PREVALENCE OF PRE DIABETES AND DIABETES MELLITUS AMONG AL-AZHAR UNIVERSITY MALE STUDENTS HOSTEL IN CAIRO EGYPT

"CROSS SECTION STUDY"

By

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ABSTRACT

Background: Diabetes mellitus (DM), is a group of metabolic disorders in which there are high blood sugar levels over a prolonged period. If left untreated, diabetes can cause many complications.

Objective: To identify the pre-diabetes and diabetes among Al-Azhar University male students Hostel.

Subject and Methods: A cross section study of 400 students from Al-Azhar University male students Hostel in Cairo Egypt during the period from first of October 2018 to the end of May 2019.

Results: Body mass index (BMI), overweight and obesity were statistically significantly associated with the risk of being diagnosed with DM among individuals without any other prior evidence of DM. The risk of DM diagnosis was increasingly larger for individuals in higher BMI categories than for individuals in lower BMI categories.

Conclusion: There was a positive correlation between HbA1c, body mass index (BMI) and Family history.

Keywords: Pre-diabetes, Diabetes mellitus, AL-Azhar University students, BMI.

INTRODUCTION

Diabetes mellitus (DM) is one five principal causes of death universally *(Ding and Choi, 2015)*. A recognized basis to prevent this condition is to classify common modifiable risk factors that have an ultimate impact on the morbidity on top of developing community based programs for its control and prevention. Normally, by the time, an individual is diagnosed. They have a tendency to develop various complications, such as ischemic heart disease (a macroangiopathic procedure) or retinopathy (a microangiopathic process) *(Okwechime and Roberson, 2015)*.

DM is of the commonest non communicable chronic disease with high worldwide prevalence in the current situation. Along with this, the pre-diabetic

stage has also become prevalent. It is estimated that in 2025, 300 million people will be affected, and so it continues to be worldwide-growing epidemic *(Hjelm et al., 2013)*. Globally, its prevalence has been found to be increasing, and by 2030 it can rise up to < 470 million people suffering from it *(Gossain and Aldasouqi 2010)*.

The decreasing age at onset of obesity has alarming public health implications *(Cunningham et al., 2014)*. Obesity-related metabolic abnormalities such as pre-diabetes and diabetes are becoming increasingly more common at progressively younger ages. The onset of DM is preceded by a long asymptomatic phase, represented by the presence of impaired fasting glucose (IFG) and/or impaired glucose tolerance (IGT), two distinct phenotypes of pre-diabetes with only partial overlap *(Giannini and Caprio, 2013)*.

Although current guidelines recommend that the screening for altered glucose metabolism should start at 10 years of age (or at the onset of puberty, if puberty occurs at younger age). Scattered data suggest that pre-diabetic conditions, such as impaired fasting glucose (IFG) and impaired glucose tolerance (IGT), are emerging among obese youths at younger ages *(Morrison et al., 2012)*.

The present work aimed to estimate the prevalence of pre-diabetics and diabetics as well as the risk factors in male students Hostel of Al-Azhar University.

SUBJECTS AND METHODS

A cross section study was conducted to identify new cases of pre-diabetics or diabetics, and to identify the risk factor of these cases among Al-Azhar University male students Hostel in Cairo, Egypt from the first of October 2018 to the end of May 2019.

The sample (400) was chosen by a stratified random technique from all students of the Hostel of Al-Azhar University in Nasr city, Cairo, Egypt.

All students were subjective to the following:

1. Complete history taking (name, age, sex, smoker, personal history, family history, and past history).

2. Full clinical examination.

3. BMI was calculated as weight in kilograms divided by height in meters squared (kg/ m^2) Normally, BMI > 25, overweight (25>BMI>30), and obese (BMI <30) groups were composed based on widely used cutoff values for assessing obesity *(Lean et al., 2018)*.

4. Laboratory investigation in clouded, random blood sugar, fasting blood sugar, post prandial blood sugar and HbA1c.

Blood sampling:

Fasting blood sample wear collected after at least 8 hours from last meal, Post prandial blood sample was collected 2 hours after ingestion of 75g glucose, and HbA1c blood sample was collected with post prandial blood sample.

The sample was collected in tubes without additional anticoagulant and allowed to stand at room temperature for 30 to 60 minutes, and then the sample was centrifuged to obtain serum which was stored at 20 until assayed.

Approval was being obtained from the scientific ethical review committee. An informed verbal consent was obtained from every student involved in the study.

Statistical analysis:

Analysis of data was performed with a personal computer using SPSS Prism.

Statistical presentation and analysis of the present study was conducted, using the mean, standard deviation, Pearson correlation coefficient test by SPSS V.22.

Linear Correlation coefficient was used for detection of correlation between two quantitative variables in one group. P value > 0.05 was considered significant.

RESULTS

This was a cross sectional open study of 400 students in Hostel of Al-Azhar University in Cairo. Their ages were between 18 and 24 years with a mean of 21 years all of them wear means. The mean value of age of studied sample was 20.74±1.28, mean values of HA1C was 5.83±0.37, the mean value of BMI was 23.22±2.34. The mean value of fasting

blood glucose and PP.BL sugar was 114±15.14 and 171±26.39 respectively. The mean value of Systolic blood pressure, diastolic blood pressure, RBCs, and HR was 115.3±11.89 76.84±8.36, 112.7±46.18 and 84.05±6.16 respectively. 31.5% of the studied sample having smoking history and 27.75% having a family history of diabetes **(Table 1)**.

Table(1): Demographic and laboratory data of the studied sample

Parameter		Mean ± SD
Age		20.74±1.28
glycated hemoglobin (HbAIC)		5.83±0.37
Body mass index (BMI)		23.22±2.34
Fasting blood glucose		114±15.14
Post pradinal blood Sugar		171±26.39
Systole		115.3±11.89
Diastole		76.84±8.36
Random blood sugar (RBs)		112.7±46.18
Heart rate (HR)		84.05±6.16
Smoking history		126(31.5%)
Family history	Positive	111(27.75%)

The correlation between the HA1C and (age, smoking, heart rate, family history and BMI) in the studied sample was not significant as (p>0.05). But there was a significant direct relation between HA1C and BMI **(Table 2)**.

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Table (2): The correlation between the HA1C and age, smoking, heart rate, family history and BMI

Parameters	HbA1c p value
Age	0.108
Family history	0.0002*
Smoking history	0.050
BMI	<0.0001
Heart rate	0.756

There were risk factors for diabetes mellitus as smoking, hypertension, obesity and dyslipidemia whish more common in both hypertension and obesity with percentage of 64.3% and 59.5% respectively (**Table 3**).

Table (3): Risk factors of diabetic patients in this study

Parameters / Risk factor	Cases of positive	percentage	Cases of negative	percentage
Smoking	19	45.2 %	23	54.8 %
Hypertension	15	35.7 %	27	64.3 %
Obesity	17	40.5 %	25	59.5 %
Dyslipidemia	22	52.4%	20	47.6 %

HbA1c and family history showed significant correlation (**Figure 1**).
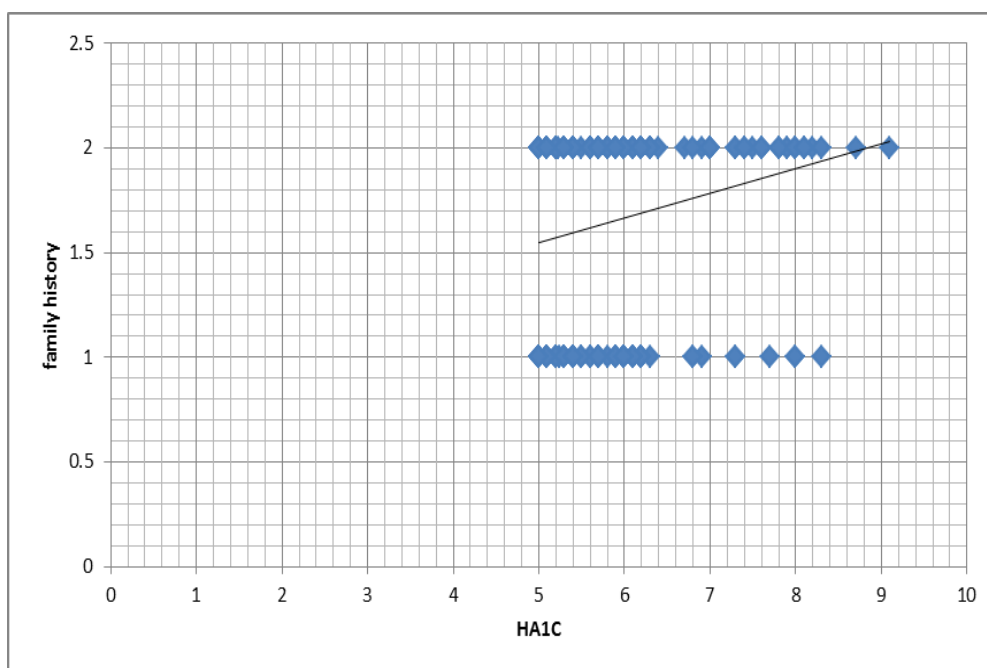
Figure (1): Correlation between the HA1C and family history.

HbA1c and BMI showed significant correlation (**Figure 2**).
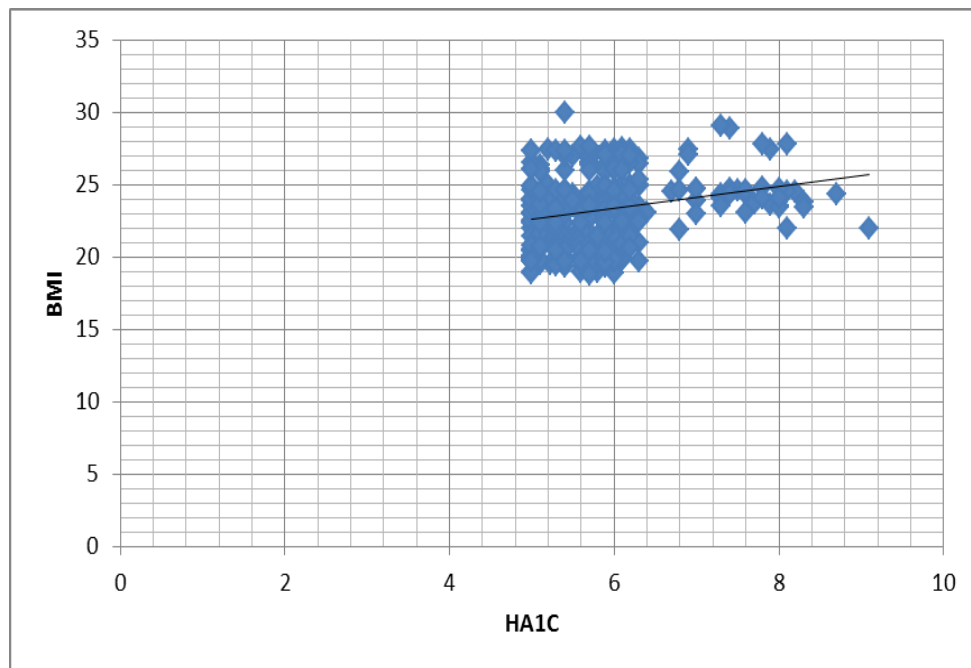
Figure (2): Correlation between the HA1C and BMI

DISCUSSION

The present study was designed to explain pre diabetic and diabetic in male students hostel of Al-Azhar University and to identify the most common risk factors. The present study included 400 male students. Their ages ranged between 18 and 24 years with a mean of 21 years. There were statistical significant correlations between HbA1c level, BMI and family history of diabetes mellitus.

According to the BMI the results of the current study revealed that were positive correlation between HbA1c level and the BMI (age –weight relation).

In agreement with our study, *Mokdad and Burk (2015)* found that there were positive association between HbA1c level and BMI in

Diabetes mellitus and BMI was a risk factor for development DM.

Hsu (2015) found that BMI ≥ 25 kg/m^2 is a risk factor for diabetes. However, data suggest that the BMI cut point should be lower for the Asian American population.

According to family history of diabetes mellitus, the results of the current study revealed that there was a positive association between the HbA1c level and the family history of diabetes mellitus.

In agreement with our study, *Meigs et al. (2011)* found that there were positive association between HbA1c level and family history of diabetes mellitus and metabolic abnormalities of DM. Also, *Tripathy et al. (2013)* who found that there were positive association between HbA1c level and

family history of diabetes mellitus and metabolic abnormalities of DM.

Hyperlipidemia is a powerful risk factor for atherosclerosis and related disorders such as ischemic heart disease, cerebrovascular diseases and retinal atherosclerosis *(Gnaneswaran et al., 2013).*

Smoking may increase the risk of DM, therefore, evaluation for tobacco use and referral for tobacco cessation, if indicated, should be part of routine care for those at risk for diabetes. Of note, the years immediately following smoking cessation may represent a time of increased risk for diabetes *(Hu et al., 2018).*

The present study showed that there were no association between HbA1c level, and heart rate, sex, age and smoking.

CONCLUSION

Diabetes mellitus along with its chronic complications is a serious public health concern. Individuals having pre-diabetes are becoming diabetic at a faster conversion rate. Therefore, it is extremely important to hinder, this process at an early stage.

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معدل انتشار مرض السكر ومؤشراته بين طلبة المدينة الجامعية للأزهر بنين بالقاهرة

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خلفية البحث: مرض السكري من أمراض اختلال عمليات الأيض والتى يحدث فيها ارتفاع معدلات السكر في الدم لفترة طويلة واذا ترك بدون علاج سيؤدي الى العديد من المضاعفات.

الهدف من البحث: معرفة حالات ما قبل السكري والسكري بين طلاب المدينة الجامعية بنين بجامعة الأزهر.

الأشخاص وطرق البحث: تم عمل دراسة مسحية على أربعمائة طالب من المدينة الجامعية للأزهر بنين في القاهرة ما بين فترة الأول من أكتوبر 2018 وحتى نهاية مارس 2019.

النتائج: مؤشر كتلة الجسم وزيادة الوزن والسمنة ذو علافة طردية مع عوامل الخطورة لمرض السكر بين الأفراد الذين لديهم مؤشر لمرض السكر مقارنة بالأشخاص الطبيعية.

الخلاصة: هناك علاقة طردية بين السكر التراكمي ومؤشر كتلة الجسم والتاريخ المرضي للأسرة.