ORIGINAL ARTICLE

PREVALENCE OF PRE-DIABETES AMONG STUDENTS OF AYUB MEDICAL COLLEGE, ABBOTTABAD

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ABSTRACT

BACKGROUND: The world is facing the challenge of combating Non-communicable diseases. One of the most important in the list of non-communicable diseases is Diabetes Mellitus. Diabetes is not a single disease but a group of metabolic disorders occurring either due to decreased insulin secretion, or resistance to insulin actions on target tissues, or most commonly both.This study was conducted to know the number of students with Pre-diabetes.

METHODS: This cross sectional survey was conducted from March 2016 to June 2016 on MBBS and BDS students of both genders.Sampling technique was probability simple random. The socio-demographic data and data about family history, dietary habits, etc was collected through questionnaire. The blood sugar level was measured by students themselves after practicing the technique properly and under supervision with a standard Glucometer.

RESULTS: Out of 138 students, 129 were respondents and 15(11.6%) of them were found Pre-diabetics. Their ages ranged from 18 to 25 (mean 21.53 with standard deviation 1.73). Fasting blood sugar levels were 70 minimum and 108 maximum (Mean 90.53 ±7.41). Pre-diabetics were more in male students as compared with female students. 11 male out of 78 total male students and 4 out of 51 female were found Pre-diabetics. Blood sugar level also increased with increase in BMI.

CONCLUSION: Increased BMI, decreased physical activity, and dietary habits showed an increase in the prevalence of prediabetes within the student population.

KEY WORDS: Prevalence, Impaired Fasting Glucose, Impaired Glucose Tolerance, Pre-diabetes, Diabetes.

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INTRODUCTION

The world is facing the challenge of combating Non-communicable diseases.[1,2] One of the most important in the list of non-communicable diseases is Diabetes Mellitus.[1] Diabetes is not a single disease but a group of metabolic disorders occurring either due to decreased insulin secretion, or resistance to insulin actions on target tissues, or most commonly both. According to American Diabetes Association (ADA), it is defined as, a condition characterized by hyperglycemia resulting from the body's inability to use blood glucose for energy.[3]

It is now a disease affecting both developed and developing nations.[4] It affects every age group as well.[4] Scientists are now regarding it as a pandemic.[5,6] In 2014 the global prevalence of diabetes was estimated to be 9% among adults aged 18+ years. World Health Organization (WHO) projects that diabetes will be the 7th leading cause of death in 2030. According to another WHO survey, it was the cause of 1.5 million deaths worldwide directly. [7] A recent survey by International Diabetes Federation (IDF) showed, one in 11 adults has diabetes and in 2040 one in 10 will have diabetes. In Southeast Asia, it is estimated that there is 8.6% prevalence of diabetes.[8]

Nowadays a major problem is the occurrence of diabetes in young and adolescents.[9] Type 2 diabetes as known is relatively asymptomatic and remain undiagnosed most of the time.[10] It remains asymptomatic and this asymptomatic period is known as pre-diabetes. It is a condition in which fasting blood glucose is raised but not high enough to be diagnosed as diabetes. It is also called impaired glucose tolerance (IGT) or impaired fasting glucose (IFG).[11] According to IDF, Pakistan ranks no. 8 in having people with IGT.[8] This condition increases the chances of developing full blown diabetes and cardiovascular diseases.[11,12]

Certain diagnostic tests such as fasting plasma glucose if done earlier can diagnose the condition beforehand. More importantly, the disease process can be halted and if the steps are taken earlier complications can be avoided.[13,14] This study was conducted to estimate the prevalence of pre-diabetes in students of Ayub Medical College, Abbottabad.

MATERIAL & METHODS

This survey was conducted in Ayub Medical College, Abbottabad,Pakistan. It was a cross sectional survey. The duration of study was from March

2016 to July 2016. Sample size was calculated by WHO sample size calculator. Sample size turned out to be 138 out of total population of 1200 and simple random sampling was then performed.

Students who were diagnosed as having type 1 or type 2 Diabetes, were excluded from the study. A standard gluco meter was used for measurement of fasting blood sugar levels of students. Students were asked to fast overnight for 8 hours at least, and then early morning fasting sugar level was checked through capillary blood by pricking their finger tip. Great care was taken during pricking and sterile lancets and glucose measuring strips were used.Data collected was analysed using SPSS version 23.

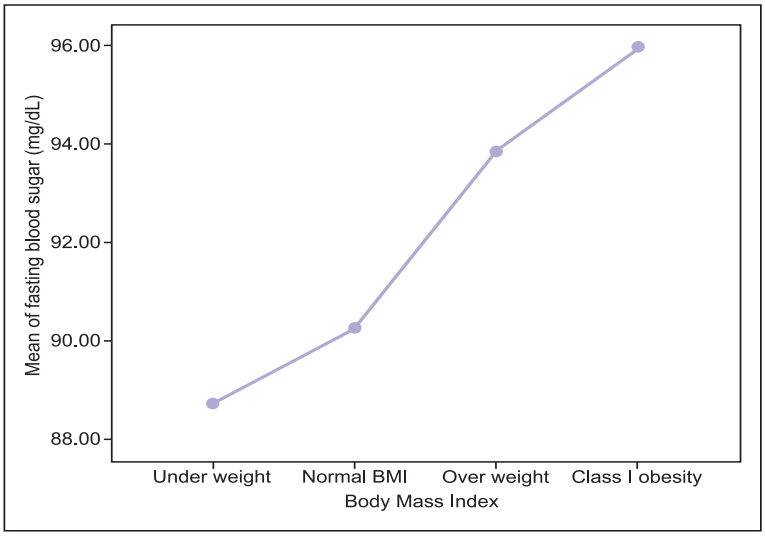
RESULTS

Out of total eligible 138 students, 129 students responded. 79 (61.2%) were male and 50(38.8%) were females. Their age ranged from 18 to 25 years (mean age 21.5 ±1.732). Of the students, 15(11.4%) were pre-diabetic i.e, blood sugar level was more than 100mg/dl. Of the 15 total students 11(73.33%) were males and 4(26.66%) were females. Mean level of blood sugar was 89.8 ±8.0 mg/dl in male students while 92.4 ±5.6 mg/dl in female students.

TABLE 1: CHARACTERISTICS OF STUDY PARTICIPANTS N(%)

Characteristic	Yes	No
Family history of diabetes	50(38.8)	79(61.2)
Regular exercise	40()	89()
Smoking status	19(14.7)	110(85.3)
Sweet beverages consumption	64()	65()

FIG 1: BODY MASS INDEX VS FASTING BLOOD SUGAR



DISCUSSION

Out of 129 students 15(11.62%) of them were found to be prediabetic as per criteria of American Diabetes Association (ADA). A study by Malik et al, in 2013 at a medical college in Pakistan, reported no prevalence of Pre-diabetes.[15] This difference in results could be due to sample size as our sample size was almost double of their study sample size.

Pre-diabetes as shown by multiple large studies tend to be more prevalent in male as compared with females. A study conducted by P Zimmet and others showed, the most consistent and statistically significant difference was that impaired fasting glucose was more common in men than women in virtually all age groups, typically being 1.5–3 times higher, but up to seven or eight times higher in Europeans aged 50–70 years.[6] In context with that the male to female students ratio was almost triple as 11 out of 15 male students had prediabetes and 4 out of 15 female had prediabetes.

There were 50(38.75%) students who had family history of diabetes and 8(16%) of them had prediabetes and 79(61.24%) students did not had family history but out of them 7(8.9%) had Pre-diabetes. The results were statistically insignificant. Other studies have shown that family history is a strong risk factor for development of diabetes and Pre-diabetes.[16] A nationwide (ICMR INDIAB) study in South India, showed that the prevalence rates of diabetes and pre-diabetes were 10.4% and 8.3% respectively, with OR of 1.5[17]. Physical activity is a known preventive method for various chronic diseases. The results were 40(31.00%) total students who had regular exercise and out of them 3(7.5%) had Pre-diabetes while 89(68.99%) students were not doing any physical activity and out of them 12(13.5%) had Pre-diabetes. This study revealed no statistical significance between physical activity and prediabetes. The Indian study IDDP-1 and a trial in Japan showed risk reduction of 28.5 and 67.4 % of prediabetes for people who did regular exercise[14,18].

The CARDIA study shows direct relationship between fast foods consumption and weight gain which subsequently leads to insulin resistance and ultimately prediabetes or overt diabetes[19]. But this study had an inverse relationship between fast food consumption and prediabetes. Wannamethee et al and Julie et al showed that cigarette smoking is an independent and modifiable risk factor for diabetes development more over Julie also disclosed that risk increases as smoking increases [20,21].

Diabetes and Pre-diabetes incidence and prevalence are more in overweight and obese people. The mean blood sugar of the study participants amplified as the BMI rose. In an analysis, the odds ratio for abdominal obesity was more in predi-

abetics envisaging that Pre-diabetes was more in obese people.[18]Also in obese young people there is more risk of Pre-diabetes because there is intra-abdominal fat which is both responsible for decrease secretion and increase resistance of insulin. This action is due to fat macrophages which induce these changes and creates a chronic inflammatory state and also secrete different adipokines which in turn causes insulin resistance.[22] These changes in obese people prone them to Pre-diabetes more as compared with normal people.

CONCLUSION

Prediabetes, an escalating medical condition in the world of today, poses as an obstacle for those who are diagnosed with .Though many complications can ensue from this condition, it can be prevented. Increased BMI, decreased physical activity, and dietary habits showed an increase in the prevalence of prediabetes within the student population. As data on prevalence of non-communicable diseases prevalence is scarce so more research should be done to correctly estimate the number of population at risk.

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CONFLICT OF INTEREST

None declared.

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NIL

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.