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HBAc1, RANDOM BLOOD GLUCOSE AND BODY MASS INDEX IN FRIENDS OF OBESE SAUDI MALES

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Abstract:

Background*: The magnitude of obesity among young adults is risingworldwide, the Saudi adults are not exceptional. How friendship leads to obesity and the associated problems like diabetes, depression and heart disease remains to be explored.*

Methods*: this was a prospective cross-sectional study accomplished at the Taibah University where 49 young adults who were closest friends of obese and 33 matched young adults who were closest friends of non obese were enrolled in the study. Data was obtained by a well-structured questionnaire. For the two groups BMI, RBS and HbAc1 were determined according to the standard methods.*

Results*: regarding the characteristics of each group no significant differences were observed in terms of smoking, sleeping hours and living with their families (p values were 0.418, 0.883 and 0.293 respectively). The means of BMI, RBS and HbAc1 were compared between the two groups by ANOVA test. A significant association was observed regarding the BMI (P value 0.029), whereas the association of RBS and HBAc1 was insignificant (P values were 0.289 and 0.209).*

Conclusions*: being a close friend of an obese is significantly associated with obesity. No significant association was found between being a friend of an obese and pre diabetic status.*

(keywords; friends of obese, body mass index, random blood glucose and HbAc1)

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INTRODUCTION:

Diabetes and obesity are highly prevalent problems. The relation between these two conditions is extensively explored in terms of etiology, molecular biology and management but aspects related to behavior are under investigated. One of the most challenging public health problems nowadays is obesity [(1)]. Obesity is defined as excess in adiposity which exceeds the healthy limit[(2)]. Ithas association with many diseases such as diabetes, hypertension, osteoarthritis and sleep apnea[(3)]. Body mass index is a simple equation for classification the people into obese and overweight. So, if a BMI is greater than or equal to 25 but less than 30the person is consideredan overweightperson, if a BMI is greater than or equal to 30 the person is considered an obese person[(4)].The obesity has strong association with the dietary habits and the life style of the person which may increase or decrease the fat intake and basal metabolic rate respectively.

The prevalence of obesity is increasing in the developed and developing countries, more than 1.9 billion people who are older than 18 years are overweight, and obese people are around 600 million [(4)]. Prevalence of obese people In Saudi Arabia is 28.7%. thepercentage of obese women was higher than men (33.5% - 24.1% respectively) [(5)].

Diabetes Mellitus is a multi-metabolic disorders disease characterized by hyperglycemia, which is the result of insulin secretion defect or insulin resistance that is often caused by obesity[(6)],so there is a strong association between obesity and diabetes mellitus. Worldwide, More than 9% of people older than 18 years are diabetic [(7)]. Prevalence of diabetic people in Saudi Arabia who are 25 to 34 years old is 7.8% and people who are 65 years old or more is 50.4% [(8)]. Pre-diabetic people are at high risk of developing type 2diabetes. Prevalence of pre-diabetic people in Saudi Arabia among male is 17% (1.2 million) and 15% (1 million) among females [(8)].

Hemoglobin A1C test is a blood glucose test that measures the average of blood glucose level over the past three months [(9)].The normal A1C level is below 5.7%, and if the test level is 6.5 % or above the person is considered diabetic, between them pre-diabetic[(9)].

No previous study was found in our literature review in the area investigating the relation between being a friend of an obese and liability to have diabetes. So far no studies have been conducted. The aim of this study was to investigate obesity and the pre-diabetic biochemical changes in friendsof obese individuals. Specifically, through determination of random blood glucose, HB A1C and body mass index.

MATERIALS AND METHODS:

This was a descriptive cross-sectional study. The study was conducted in Taibah University during the period from December 2015 to June 2016.

The subjects of this study included 49 Obese males (BMI : 30 kg/m^2 and above) and their closest friends and 33 non obese malesand their closest friends. Regardless whether their friends were from Taibah university or not , the obese and non obese males were asked to bring their closest friends .Then,the tests (RBG, body mass index and Hg A1C) were carried for the closest friends of obese and non obese males as well as a self-administrated questionnaire was given to all subjects(164 persons).

There were two forms of questionnaire. One was for the obese and nonobese males which covers socio-demographic and health data .The other one was for the closest friends of both obese and non obese persons which covers socio-demographic data, health, duration, depth and type of their friendship and their life style. Specific questions were included to ensure that they are the closest friends of each other.

Methods:

Random blood glucose was measured by the kits manufactured by ABBOTT DIABETES CARE with commercial name of FREESTYLE OPTIUM .Firstly we used the alcohol swap to clean the top of the thumb from the centre to outward. Secondly the blood samples had been taken by the FREESTYLE OPTIUM strip after the top of the cleaned thumb was pricked by Pressure Activated Safety Lancet which is manufactured by CAREMED INTERNATIONAL.

HgA1C was determined by DCA VANTAGE ANALYZER manufactured by SIEMENS using the DCA SYSTEM Hemoglobin A1C –Reagent kits manufactured by SIEMENS. Firstly, a blood sample taken by capillary holder (that contains capillary glass holding 1 micro liter)after pricking the top of the clean thumb was collected. Then the capillary holder was put in place withinthe DCAHb A1c REAGENT CARTRIDGE (which contains Puffer Solution Tray with Foil Seal 600 micro liter, Agglutinator, Antibody latex and Oxidant). Then the REAGENT CARTRIDGE barcode had been scanned by the analyzer barcode reader and put in place within the analyzer after that the tape (which is on the REAGENT

CARTRIDGE) was pulled to release the puffer from the tray. Finally, the analyzer was started and it took 5 minutes and 30 seconds to have the result.
The body mass index was calculated by division of the body mass in kilogram by the square height in meter.

Data Analysis:
The SPSS version16 was used for data analysis. The chi-square test was used for categorical data and the t-test was used for the quantitative data analysis and $p < 0.05$ were considered significant in the final models. ANOVA test was used to compare means.

Ethical consideration:

Free informed consent was taken after ensuring the confidentiality of the data for the subjects and the data will be used only for research purpose .

RESULTS:

The characteristics of the two groups friends of obese and friends of non obese were shown in table 1.

There was a statistically significant difference between the two groups in body mass index (P value 0.006). there is no significant difference regarding the glycaemicparameters random blood glucose (RBG) and HB Ac1. Also no differences were found regarding smoking, pattern of sleeping and living with their families.

Table 1Shows characteristics of the two groups friends of obese versus friends of non obese

Variables	Friends of obese (n=49)	Friends of non obese(n=33)	P
Smoking	12	6	0.418
Sleeping more than 6 hr	38	26	0.883
Living with their family	46	30	0.293
Normal random blood glucose (RBG)	43	31	0.355
Body mass index = 24	19	23	0.006
HB Ac1 normal	44	32	.221

In this study the means of random blood sugar, body mass index and Hb Ac1 were compared, there was a significant statistical difference in body mass index(P value 0.029). There were differences regarding the random blood sugar and HbAc1 but they were insignificant (p values were 0.289 and 0.209 respectively). This is shown in table 2.

Table 2. Means of random blood sugar, body mass index and Hb Ac1 in friends of obese and friends of non obese.

Variables	Friends of obese (n=49)	Friends of non obese (n=33)	P
Random blood sugar	99.23	93.81	0.289
Body mass index	27.06	23.79	0.029
Hb Ac1	5.3327	5.2303	0.209

DISCUSSION:

The aim of this study was to determine whether being a close friend of an obese person has an effect on the liability to obesity and diabetes. In this study there was a significant difference when we compared the BMI of the closest friends of obese with the closest friends of nonobeseThis is mostly due to the fact that lifestyle of closest companies is similar as they share many common things as eating habits and others. This does indicate the liability of friends of obese to turn into obese.

In the literature homophily (tendency to select similar friends) was taken as the explanation for the observed association between friendship and obesity [10], [11].

Although there was no significant difference between the two groups interms of HBA1c and RBS, BMI is

among many non glycaemic factor that affect HbAc1and it can has contributory effect as a predictor of diabetes [12].This difference was not related to smoking, sleeping our and living with families.. There were no similar studies found in the literature.

This study is not in line with the findings of Bruening et al, who found that white girls had more than double the chance of being obese in their friends were obese. On the contrary no such a relation was found in American boys[13] . Since our study was conducted entirely on males. Ethnicity was found to affect the perception of obesity among different groups, this raises the issue of ethnicity in our study.

There were no significant differences between the HgA1C and RBG between the two groups, as there were no significant differences between the means of random blood sugar, and Hb Ac1 in friends of obese and friends of non obese. The insignificant differences in HbAc1 and RBS could be attributed to small sample size.

In conclusion being a friend of an obese increases the liability to obesity, the liability to diabetes needs to be investigated in a large-scale study. The influence of friendship should be considered in any future strategy addressing the prevention of obesity and prediabetes.

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