Diabetes Mellitus among Male Students of Jeddah University in Saudi Arabia

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Abstract

Aim: To screen for diabetes among students of Jeddah University in the KSA. **Methodology:** A cross sectional descriptive study involved n= 42 students of Jeddah University in the KSA who are 18 to 21 years of age. Random sampling methods used, data were collected by measuring random blood glucose level (RBG) of all participants by using glucometer (Bioniam GM300), for four months from 2 April 2014 to 12 of August 2014. Results: 4.76% students had a high level of blood sugar, which classified as prediabetes, the most of students showed an ideal level of random blood glucose to be 95.25% in which RBS level below 140 mg/dL. **Conclusion:** Male students of Jeddah are free from diabetes mellitus.

Keywords: *Diabetes Mellitus, students, Jeddah university, Saudi Arabia*

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1.   Introduction

Diabetes Mellitus (DM) is a group of chronic metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both [1]. Insulin is a hormone made by the pancreas works as a "key" that helps in entering the sugar in bloodstream into the cells which is required for energy production [2]. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of various organs, especially the eyes, kidneys, nerves, heart, and blood vessels [3].

1.1. Types of Diabetes

There are three main types of DM, which include Type I, Type II and gestational diabetes [4]. Type I Diabetes (T1DM), is also called juvenile diabetes or insulin dependent diabetes is a chronic illness characterized by the body's inability to produce insulin due to the autoimmune destruction of the beta cells in the pancreas. Onset most often occurs in childhood, but the disease can also develop in adults in their late 30s and early 40s [5-7]. T1DM is require lifelong insulin therapy [8]. Most require two or more injections of insulin daily, with doses adjusted on the basis of self-monitoring of blood glucose levels [9]. In some patients, the onset of T1DM is marked by an episode of diabetic ketoacidosis (DKA) but is followed by a symptom-free "honeymoon period" in which the symptoms remit and the patient requires little or no insulin [10].

Type 2 diabetes mellitus (T2DM), adult-onset diabetes or non-insulin dependent diabetes consists of an array of dysfunctions characterized by hyperglycemia and resulting from the combination of resistance to insulin action, inadequate insulin secretion, and excessive or inappropriate glucagon secretion T2DM is more common than T1DM [11]. T2DM is usually associated with being overweight (BMI greater than 25), unhealthy eating choices, and lack of exercise [12]. And while it's true that too much body fat and physical inactivity does increase the likelihood of developing type 2, even people who are fit and trim can develop this type of diabetes [13].

Gestational diabetes (GDM) develops during pregnancy (gestation). It causes high blood sugar that can affect your pregnancy and your baby's health [14]. Women older than age 25 are more likely to develop GDM [15]. Diet is the mainstay of treatment in GDM whether or not pharmacologic therapy is introduced. However some women suffering from GDM cannot be managed with diet alone to optimize pregnancy outcomes and need to use insulin [16,17].

1.2. Prevalence of Diabetes
Globally, as of 2010, an estimated 285 million people had diabetes, with type 2 making up about 90% of the cases [18]. In 2013, according to International Diabetes Federation, an estimated 381 million people had diabetes [19]. Its prevalence is increasing rapidly, and by 2030, this number is estimated to almost double [20]. Diabetes mellitus occurs throughout the world, but is more common (especially type 2) in the more developed countries. The greatest increase in prevalence is, however, expected to occur in Asia and Africa, where most patients will probably be found by 2030 [21]. About 415 million people have diabetes in the world and more than 35.4 million people in the Middle East and North Africa (MENA) Region; by 2040 this will rise to 72.1 million [22]. There were 3.4 million cases of diabetes in Saudi Arabia in 2015 [23]. There is a crisis that is impacting health care in the Arab nations of the MENA: six countries in this region are on the top-ten list worldwide in terms of diabetes prevalence. Comprising 22 countries with a total population of 350 million people, these nations constitute only about 5% of the total world population. Yet, nearly 20% of the people in Kuwait, Lebanon, Qatar, Saudi Arabia, and the United Arab Emirates (UAE) are diabetic. Not to be forgotten is the likelihood that between 41% (Oman, Saudi Arabia, and the UAE) to 62% (Algeria, Egypt, Iraq, Jordan, occupied Palestine, Sudan, and Tunisia) of the population is suffering from undiagnosed diabetes. Currently, nearly 10% of all adult deaths in Arab countries are related to the complications of diabetes [24-26].

The kingdom of Saudi Arabia (KSA) is rapidly developing country with a change that influenced the lifestyle of the people towards urbanization , particularly over the past 3 decades. previous surveys from KSA suggested that diabetes is present in epidemic proportions throughout the country with exceedingly high rates concentrated in urban areas [27]. The definitions proposed by American diabetes association and adopted by World health Organization (WHO) are as follows: an individual is said to have diabetes mellitus when a random vale at or above 200mg/dL [28].

1.3 Aim and Objectives
Aim: To screen for diabetes among students of Jeddah University in the KSA.

Objectives:

To determine the prevalence of DM among students of Jeddah University in the KSA.

2. Subjects and Methods

2.1. Study Design
A cross sectional descriptive study.

2.2. Study Population
Students of Jeddah University in the KSA who are 18 to 21 years of age.

2.3. Sample and Sampling
Forty-two male students were selected by random sampling method.

2.4.Data collection and analysis
Data were collected by measuring random blood glucose level (RBG) of all participants by using glucometer (Bioniam GM300), for four months from 2 April 2014 to 12 of August 2014.

2.4.1 Data analysis
Microsoft Excel 2016 program was used to data entry and analysis.

2.4.2 Selection Criteria
Subjects who were eligible to participate in the study were those who met the following criteria. Inclusion Criteria : All students who are healthy without history of hyperglycemia or endocrine disease. Exclusion Criteria : Those diagnosed with diabetes mellitus, hyperthyroidism or hyperparathyroidism, post recent acute infection, recent trauma or surgical intervention, those who were taking insulin preparations, vitamin-mineral supplements, and hormone replacement therapy.

2.4.3. End-Point Ascertainment and Definitions
The reference values for a "normal" random glucose test in an average adult are 79 - 140 mg/dl (4.4 - 7.8 mmol/l), between 140 - 200 mg/dl is considered pre-diabetes, and > 200 mg/dl is considered diabetes according to ADA guidelines (you should visit your doctor or a clinic for additional tests however as a random glucose of > 200 mg/dl does not necessarily mean you are diabetic) [1].

2.4.4.Ethical consideration
Permission was obtained from the faculty of medicine through the dean of medicine before the beginning of the study. Participants, who showed a high glucose level after RBG test and do not have a history of the disease, are advised to do the fasting blood glucose test in a nearby health care clinic.

3. Results and Discussion

According to Figure 1, the level of RBG levels among students at Jeddah University to diagnose someone with diabetes when RBG is 200 mg/dL which was 0 % (0), while about 4.76% (2) had RBG level from 140 to 200 mg/dL, and the most of students showed an ideal level of random blood glucose to be 95.2 % (40).

According to the result of study and to the criteria of diagnosing DM by random blood glucose testing [1], there was not ant student diagnosed as diabetic. This result could be explained by the young age of the students involved in this study, which is consistent with the fact that diabetes is increasing with age [29]. Although type 2 diabetes is not common in the younger population (≤ 20 years of age), there is some evidence that this age-group is still at risk. A recent report from the Centers for Disease Control and Prevention indicated that the rate of diabetes onset is greater among youth aged 10–19 years compared to their younger (< 10 years of age) counterparts [30].
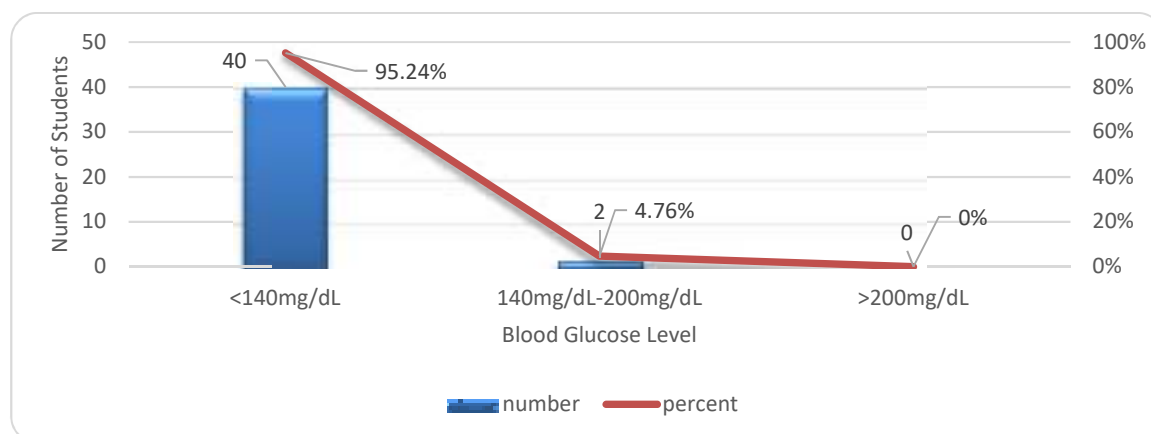
Figure 1: Random Blood Glucose levels of students at Jeddah University

In the current study, about 4.76% students had a high level of blood sugar, which classified as prediabetes. This agrees with statistics of the American Diabetes Association (ADA) [31] that revealed 29.1 million, 21.0 million were diagnosed, and 8.1 million were undiagnosed. About 208,000 Americans under age 20 are estimated to have diagnosed diabetes, approximately 0.25% of that population. In 2008—2009, the annual incidence of diagnosed diabetes in youth was estimated at 18,436 with type 1 diabetes, 5,089 with type 2 diabetes.

4. Conclusion & Recommendations

In conclusion, DM was not prevalent in students involved in our study, however students with high blood sugar should be aware of the symptoms of DM and are encouraged to follow up by repeated testing of blood sugar. It's recommended to conduct a large survey to early detect diabetes and non-communicable disease and also assess knowledge of it.

Acknowledgements

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