظة ذي قار بنسبة (١٥.٦%) و(٩.٣%) في محافظة ميسان.النتائج اثبتت العدد الكبير من المرضى كان في الاعمار (٦٠–٦٩ و ٧٠≤) سنة و اقل عدد في الاعمار(٥٠–٥٩) سنة مثلت بالنسب (٤٣.٧٥% و ٤٠.٦٢% و ١٥.٦٢% على التوالي). الدراسة المصلية اثبتت ان مستوى المستضد الخاص بالبروستات يزداد مع العمر ، حيث مستوى المستضد الخاص بالبروستات (٢٠< نانوغرام/مل) سجل اعلى نسبة (٢٥%) لمجموعة الاعمار (٧٠≤) سنة تليها مجموعة الاعمار(٦٠–٦٩) سنة والتي (١٨.٧%) بينما مجموعة الاعمار(٥٠–٥٩) سنة لم تسجل أي نسبة في مستوى المستضد الخاص بالبروستات (٢٠< نانوغرام/مل).

Introduction

The prostate is a gland found only in males. It is located in front of the rectum and below the urinary bladder. The size of the prostate varies with age. In younger men, it is about the size of a walnut, but it can be much larger in older men. The prostate's function is to make some of the fluid that protects and nourishes sperm cells in semen, making the semen more liquid. (ACS, 2012).Prostate cancer remains one of the most common cancers afflicting men today. It is the third most common cancer in the world and the second cause of cancer death in men in Western countries (Parkin *et al*., 2001). Rates of detection of prostate cancers vary widely across the world, with Asia detecting less frequently than in Europe, and especially the United States (Khudur, 2012). prostate cancer incidence and mortality rates are increasing in some Asian and European countries (Chornokur *et al*., 2011). In 2005, a total of 34,302 men in united kingdom (UK) were diagnosed with prostate cancer, and, in 2006, 10,038 men died from the disease (Burford *et al*., 2009). With lifestyle changes, the incidence of the disease has been increasing Arab population (Salim *et al*., 2009). From 1991-2006, prostate cancer was ranked first among cancers in Qatari males over 65 years old (Bener *et al*., 2008). In Kuwait, the incidence of

prostate cancer rose to 12.3/100,000 men /year in 2004 (Kehinde *et al*., 2006). In 2003, prostate cancer was ranked as the fourth most diagnosed cancer in Tunisia (Shan *et al*., 2013). In Lebanon, the incidence of prostate cancer was 21.5/100,000 men /year in 1998 (Shamseddine *et al*., 2004). In Iraq, cancer of prostate is leading cause cancer in males accounting for 3.3% of the newly diagnosed cases (Jemal A *et al*., 2004; Espey *et al*., 2007). Several factors, including age, race, family history, hormone levels, and environmental influences are suspected to play a role in pathogenesis (Wadgaonkar, 2013).Burford *et al*., 2009, referred to that prostate-specific antigen (PSA) is a glycoprotein responsible for liquefying semen and allowing sperm to swim freely. It is expressed in both benign and malignant processes involving epithelial cells of the prostate. In condition of alteration in the architecture of the prostate in conditions such as prostatitis and BPH as well as prostate cancer, PSA leaks out, leading to increased levels in the bloodstream. Over many years the Gleason system has been shown to be a powerful predictor of prostate cancer behavior, and because of the histological variation within each tumor, two grades, the predominant, or primary, grade and the less extensive, or secondary grade, were recorded as the Gleason sum score in each case (Lerner *et al*., 1996).

Aim of the study

Determine the correlation between various etiological factors and incidence of prostate cancer.

Material and method

Blood samples were obtained by venepuncture , using a 5ml disposable syringe, from 100 suspected patients. 52 from them not suffering from prostate disease, 10 from them suffering from prostatitis and 6 from them suffering from benign prostatic hyperplasia. While, 32 were suffering from prostate cancer where contacts after surgical operation from the (Basrah oncology and hematology center) in Basrah province , (Clinical oncology unit) in Thi-Qar province , and (AL-Shefaa oncology center) in Misan province . Also collected (32) blood samples from healthy men with the same age and state serve as control. Based on ages (50-59, 60-69, and ≥ 70) years, the total of patients (32) were divided into five groups (0-5.0, 5.1-10, 10.1-15, 15.1-20, and >20 ng/ml) of prostate specific antigen (PSA).

Serological studies for detect Prostate specific antigen test (TPSA):

The PSA serum that used in this study was detected according to protocol described by VIDAS® TPSA kit Biomerieux SA. France, and as following:

i. Only remove the required reagents from the refrigerator and allow them to come to room temperature for at least 30 minutes.

ii. Use one "TPSA" strip and one "TPSA" SPR(solid phase receptacle) for each sample, control or calibrator to be tested.

iii. The test is identified by the "TPSA" code on the instrument. The calibrator, identified by "S1" should be tested in duplicate. If the control needs to be tested , it should be identified by C1.

iv. Mix the calibrator, control and samples using a vortex-type mixer (for serum or plasma separated from the pellet).

v. For this test , the calibrator, control, and sample test portion is200µl.

vi. Insert the "TPSA"SPR and "TSPA" strip into the instrument. Check to make sure the color labels with the assay code on the SPRs and the Reagent strips match.

vii. Initiate the assay as directed in the User's Manual. All the assay steps are performed automatically by the instrument.

viii. . Reclose the vials and return them to the required temperature after pipetting.

ix. The assay will be completed with approximately 60 minutes. After the assay is completed, remove the SPRs and strips from the instrument.

x. Dispose of the used SPRs and strips into an appropriate recipient.

Statistical Analysis

Statistical analysis was performed with the Chi-square test. Categorical data were described as percentage; comparison done by using Chi-square test. P-value of ≤ 0.05 was used as the level of significance.

Results

Epidemiological study

The epidemiology of prostate cancer in the south of Iraq (Basrah , Misan and Nassyria province) was determined by analyzing the questioners filled up by the patients and control about their address, age and type offoodconsumed.

State distribution of patient and control in south Iraq

The distribution of patients with prostate cancer were mostly in Basrah city at percent (75%), followed by Thi-Qar city at (15.6%) and Misan city at (9.3%) as shown in table (1).

Table(1): State distribution of patients and controls

State	Patients		Controls	
	Number	%	Number	%
Basrah	24	75	24	75
Thi-Qar	5	15.62	5	15.62
Missan	3	9.37	3	9.37
Total	32	100	32	100

The P value was calculated between provinces group. There are significant differences within the groups (P≤ 0.01). ($X^2 = 78.7$, df = 2 , P value 0.01= 9.21).

Age distribution

The number of patients was maximally significant (P ≤ 0.05) in age group (60-69) years (43.75%), and followed age group (≥ 70) years (40.6%) and then (15.6%) in age group 50-59, as summarize in table (2).

Table (2): Age distribution of patients and controls

Age group (Years)	Patients		Controls	
	Number	%	Number	%
50-59	5	15.62	5	15.62
60-69	14	43.75	14	43.75
≥ 70	13	40.62	13	40.62
Total	32	100	32	100

The P value was calculated between patient and control group. Significant differences within the groups (P ≤ 0.05). ($X^2 = 14.25$,df = 2 ,P value 0.05=5.99).

Serological studies results of Prostate specific antigen

The PSA (>20 ng/ml) level showed the highly significant (P ≤ 0.01) at age group (≥ 70) years(25%), followed by (60-69) (18.7%), when compared with controls and another groups. While age group (50-59) years recorded highest percentage at PSA level (5.1-10 and 15.1-20 ng/ml), as shown in table (4).

Table (3): PSA concentration of patient and controls according to age

Age	50-59		60-69		≥ 70		Total
PSA level of patients	NO.	%	NO.	%	NO.	%	NO(%)
0-5.0	0	0	0	0	0	0	0
5.1-10	2	6.25	1	3.12	1	3.12	4(12.49)
10.1-15	1	3.12	3	9.37	1	3.12	5(15.61)
15.1-20	2	6.25	4	12.5	3	9.37	9(28.12)
>20	0	0	6	18.75	8	25	14(43.75)
Total	5	15.5	14	43.6	13	40.5	32(100)
PSA level of controls	50-59		60-69		≥ 70		Total
	NO.	%	NO.	%	NO.	%	NO(%)
0-5.0	4	12.5	10	31.25	8	25	22(68.75)
5.1-10	1	3.12	4	12.5	5	15.62	10(31.24)
Total	5	15.6	14	43.7	13	40.6	32(100)

The P value was calculated between patient and control group. Significant differences within the groups (P ≤ 0.01). ($X^2 = 24.7$, df = 8 , P value 0.01= 20.09).

Discussion

Epidemiological study

The results of the present study showed a significant differences in the distribution of the prostate cancer patients in the south Iraq cities, and recorded increased of the prostate cancer in Basrah (75%) in comparison with Nassyria (15%), and Misan (9%) (Table 4.1), but that is not mean the percentage of the prostate cancer in these cities (Thi-Qar and Misan) were in low percent, these results may be due to the most cases were collected from Basrah (24) cases, and these results may be due to the exposure to war weapon pollutant which may be promoted, this also recorded by ICR, (2008) which referred to that increases in cancer in Iraq in last years that is may be due to radiation pollutant. This study revealed that the most patients with prostate cancer fall in group of age ≥ 60 years (Table 4-2), this gives clear idea that there are a relationship between the disease and age, this confirmed by present study and by other previous studies of several authors; Walsks, (2011), who found that in united states more than (65%) of all prostate cancer are diagnosed in age men over the age of 65 and the average age diagnosis of prostate cancer is 69 years, after that age , the chance of

developing prostate cancer becomes more common than any other cancer in men, Ries et al., (2008), whose found that age is the most common risk factor with nearly 63% of prostate cancer cases occurring in men whose age was 65 and older, and in Iraq, Khudur, (2012), who found that in Baghdad city accounted (40%) of patients with Prostate cancer were in group of age (60 and above). In the present study we concluded the reason of this case (correlation the prostate cancer with ≥ 60 age), may be due to the aging and exposure to carcinogenetic agents or may be due to that prostate cancer is asymptimatic tumor and slow growing, so it is diagnosis in late stage , this result agreed with Khan,(2011).

Serological studies

Prostate specific antigen (PSA) is the preferred serum marker for prostate cancer because of its high specificity for prostate tissue (Lakhey *et al.*, 2010). The results of this study show that most of patients with prostate cancer have highly levels (>20 ng/ml) prostate specific antigen (Table 3), these results agreed with Narayan *et al*., (1995), whose found 24% of patients with prostate adenocarcinoma had serum PSA >20 *ng/ml*. Also our results compatible with Lekili *et al*., (1994), whose found 8 out of 25 (32%) prostate adenocarcinoma patients had serum PSA value >20 *ng/ml* . Recent studies by Salih *et al*., (2012), showed that patients with prostate cancer had a higher PSA concentration (more than 4.0 *ng/ml*) than in apparently healthy people (PSA concentration below 4.0 *ng/ml*), this finding indicated a positive correlation between prostate cancer development with increasing PSA concentration more than 4.0 *ng/ml*. Normal levels of serum PSA vary according to the age of the patient. PSA increases in certain disease like prostate cancer, prostatic intraepithelial neoplasia, and prostatitis, the protective layers between prostatic lumen and capillary may be broached resulting in elevation of serum PSA level (Brawer, 1999).

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