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PREVALENCE OF TYPE 2 DIABETES MELLITUS AMONG WOMEN AND THE ASSOCIATED RISK FACTORS IN JEDDAH

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ABSTRACT

Background: The prevalence of non-communicable disease like Type 2 diabetes mellitus is increasing among woman. The study is aimed at investigating the prevalence of Type 2 Diabetes Mellitus and their associated risk factors among woman, in Jeddah. **Objective: To d**etermine the prevalence of risk factors of diabetes mellitus (DM) among Saudi women in Jeddah. **Method:** A cross-sectional study was conducted in Jeddah from January 2017 to April 2017 at king Abdelaziz University. where the questionnaire was distributed among the participants of an event that coincided in King Abdelaziz University. The survey was based on the diabetes risk test score adapted from Bang et al., 2009; relaying on: age, body mass index (BMI), exercise every day, previous diagnosis as gestational diabetes and presence of family history of DM. These data were collected and analyzed. The risk score was calculated to the participants. Random blood glucose and HA1C were measured. **Results:** 904 participants showed that 14.9% were from 40- 49, 7.1% were from 50- 59 and 4% were equal to or above 60 years. Family history of DM was (+ve) in 68.5%, 32.2% were overweight and 24.2% were obese. 58.8% didn't do exercise. 17.3% were diagnosed as gestational diabetes. 26.1% had increased risk for having type 2 DM in upcoming 10 Y. **Conclusion:** This study producing the immediate action on Saudi women to be arrive of DM risk of its complications in near future. As it consciousness appear on healthy life style and socio-economic state.

KEYWORDS: Diabetes mellitus, diabetic risk test, King Abdelaziz's awareness program for diabetes prevention group, BMI.

INTRODUCTION

An excess in the prevalence of T2DM is spotted and is referred to the dramatic changes in lifestyle, in addition to genetic predisposition of Saudi women to diabetes and a high prevalence of consanguineous marriages.[1] A national survey in 2004 estimated that 23.7% of Saudi adults (age 30-70 years) suffered from T2DM, and another 14.1% had deteriorated fasting glucose.[2] The load of diabetes in KSA is likely to increase to disastrous levels, unless a comprehensive epidemic control program is implemented rigorously promoting healthy diet, exercise and active lifestyles, and curbing obesity.[3,4]

Family history has a major role in the cause of diabetes First-degree relatives of diabetic patients have long been known to have an increased risk of developing T2DM. Recent studies in genetic research have also identified the genetic variants linked with T2DM.[5,6] Family history of diabetes is also used as a predictor of T2DM in population-based screening programs.[7] However, roughly half of the risk of T2DM can be attributed to lifestyle, and half to genetics.

However, the International Diabetic Federation13 recommends that diabetes control programs should simultaneously promote lifestyle modification among high-risk individuals, as well as the entire population. Intake of dietary energy in excess of expenditure simply results in weight gain and increases the risk of T2DM. Physical inactivity has long been identified as a risk factor of T2DM independently of its effects on body size and dietary patterns. Physical activity of moderate to vigorous intensity and duration, decreases the risk of conversion of impaired glucose tolerance into diabetes even in the absence of significant weight loss and independently of other risk factors.[8]

Kingdom of Saudi Arabia had achieved a notable economic growth and improvement in life quality. The country enjoys high level of economic growth and development during the past three decades. The population of country had experienced remarkable change in life styles and hence increasing rate of non-communicable disease.[9] Saudi Arabia is dignifying as the seventh highest rate in the world in terms of diabetes incidence, with about 3.4 million people having been diagnosed with diabetes. The recent estimate of the disease showed that 24.4% of the adult population is suffering from DM.

A review of literature indicates that proper education and awareness program can improve the knowledge of patients and change their attitude as a large gap was found between knowledge

and attitude.[10] Obtaining information about the prevalence, risk factors of DM is the first step in formulating a preventive program for the disease. Also, there is increasing need to investigate KAP among diabetic patients to help in future development of programs and techniques for effective health education.[11]

The objectives of this study were to determine the prevalence of diabetes mellitus and its associated factors among female students to investigate their knowledge attitude and practices towards this disease.

Participants and Methods

A cross-sectional study was conducted among Saudi women in Jeddah in Saudi Arabia from January 2017 to April 2017 at king Abdelaziz University. A questionnaire was distributed among the participants of an event that coincided in king Abdelaziz University. The survey was conducted in 2 locations; king Abdelaziz University The survey was based on the diabetes risk test score adapted from Bang et al., 2009 that was developed to detect the individuals with a high probability of diabetes prevalence; age, body mass index (BMI), exercise every day and family history of DM. These data were collected and analyzed. The risk score was calculated to the participants. Random blood glucose was measured to 344 participants and HA_1C was measured to 66 participants.

Study Design and Population

The sample size was calculated based on 95% confidence level with 5% confidence interval in an unlimited population size; the result was about 385-sample size (http://www.calculator.net). Same number has been tested and documented in many literatures.

Data Collection

The data was collected by health Students with different specialty. The students used a self-administered questionnaire.

The questionnaire was ARABIC in language designed to evaluate Relative risks (RRs) associated with it as age, BMI, exercise, positive screening for increase blood sugar during pregnancy or and positive family history of diabetes. A numerical value was assigned to each of the points.

Data Management Analysis

The data entry and analysis were performed using Statistical Package for the Social Sciences Program (SPSS) 21th Edition. The overall prevalence of DM among participants was calculated with a 95% confidence interval (CI). The chi-square test (or Fisher exact test where applicable) was used to evaluate the prevalence of DM among different sub-groups. All statistical tests were two-sided and a level of $P < 0.05$ was used to indicate statistical significance.

RESULTS

A total of 904 participants showed that 74% were below 40 years old, 14.9% were from 40-49, 7.1% were from 50- 59 and 4% were equal to or above 60 years. Family history of DM was (+VE) in 68.5%,. BMI was normal in 43.4%, overweight in 32.2% and obese in 24.2%. 58.8% of the participants didn't do exercise.17.3% of them was diagnosed as gestational diabetes.

Waist circumference was normal in 4%, moderately increased in 24.9% and highly increased in 16.1%.59.2% of them didn't eat vegetable and fruits every day.

RBG was measured to 350 participants (110 ± 25.10); 311 (88.9%) were normal, 37 (10.6%) were pre-diabetics and 2 (0.5%) were diabetics.

HA_1C was measured to 64 participants (6.3±0.44); only one (0.3%) was normal, 32 (50%) were pre-diabetics and 31 (48.8%) were diabetics.

BMI was measured to 311 participants (26.4± 7.17); 26 (8.4%) were underweight, 118 (37.9%) were normal and 79 (25.4%) were overweight and 88 (28.3%) were obese.

There were positive correlations between BMI (0.37; $P<0.01$) and RBG (0.19; $P<0.01$) and HA1C (0.53; $P<0.01$).

Table (1): The percentage of risk factors among the participants.

Parameters	No.	%
No family hist.	286	31.5
Family history	618	68.5
Age		
< 40	669	74
1: 40- 49	135	14.9
2: 50- 59	64	7.1
3 ≥ 60	36	4
BMI		
Normal	394	43.4
1:Overweight	291	32.2
2 &3:obese	219	24.2
Exercise		
Yes	372	41.2
No	530	58.8
Diagnosis for GDM		
Yes	110	17.3
No	525	82.7

Table (2): The risk of type 2 diabetes mellitus among the Studied normal Population.

Parameters	No.	%
No Risk	668	73.9
Risk	236	26.1

Table (3): Random blood glucose, HA1C and Body mass index.

Parameters	No.	Mean± SEM
Random Blood Glucose	347	110.8± 1.80
HA1C	66	6.2±.05
Body Mass Index (BMI)	269	27±0.48

DISCUSSION

In this study out of 904 participants recorded was found that 559 where all the parameters were completed, 26.1% of them were high risk group to have DM according to ADA score for the upcoming 10 years. 68.5% had positive family history of DM. A study published in 1996 confirmed this results regarding genetic factors as it stated that the risk factor for type 2 DM is a strong family history.[14] Type 2 DM has a stronger link to family history and lineage than type 1, although it is very much influenced by environmental factors.

As documented in this study, 26% of the participants were above 40 years old which is in agreement as was mentioned in UK research from 1999-2002, that rising prevalence of DM for males in age group 25-70 years or older.[15] It was declared by same researchers that getting elderly increases DM prevalence. As expected by 2030 the age in range of 45- 64

years in developing countries, will suffer from DM. In upcoming 15years, it is estimated that the number of diabetics who are older than 64 years will be more than82 million in developing countries and more than 48 million in developed countries.[16] DM was projected to affect Asian Indians most among all others in the world by 2030.[17] Another study, conducted in Saudi Arabia and published in 2004, also confirmed this result regarding age and its relationship with DM.[18]

The current study showed that 32.2% were overweight and 24.2% were obese, which is considered a modifiable risk factor to avoid DM. In USA, one study found that overweight and obesity were significantly associated with DM.[19] In 2006 a study on National Prevalence of DM has shown that a relative risk for DM is obesity measured by BMI & waist hip ratio in women.[20] A study published in 2005 may explain the rise of prevalence of DM in those that eat fast-food in a study published in 2013 in KSA. DM also influenced by Lifestyle. Because of resembling eating and exercise habits, obesity spread in families, and that is why environmental factor play a major role. American 's family history of DM has a momentous, unrestricted and ranked association with the prevalence of diabetes. This relationship not only spotlights the prominent status of shared genes and environment in DM however opens the hypothesis of officially adding family history to public health policies targeted to detect as well as preventing DM.[21]

The current study showed that 58.8% of the participants didn't do exercise, 18.3% of them had hypertension and 17.3% of them was diagnosed as gestational diabetes. Random blood glucose was estimated to 347 samples (111±1.8) and 2.5% was above 200mg% & HA_1C was > 6.5% in 48.5% of the 66 estimated samples which diagnose DM according to ADA GUIDELINE 2016 which mean undiagnosed DM with similar findings in China population stated that the proportion of undiagnosed DM was 70.5% and 58% in rural and urban areas, respectively.[22] Delayed diagnosis and/or improper medications at presentation make them prone to develop diabetes related complications with high morbidity and mortality.

Thus, family history, age and obesity remained to be most substantial hazard for DM among the participants in this study. If the current trend could not be checked, Saudi women will have an outside estimate number of diabetics by 2030. Therefore, the need of the today is to take crucial preventive measures like life style modification, reduction of body weight, increasing physical activity and planned urbanization.

CONCLUSION

This study producing the immediate action on Saudi women to be arrive of DM risk of its complications in near future. As it consciousness appear on healthy life style and socio-economic state.

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