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EVALUATION OF PROSTATE SPECIFIC ANTIGEN AMONG SUDANESEPATIENTS WITH TYPE 2 DIABETES MELLITUS

Mohammed Alradi*[1], Abdelkareem .A. Abdrabo*[1], Suhair. A. Ahmed*[1], Gadallah Modawe*[2]

*[1]Department of Clinical chemistry, Faculty of Medical Laboratory Sciences, Al-Neelain University-Sudan.
*[2]Department Biochemistry Faculty of Medicine, Omdurman Islamic University Omdurman, Sudan.

ABSTRACT

Background: Patients with diabetes have been reported to be at an increased risk for cancers of the pancreas, liver, and colon; however, recent studies have suggested that men with diabetes are at a decreased risk for prostate cancer. Objectives to evaluate and compare serum PSA in type 2 diabetes mellitus (T2DM) patients and normal healthy individuals. Methodology: This is a case control study conducted in Khartoum state during the period from March to July 2015. Blood sample were obtained from 50 male patients with (T2DM) with age ranged between 35to 65 year and 50 male apparently healthy as control, with age ranged between 35to 65 year. The samples were collected and analyzed for PSA by Roche and Hitachi E411 analyzer, which is fully automated microplate system Elecrtochemiluminescense\magnetic particle. Result: the mean± SD of serum PSA were (1.14±0.66) in (T2DM) while in control were (1.50±0.84). P.values < 0.021. Conclusion: It is concluded that T2DM is associated with low level of serum PSA level.

Key words: Type 2 Diabetes Mellitus, prostate specific antigen.

INTRODUCTION

Diabetes is an epidemic disease in most countries. Worldwide, an estimated 150 million people are affected by diabetes, and this number is likely to reach 300 million by the year 2025 if successful strategies are not implemented for its prevention and control [1] The incidence of type 2 Diabetes Mellitus (T2DM) is increasing at an alarming rate both nationally and worldwide with more than 1 million new cases per year diagnosed in the US alone [2].Type2diabetes mellitus (DM) is an endocrinological disease associated with hyperglycemia characterized by both insulin resistance and defective insulin secretion [3]. Prostate specific antigen (PSA) is a glycoprotein produced primarily by the epithelial cells of the prostate gland and its regulation under the control of androgens and progestin's. It's a serine prostease with chymotrypsin –like enzymatic activity and has a molecular weight of about 30 KDa. PSA is secreted into seminal plasma at a high concentration (-.5 -3g/l), whereas lower (106 times) concentration normally found in circulation are the result of leakage. Tissues especially female breast [4].The PSA gene is member of the human kallikerin gene family, which consist of least 14 genes. All of them which encode for serine proteases, have significant homologies and structural similarities [4]. three major PSA fraction, the complex of PSA and alpha 2macroglobulin, the complex of PSA and alpha 1-antichymotrypsin (PSA –ACT) and free, uncomplexed PSA , have been identified in serum is mostly found as a PSA –ACT complex and free PSA (representing 10%-30% of total PSA) [5].

The physiological function of PSA is not yet entirely understood; it is possible that it is related to the kallikreins. The well – known and accepted physiological function is that PSA proteolytic cleaves seminogelin and

Corresponding Author :- **Abdelkareem .A. Abdrabo** Email:- abdrabokarim@hotmail.com

fibronectin are present in seminal plasma and thus cause liquefaction of the seminal clot after ejaculation . This process does promote the release and motility of sperm cells [6].Other potential functions, i.e. activity of PSA, imply its role as a cell growth inhibitor. An anticarciongenic /antiangiognic molecule, or inducer of apoptosis [4]. PSA is the most valuable prostatic cancer marker that is used for population screening, diagnosis, and monitoring of patients with prostate cancer [7]. There are some epidemiologic studies on the relationship among diabetes, prostate cancer risk and PSA, however, the result have often been discrepant and confusing Diabetes mellitus is a growing health problem due to the chronic nature of the syndrome and increasing prevalence especially in developing world [8].Prostate-specific antigen (PSA) levels are affected by many factors that may be unrelated to prostate disease, including age and race[9].

MATERIALS & METHODS

This was a prospective case control study conducted in Khartoum state during the period from March 2015- July 2013. The case group was composed of 50 patients with T2DM while the control group was composed of 50 apparently healthy individuals.

Samples collection: A coded enrollment number was given for each enrolled subject. The data were collected by using a direct interviewing questionnaire. Medical information was collected from the patient with help of the physician. The questionnaire was used to collect data regarding name, age, and medication.

Three ml venous blood were collected from each enrolled subject and poured into plain containers, left at R.T for one hour and centrifuged at 4000 rpm for three minutes to obtain sera. Sera obtained were analyzed for total PSA using roche and Hitachi E411 analyzer, which is fully automated microplate system Elecrto chemiluminescense \ magnetic particle. Statistical analysis: The data were analyzed using the statistical software package SPSS, version 20.0 (SPSS Inc., Chicago, IL).

RESULTS

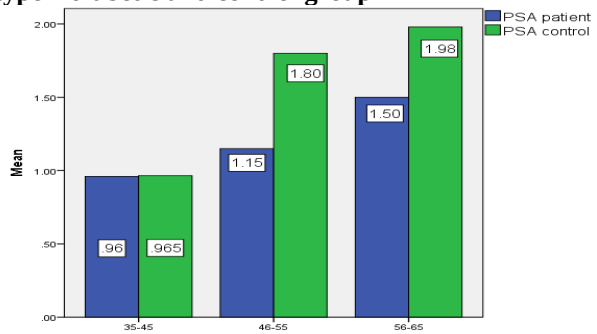
The provided a total of 100 male. 50 T2DM patients (age 35-65 years) as cases and 50 apparently healthy individuals (age 35 -65 years) as controls. The statistical findings showed that serum levels of PSA in T2DM patients were significantly lower than those of control [M±SD = 1.14±0.66 ng/dl] and [M±SD =1.50±0.84 ng/dl] respectively, (p=0.021).

Except for men aged 35–45 years, There is no statistical significant difference in the serum levels of PSA in T2DM patients and control [M±SD = 0.096±0.49673 ng/dl] and [M±SD =0.965±0.44162 ng/dl] respectively, (p=0.911). Serum PSA level increase by the age showed in (Fig. 1).

Table 1. Showed the comparison level of PSA in patient and control:

	N	Means ± SD	p- value
PSA patient	50	1.14±0.66	0,021
PSA control	50	1.50±0.84	

Figure 1. Showed the level of PSA according to age in type 2 diabetic and control group



DISCUSSIONS

Patients with diabetes have been reported to be at an increased risk for cancers of the pancreas, liver and colon; however, recent studies have suggested that men with diabetes are at a decreased risk for prostate cancer. A variety of factor can affect PSA and be taken in consideration on interpretation of results. Physical activity, infection and medicaments can cause secondary elevation of PSA; also prostate biopsy and cystoscopy usually cause substantial PSA elevation and finally, some medications can suppress PSA causing false negative result.[10] serum PSA concentration is age dependent, i.e. it tend to increase with age because the prostate enlarge with years and contain more PSA –producing tissue [11]. Androgens have been implicated in prostate tumorgenesis. Men with diabetes have significantly lower serum testosterone concentration than non-diabetic men [12], and this may partially explain their lower risk of prostate cancer. Shane felt et al.[13] reported that men whose serum total testosterone concentration was in the highest quartile were 2.34 times more likely to develop prostate cancer in a meta-analysis. However, Monath et al. [14] reported no association between serum PSA levels and serum testosterone concentration, as is the case in this study. Intraprostatic androgen status may be more important than circulating levels in determining risk of prostate cancer. Velicer et al. [15] result of a population –based study of Chinese men suggest that higher serum insulin level may influence the risk of prostate cancer in Chinese men [16].In our study we found that serum levels of PSA were lower in patients with type 2 diabetes compared with those in healthy men, which is in line with previous reports that patients with type 2 diabetes are at a decreased risk of prostate cancer. However, recent studies have suggested that men with diabetes are at a decreased risk for prostate cancer. [17].

CONCLUSION

It is concluded that T2DM is associated with low level of serum PSA level. It is suggested that its accuracy be explored in the next researches.

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CONFLICT OF INTEREST:
The authors declare that they have no conflict of interest.

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