EVALUATION OF C- REACTIVE PROTEIN IN TYPE 2 DIABETES PATIENTS ATTENDING MADONNA UNIVERSITY TEACHING HOSPITAL, ELELE, RIVERS STATE

Arvin Nwakulite[1], *Emmanuel Ifeanyi Obeagu[1,2] 0000-0002-4538-0161, I.N. Nnatuanya[1] and Chimeremeze Odoemelam[1]

*[1]Department of Medical Laboratory Science, Madonna University, Elele Campus, Elele, Rivers State, Nigeria.
[2]Department of Medical Laboratory Science, Imo State University, Owerri, Imo State, Nigeria.*

emmanuelobeagu@yahoo.com

Abstract

The adjusted levels of C - reactive protein have been observed in diabetic patients. This study was to compare the level of type 2 diabetic patients and also to detect the level of C-reactive protein as it been affected by the disease condition. This project was done by 20diabetic patients and also 20 control subjects matched for age and sex. Serum concentration of C - reactive protein was detected using latex agglutination method. Result of this study was expressed as mean and standard deviation. Also, number of outcomes was expressed in frequencies. The result shows that out of 20 test subjects, 80% were positive to CRP, while 20% of the test subjects were negative to CRP on group 2, 40% tested positive and 60% tested negative for group 4, while the other groups in the test subject did not test positive to CRP. Also, out of 20 control subjects non-showed positive reaction to CRP. There was no significant association (p>0.05) between the present CRP and the subjects studied. The result of this study shows, that C-reactive protein investigated did not show any significant association between the subjects presented in this study.

Keywords: c- reactive protein, diabetes mellitus, type 2 diabetes patients

INTRODUCTION

Type 2 diabetes mellitus (DM) is a chronic metabolic disorder in which prevalence has been increasing steadily all over the world. As a result of this trend, it is fast becoming an epidemic in some countries of the world with the number of people affected expected to double in the next decade due to increase in ageing population, thereby adding to the already existing burden for healthcare providers, especially in poorly developed countries. Diabetes mellitus (DM) is probably one of the oldest diseases known to man. It was first reported in Egyptian manuscript about 3000 years ago. In 1936, the distinction between type 1 and type 2 DM was clearly made. Type 2 DM was first described as a component of metabolic syndrome in 1988. Type 2 DM results from interaction between genetic, environmental and behavioural risk factors (Chen *et al*., 2012).

People living with type 2 DM are more vulnerable to various forms of both short- and long-term complications, which often lead to their premature death. This tendency of increased morbidity and mortality is seen in patients with type 2 DM because of the commonness of this type of DM, its insidious onset and late recognition, especially in resource-poor developing countries like Africa (Azevedo *et al*., 2008). It is estimated that 366 million people had DM in 2011. The incidence of type 2 DM varies substantially from one geographical region to the other as a result of environmental and lifestyle risk factors (Chammnan *et al*.,2011).

C-reactive protein is a homopentameric acute-phase inflammatory protein, a highly conserved plasma protein that was initially discovered in 1930 by Tillet and Francis while investigating the sera of patients suffering from the acute stage of *Pneumococcus* infection and was named for its reaction with the capsular (C)-

polysaccharide of *Pneumococcus*. In the presence of calcium, CRP binds to polysaccharides such as phosphocholine (PCh) on microorganisms and triggers the classical complement pathway of innate immunity by activating C1q. C-reactive protein exhibits elevated expression during inflammatory conditions such as rheumatoid arthritis, some cardiovascular diseases, and infection. As an acute-phase protein, the plasma concentration of CRP deviates by at least 25% during inflammatory disorders. The highest concentrations of CRP are found in serum, with some bacterial infections increasing levels up to 1,000-fold. However, when the stimuli ends, CRP values decrease exponentially over 18–20 h, close to the half-life of CRP (Boras *et al*., 2014).

The study was done to evaluate levels of C-Reactive proteins in type 2 diabetic subjects.

Materials and methods

Study area

The study was carried in Madonna University Teaching Hospital, Elele, Rivers state.

Research design

This research is an experimental study, a cross sectional study designed to

Estimate the concentration of C-Reactive proteins in Type 2 diabetic patients attended diabetes unit at MUTH Elele.

Sample size calculation

The incidence rate of adult with Type 2 diabetes in Nigeria is 3. 84% cases. Making my prevalence rate a total of 0.038%. Using the formula below, my sample size was calculated:

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$N = Z2 \ X \ p(1 – p)/ d2$

Where

N = Minimum sample size

d = desired level of significance (0.05)

Z = confidence interval (1.96)

P = prevalence rate or proportion of occurrence =0.388 %

Therefore

$N = 3.8416 \ X \ 0.038 \ (1 – 0.388)/ 0.0025$

$N = 40$ samples

STUDY POPULATION

The study was carried in adult males and females between the age range of 15to 50years who are diabetics serving as the test and the same age range or Adults who are apparently non diabetics serving as the control.

ADVOCACYAND MOBILIZATION

With an introductory letter from my head of department and a detailed proposal

Stating the title, purpose of my research work, including its benefits to the study

population, I met with the authorities of my study area and was granted permission to work with their patients

ETHICAL APPROVAL/ CONSIDERATION

Ethical approval was gotten from the ethical committee of Madonna university teaching hospital Elele, Rivers state. The study was carried out according to the Good Clinical Practice Guidelines of the modified Helsinki declaration.

INCLUSION AND ECXLUSION CRITERIA

Inclusion: Diabetic patients, who are confirmed to have a fasting blood sugar test of above 9mmol/l were included in the study.

Exclusion: Patients with cancer, HIV, Tuberculosis, Hepatitis were excluded

EXPERIMENTAL DESIGN

40 subjects of test (diabetes) and control(non-diabetes) were grouped into 8 groups of 5 subjects.

Group 1: male diabetes between the ages of 15 to 30years.

Group 2: male diabetes between the ages of 30 to 50years.

Group 3: female diabetes between the ages of 15 to 30years.

Group 4: female diabetes between the ages of 30 to 50years.

Group 5: male between the ages of 15 to 30years (non-diabetes).

Group 6: male between the ages of 30 to 50years (non-diabetes)

Group 7: female between the ages of 15 to 30years (non-diabetes)

Group 8: female between the ages of 30 to 50years(non-diabetes)

SAMPLE COLLECTION

Fasting Blood samples (10.0ml) were collected from each subject and dispensed into plain container, fluoride oxalate and EDTA containers for C-Reactive proteins and blood glucose. That of C-Reactive proteins and blood glucose were separated and analysed immediately.

METHODOLOGY

A. Fasting blood sugar

Glucose oxidase methods

B. C-Reactive proteins

Statistical Analysis: Data obtained from this study was analyzed statistically using the statistical package for social sciences (SPSS) version 21 for window 8. The results were expressed as mean± (Standard deviation) and comparisons of different means done using independence students T-test and one way analysis of variance (ANOVA) values were considered significant at $p<0.05$ and not-significant at $p>0.05$.

RESULT

Table 1: Shows the mean ± standard deviation values of glucose in the diabetes (test) and non-diabetes control (subject) and frequency of C-reactive protein among the subjects

Test	Glucose (mmol/L)	C-reactive protein (%)	
		Positive	Negative
Group 1	10.71± 2.65	0%	100%
Group 2	11.06 ±3.45	80%	20%
Group 3	10.71± 2.65	0%	100%
Group 4	11.71± 2.65	40%	60%
Group 5	3.55± 0.99	0%	100%
Group 6	4.45± 1.00	0%	100%
Group 7	3.21± 0.99	0%	100%
Group 8	4.54±1.00	0%	100%
P-value	0.54		

From table 1, out of 20 test subjects, 80% from the test subject in group 2 tested positive and 20%tested negative to C-reactive protein and 40% of the test subject in group 4 tested positive and 60% tested negative. Also out of 20 control subjects, none showed positive reaction to CRP. There was no significant association (p>0.05) between the present CRP and the subjects studied.

The mean ± standard deviation value for glucose in the diabetic subject for group 1to 4 was 11.06±3.45. There is no significant difference (p<0.05) while for the non-diabetic subject for group 5 to 8 was 4.54±1.00. There was a significant difference for the age group (p>0.05) as shown in the table.

DISCUSSION

The result of this study shows that out of 20 test subjects, 80% from the test subject in group 2 tested positive and 20% tested negative to C-reactive protein and 40% of the test subject in group 4 tested positive and 60% tested negative. Also, out of 20 control subjects, none showed positive reaction to CRP. There was no significant association ($p>0.05$) between the present CRP and the subjects studied. Elevated levels of C-reactive protein (CRP) have been associated with increased risk of cardiovascular disease among the general population (Ridker *et al.,* 2010). People with diabetes, hypertension, and obesity have CRP levels that are higher than those in people without these conditions in the general population (Ridker *et al.,* 2010).

Conclusion

The result of this study shows that 80% of diabetic individuals within the age of 30 tested positive and 20% tested negative for group 2 and 40% of test subject (diabetes) within the age of 30 tested positive and 60% tested negative in group 4, out of 20 control subjects, none showed positive reaction to CRP. It could be suggested that C-reactive protein is positive in some individual, especially in male than in female.

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