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A Study on the Prevalence of Obesity in Type II Diabetes Mellitus among Female Adults Aged 20-50 Years Attending Abha and Khamis Mushayat Diabetic Centres in Saudi Arabia

Research Article

Sachithananthan V*

Faculty of Public health, College of Applied Medical Sciences, King Khalid University, Abha, Saudi Arabia.

Abstract

Background: A sedentary lifestyle and prevalence of obesity are the key factors which lead to an increasing prevalence of Type II diabetes mellitus. There is strong evidence that modifiable risk factors such as obesity and physical inactivity are the main non-genetic determinants of the disease and could be modified.
Objectives: To determine the prevalence of obesity (≥ 30 BMI - body mass index) among the selected subjects.
Subjects and Methods: A cross sectional study was adopted. Around 1000 female subjects aged 30-50 years, with Type II diabetes mellitus were selected randomly from Abha and Khamis Mushayat Diabetic care centers. The data were collected by questionnaire which included background information. Other physiological, biochemical and anthropometric parameters were measured using standard procedures. The statistical analysis was done on SPSS 20 platform.
Results: The socioeconomic background did not correlate with BMI and other selected anthropometric (waist and hip circumference) and biochemical parameters such as fasting and random blood sugar levels. With regards to the BMI status of the subjects, a majority of the subjects were in Grade I (31.1%) and Grade II (29.8%) obesity ranges indicating high prevalence rate of obesity in the diabetes mellitus subjects. Around 8.6% of the subjects had morbid obesity (≥ 40 BMI). Totally the prevalence of obesity in the present study in type II diabetes mellitus subjects was 69.5%.
Conclusion: Stressing on the importance of a balanced low glycemic diet and adequate physical activity through regular counseling of the diabetes subjects, to treat and prevent obesity is the need of the hour.

Keywords: Type II Diabetes Mellitus; Obesity; BMI; Blood Glucose Levels.

Introduction

Type II diabetes mellitus, formerly known as non-insulin dependent diabetes mellitus or adult onset diabetes is a metabolic disorder that results in hyperglycemia due to the body being ineffective at using the insulin it has produced, also known as insulin resistance and or being unable to produce enough insulin. In recent years, it has become apparent that many people with type II diabetes are able to manage diabetes through methods including physical activity and low carbohydrate diets, which means very low calorie diets and exercise [1].

A sedentary lifestyle and prevalence of obesity which are the main non-genetic determinants of the disease are the key factors which lead to an increasing prevalence of Type II diabetes mellitus. An interaction between a genetic predisposition and behavior and environmental factors leads to Type II diabetic mellitus [2].

In Saudi Arabia, 25.5% of the urban population is diabetic in comparison with 19.5% in rural areas. There are also regional differences in the prevalence of type II diabetes, with the Northern (27.9%) and Eastern (26.4%) provinces experiencing greater rates than the Southern region (18.2%), where a rural lifestyle is more common [3] and the population less prone to obesity than those on the Northern and Eastern provinces [4].

An attempt has been made in this study to determine the prevalence of obesity (≥ 30 BMI - body mass index) among the selected type II diabetes mellitus subjects.

***Corresponding Author**:
Vedavalli Sachithananthan,
Faculty of Public health, College of Applied Medical Sciences, King Khalid University, Abha, Saudi Arabia.
Tel: 00966 553243155
E-mail: dr_vedavalli@yahoo.com

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Materials and Methods

1000 female subjects with type II diabetes mellitus were selected randomly for the study in the age group of 30-50 years from the Diabetic centres in Abha and Khamis Mushayat cities. An interview was conducted to collect the required socio economic background data. Also height and weight were measured to calculate the BMI (Body mass index). Waist and hip circumferences and fasting and random blood sugar levels were measured by standard procedures. The collected data were coded and uploaded on SPSS 20 for analysis.

Results

Family Background of the Selected Subjects

The socio economic background of the selected subjects is presented in the following tables:

Table 1. Area of residence of the selected subjects.

		Valid Percent
Valid	Khamis Mushayat	49.7
	Abha	50.3
	Total	100

Almost an equal number of subjects (around 50%) were selected from Abha and Khamis Mushayat Diabetic centres in Saudi Arabia, due to ease of accessibility.

Table 2. Education of the study subjects.

		Valid Percent
Valid	No	53.6
	Yes	46.4
	Total	100

A majority of the subjects were not educated (53.6%), whereas the remaining 46.4% were educated.

Table 3. Occupation of the study subjects.

		Valid Percent
Valid	no	33.1
	yes	66.9
	Total	100

A majority of the subjects did not have an occupation (86.1%), whereas the remaining 13.9% had an occupation.

Table 4. Members of the family and ancestors if diabetic.

		Percent	Valid Percent	Cumulative Percent
Valid	No	33.1	33.1	33.1
	Yes	66.9	66.9	100.00
	Total	100.00	100.00	

A majority of the family members and ancestors had diabetes (66.9%), whereas the remaining 33.1% were not diabetic.

BMI Status of the Study Subjects

Table 5. BMI status of the study subjects.

		Valid Percent
Valid	Normal weight	5.3
	Overweight	25.2
	Grade 1 obesity	31.1
	Grade 2 obesity	29.8
	morbid obesity	8.6
	Total	100.00

A majority of the study subjects were in Grade I obesity (31.1%-BMI=30-34.9) and Grade II (29.8% - BMI = 35 -39.9) categories. Twenty-five percent of the subjects were overweight (25-29.9

Figure 1. BMI Status of the Study Subjects.

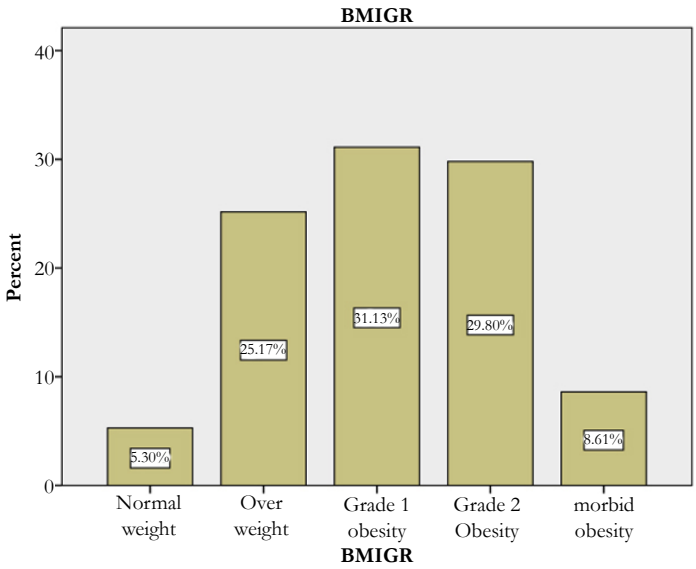

Table 6. Other anthropometric and biochemical parameters of the selected subjects.

Parameters	Minimum	Maximum	Mean	Std. Deviation
Height (cm)	140.00	170.00	156.8146	5.00720
Weight (kg)	55.00	115.00	81.3974	13.04713
Waist circumference (cm)	77.00	140.00	103.8675	13.58267
Hip circumference (cm)	85.00	150.00	115.4437	12.36535
Fasting blood sugar (mg/dl)	70.00	305.00	137.2185	48.85132
Random blood sugar (mg/dl)	100.00	460.00	251.4172	89.92837

BMI). Only 5.3% of the subjects were of normal weight BMI. Around 8.6% of the subjects had morbid obesity (≥ 40 BMI). Totally the prevalence of obesity in type II diabetic mellitus subjects was 69.5%.

Other Anthropometric and Biochemical Parameters

The mean of all the above parameters such as mean BMI (33), waist circumference (103.86cm), hip circumference (115.44cm), were well above the standards thus indicating obesity and central obesity. Also fasting (137.2mg/dl) and random (251.42mg/dl) blood sugar levels were also well above the diagnostic criteria for diabetes mellitus. Hence it can be stated that the subjects did not have controlled blood sugar levels. The complications of diabetes mellitus will set in, if hyperglycemia is not controlled. Also the central obesity parameters show the prevalence of central obesity to be very high in type II diabetes mellitus patients which prones towards more severe complications.

Discussion

The socioeconomic background did not correlate with the BMI and other selected anthropometric (waist and hip circumference) and biochemical parameters such as fasting and random blood sugar levels. This may be due to the fact that the subjects were already diabetic and suffering from severe hyperglycemia.

With regards to the BMI status of the subjects, a majority of the subjects were in the Grade II and Grade I obesity range indicating high prevalence rate of obesity in the diabetes mellitus subjects. Totally the prevalence of obesity in the present study in type II diabetes mellitus subjects was 69.5%. This is somewhat higher than the prevalence of obesity in adults, adolescents, and children in the Middle Eastern/North African region, which is amongst the highest worldwide ranging between 2%–55% in adult females and 1%–30% in adult males while the prevalence in adolescents and children range from 5%-14% [5]. An estimate from the National Center for Health Statistics (NHANES III) reported that 78.5% of diabetics were overweight, and 45.7% were obese [6].

This scenario has to be managed both by the subjects and the dietitians,' because uncontrolled type II diabetes mellitus may lead to severe complications and early death. In order to fight this disease, efforts from the dietitians, physicians and family members should be towards counseling the patients on the importance of maintaining normal weight and having good physical activity during the day, in addition to exercise and diet.

Conclusion

With regards to the BMI status of the subjects, a majority of the subjects were in the Grade II and Grade I obesity range indicating high prevalence rate of obesity in the diabetes mellitus subjects. Steps should be taken by the dietitians' by constant counseling to prevent and eradicate obesity and thereby reduce the severity and complications of type II diabetes mellitus in the long run.

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