Alteration of C-peptide and Prostate Specific Antigen on People Living with Diabetes in Owerri

Nnodim Johnkennedy¹* and Nwaokoro Joakin Chidozie²

¹Department of Medical Laboratory Science, Faculty of Health Science, Imo State University, Owerri, Nigeria
²Department of Public Health, Federal University of Technology, Owerri, Imo State, Nigeria

*Corresponding Author: Nnodim Johnkennedy, Department of Medical Laboratory Science, Faculty of Health Science, Imo State University, Owerri, Nigeria.

Abstract

Aim: This study was done to evaluate the levels of C-peptide and prostate specific antigen (PSA) on diabetics in Owerri, Nigeria.

Materials and Methods: This study involving 250 diabetics whose ages ranges from forty five years and sixty years Also, two hundred and fifty normal individuals of the same age group were used as control. Blood sample of both groups that were on fasting were collected for the assessing of C-peptide and prostate specific antigen. The levels of C-peptide and prostate specific antigen were determined using enzyme immunoassay. Statistical analysis was done using Student t test.

Results: The concentration of C-peptide in diabetics was significantly decreased when compared with the non-diabetics ($p < 0.05$). In the same vein, there was significant reduction of prostate specific antigen in diabetes when compared with the non-diabetics ($p < 0.05$).

Conclusion: This probably indicate that those with diabetes could likely have reduction of C-peptide and prostate specific antigen levels which may be beneficial in monitoring diabetics. It can be inferred that there may be decreased risk of prostate cancer in diabetes.

Keywords: C-Peptide; Prostate Specific Antigen; Diabetes

Introduction

C-peptide is a secondary product made during the synthesis of insulin. The measuring of the amount of C-peptide in blood shows how much insulin is being generated. It is necessary to note that increased C-peptide generation is followed by increased insulin generation [1].

It is a peptide composed of 31 amino acids. The pancreatic beta cells are responsible for production of C-peptide when insulin is splited from proinsulin. The kidney is the main organ for its excretion, Monitoring of insulin production is facilitated by C-peptide test [2].

Prostate-specific antigen (PSA) is generated in male mainly by prostate gland. Prostate-specific antigens (PSA) are produced by prostate cells [3]. The PSA test contribute significantly in monitoring prostate cancer in men. The human kallikrein 3 (hK3[4] exists among the family of protease. During ejaculation, prostate specific antigen flows into the semen and it liquefies semen PSA can be found in small amount in the bloodstream and in breast tissue of women [5].

It is necessary to note that C-peptide and PSA may have some relationship in diabetics. Though there is varying incidences among diabetes [6]. These reports tend be either negatively or positively correlated with diabetes mellitus and prostate cancer attributes [7].

Among the male folk, there may be reduction in some male hormone which may have relationship with the PSA concentrations [8]. There is a scarce information on the relationship between serum C-peptide and PSA levels in Owerri Nigeria. Hence, this study tends to unravel the level of C-peptide and PSA in diabetics in Owerri.

Materials and Methods

Experimental design

Two hundred and fifty confirmed diabetic patients whose ages ranges from forty five to sixty years were involved, while two hundred and fifty non-diabetic within the same ages served as control.

Sample Collection: Blood samples of about five milliliters were collected from the vein of each subjects, which was discharged into dry container. The serum for the analysis of c- peptide and prostate specific antigen was gotten after centrifugation. Informed consent of the participants was obtained.

Biochemical assay: The serum c-peptide and prostate specific antigen were determined by Enzyme link immunosorbent method [9].

Statistical analysis

Results were presented as mean ± standard deviation. The student t-test was used to calculate the significant differences at $P < 0.05$.

Result

Biochemical parameters	Diabetics	Non-diabetics
PSA (ng/ml)	1.14 ± 0.61*	2.11 ± 0.37
C-peptide (ng/ml)	0.86 ± 0.21*	1.97 ± 0.10

Table 1: Mean value of PSA and C-peptide in diabetics and non-diabetics.
*: Significantly decreased when compared with non-diabetics at $P < 0.05$.

Discussion

Diabetes is associated with increase glucose in the blood, which can lead to risk of some complications in the body [10]. The results indicated that there was a decreased value of C-peptide in diabetics when compared to the normal. When a molecule of insulin is generated there is a molecule of c- peptide [11]. This decrease in c peptide is in line with work of [12]. The decrease in c peptide could be associated oxidative stress which may affect insulin production [13]. C-peptide may be linked to insulin production and length of diabetes. as well as insulin treatment its responses [14].

Similarly, the level of PSA was significantly decreased in diabetics when compared with the control which is line with the work which hypothesized that men with long-term diabetes have a lower risk of prostate cancer than nondiabetic male [15]. This could be linked to higher concentrations of insulin and also lower androgen [16]. The concentration of prostate-specific antigen (PSA) may not be necessarily be influenced by diabetes, [17]. It is worthy of note that age, benign prostatic hyperplasia, prostatitis, and body mass index (BMI) may not be affected appreciate [18]. Diabetes and PSA screening are mostly done in individuals in age of forty-five and above. Diabetes might also influence PSA values through impaired kidney function or as a consequence of diabetes medication use [19,20].

Conclusion

In conclusion, diabetes could probably be linked with decreased C-peptide and prostate specific antigen levels which may be useful diagnostic tool in diabetes. Hence, diabetics may probably be at a lower risk of prostate cancer.

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