SHORT COMMUNICATION

Relationship between casual blood sugar and body mass index in a suburban northern Nigerian population: a short communication.

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ABSTRACT
Background: *Obesity is the most important modifiable risk factor in the pathogenesis of type-2 diabetes reported in most cross sectional studies. However, racial factors seem to be important in the relationship between body mass index (BMI) and glucose intolerance.*
This study aims at defining the relationship between these variables in two suburban populations in Nigeria.
Method: *A prospective survey of Adults aged 55 years or younger who gave informed consent, in two communities (Makarfi and Giwa) near Zaria, northern Nigeria was done. The BMI and casual blood sugar using capillary blood assessed with the Ames glucometer were determined for all the subjects. Students t-test was used to compare continuous variables while Pearson's correlation coefficient was used for continuous variables; the level of significance was p<0.05 in each case.*
Result: *Three-hundred and seventeen subjects participated in the study. Mean age of subjects was 35.03 ± 9.79 years (33.0 ± 9.64 among females and 36.18 ± 9.59 among males p= 0.1007).*
Conclusion: *Female subjects had significantly higher BMI than their male counter parts, (26.61 ± 7.19 KgM^2 versus 24.01 ± 5.39, KgM^2 p=0.0341.) Casual blood sugar levels were however similar between males and females 85.21 ± 27.04 mg/dl versus 85.88 ± 14.74 mg/dl, p=0.8868.*
There was a positive but non-significant correlation between casual blood sugar and BMI among female subjects (r= +0.1520, p>0.05,) in the males however, the correlation between these variables was not significant (r= -0.0395, p>0.5).
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Key words: BMI, Casual Blood glucose, obesity, Nigeria

INTRODUCTION
Obesity is the most important modifiable risk factor in the pathogenesis of type-2 diabetes reported in most cross sectional studies.[1,2]

A positive correlation is therefore assumed to exist between casual blood sugars and obesity. However; racial factors seem to be important in the relationship between body mass index (an index of adiposity) and glucose intolerance.[3]

There are no previous studies in this environment that sought to define the relationships between these variables. This study aims at defining the relationship between these variables in two suburban populations in Nigeria.

SUBJECTS AND METHODS
Adult population sampled aged 55 years or younger, in two communities (Makarfi and Giwa) near Zaria, northern Nigeria were studied. Informed consent was sought from community and local Administration prior to the studies, and on the day of the studies consent was obtained from prospective participants. Weights were taken to the nearest 0.5kg and heights to the nearest 0.5cm from which BMI were calculated for each subject using the standard formula[1]. Capillary blood was obtained from a finger prick. Random blood glucose levels were determined using an Ames Glucometer. Those with blood sugar levels in the diabetic range were excluded in the analysis of the results.

Students t-test was used to compare continuous variables while Pearson's correlation coefficient was used for continuous variables; the level of significance was p<0.05 in each case.

RESULTS
317 subjects participated in the study, 267 (84.23%) were males and 50 (15.77%) females. Of these 43 (33males and 10 females) were excluded from analysis; 5 for blood sugar in the diabetic range and the rest for age reasons.

Mean age of subjects was 35.03 ± 9.79 years (33.0 ± 9.64 among females and 36.18 ±9.59 among males p= 0.1007). the females had significantly higher BMI than

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their male counter parts, 26.61 $\pm$ 7.19 versus 24.01 $\pm$ 5.39, p=0.0341.

Casual blood sugar levels were however similar between males and females 85.21 $\pm$ 27.04 mg/dl versus 85.88 $\pm$ 14.74 mg/dl, p=0.8868.

There was a positive but non significant correlation between casual blood sugar and BMI among the female subjects (r= +0.1520, p> 0.05,). In the males however, there was no significant correlation between these variables (r= -0.0395,p.0.5).

DISCUSSION

Obesity is probably the most important modifiable acquired risk factor in the aetiology of type 2 diabetes found in many cross sectional and longitudinal studies,[2, 4, 5]. for example a prospective study involving a cohort of normoglycaemic Swedish men, followed up for the development of type 2 diabetes mellitus, the incidence of diabetes mellitus rose by a factor of twenty-two when individuals with the highest body mass index (BMI) were compared with those who had the lowest BMI[4]. Similarly, a prospective study involving more than 7000 British men (mean follow-up of 12.8 years) established a strong positive correlation between a high BMI and the development of type 2 diabetes. These observations are expected as obesity is known to induce insulin resistance[1, 6].

It is there fore expected that BMI should correlate with blood glucose levels, this is however not always the case. A Scottish study has previously shown no significant correlation between casual blood sugar levels and body mass index[3]. Racial and other biologic factors may be responsible for this difference as was suggested in a study involving Caucasian and African-American women[7].

In this study, female subjects had significantly higher BMI than their male counterparts, and more importantly, a positive though non significant correlation has been demonstrated between BMI and blood glucose levels among the females, whereas in the males there was no correlation. The explanation for these findings apart from racial factors may also be found in the differences in the roles played by males and females in the traditional Hausa-Fulani communities. In these communities the males are the bread winners and are naturally more involved in physical exertion to meet up to their day to day responsibilities as bread winners, the females on the other hand are usually confined to their matrimonial homes and can only go out of their homes with the express permission of their spouses or male guardians. Consequently, females in these communities live a more or less sedentary life style. These differences in life-style may account for the differences observed, as exercise is known to improve insulin sensitivity ;[8] a significant determinant of blood glucose levels[9]. Our current findings are in tandem with our previous observation that glucose intolerance may indeed be commoner among females than males in our community[10]

A previous study in this environment had established the reliability of the 'Ames Glucometer'in the assessment of blood glucose levels[11] and hence its use in the present study considering its convenience in a community based study.

We conclude that BMI are higher among females in this community and correlates with casual blood glucose levels. Concerted efforts needs to be made to encourage some form of physical activity for both males and females in this community within the frame work of what is culturally acceptable this is important considering the public health implications of these findings in this community.

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