Prevalence of Glycemic Status, Obesity & Waist Circumference in Punjabi Type 2 Diabetics

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Abstract

Aim-To observe the prevalence of glycemic status, obesity and waist circumference in Punjabi male Type 2 Diabetics. **Materials & Methods-**Two hundred forty type 2 diabetics Punjabi males with age ranging from 30 to 70 years volunteered to participate in this study as subjects. The glycemic status (fasting blood sugar & glycated haemoglobin, HbA1c), obesity (BMI) & waist circumference (WC) were recorded with standard procedures. WHO criteria determined BMI and WC categories. The statistical analysis was done by using SPSS version 16.0 and the level of significance was <.05. **Results-**The mean age, height, weight, fasting blood sugar (FBS), glycated haemoglobin (HbA1c), body mass index (BMI) and waist circumference (WC) of studied type 2 diabetics were 50.75±11.4 years, 166.69±7.6cm, 75.88±11.8Kg, 146.37±28.6 (mg/dl), 7.34±1.2 (%), 27.29±3.6 and 102.82±8.0 (cm) respectively. Based on fasting blood sugar, 10.4% studied type 2 diabetics had normoglycemia (FBS≤120mg/dl), 89.6% were hyperglycemia (FBS≥120mg/dl). Based on glycated haemoglobin (HbA1c), 25.4% studied type 2 diabetics had good control of blood sugar (HbA1c≤6.5), 30.4% were average control (HbA1c 6.5-7.5), 26.7% were poor control (HbA1c 7.5-8.5) and 17.5% were morbid control. Based on BMI, 26.7%, study type 2 diabetics were normal, 55% wer overweight, 14.5% was obese Class I, 3% were Obese Class II and 1.8% were Obese Class III. Based on waist circumference of the sample population of type 2 diabetics 10.9% were obese, 24.1% had increased risk for metabolic syndrome [action level I (WC ≥ 94cm)] and 61.7% had substantially increased risk [action level II (WC ≥102cm)]. **Conclusion-**it was concluded that prevalence of poor glycemic control and obesity exist but obesity and overweight were more prevalent in Punjabi Type 2 diabetics.

Keywords: FBS, HbA1c, BMI.

Introduction

Diabetes mellitus is a chronic metabolic condition characterised by persistent hyperglycaemia with resultant morbidity and mortality related primarily to its associated complications. Despite the association of obesity with poorer glycemic control and cardiovascular morbidity and mortality less attention has been given to its management relative to the attainment of glycemic targets. The diabetes mellitus is becoming more and more prevalent in Indian society. In India, it is estimated that approximately 2% of the population, 15 million people have diabetes *(Swami, 1984)*. The number of cases is said to be rising by 5%-6% each year and an estimated 300,000 people die from diabetes and its related complications *(Herman et al., 1984)*. There are about 3.5 crore diabetics in India and the figure will rise to about 5.2 crores by 2025. Every 5th patient visiting a consulting physician is a diabetic, and, every 7th patient visiting a family physician is a diabetic. Keeping in view the alarming increase in the incidence and prevalence of diabetics in India, WHO has declared

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India as the "Diabetic Capital of the World" *(Vijay, 2002)*. Thus the management of diabetes is a big challenge for health professionals. The quality of life of diabetics decrease, resulting in a decline in one's ability to give best to the society and also increase in health-care cost. The aim of the present research work was to observe the prevalence of glycemic status, obesity & waist circumference of Punjabi type 2 diabetics.

Materials and Methods

Two hundred forty type 2 diabetics Punjabi male with an age ranging from 30 to 70 years volunteered to participate in this study as subjects. The glycemic status (fasting blood sugar & glycated haemoglobin, HbA1c), obesity (BMI) & waist circumference (WC) were recorded with standard procedure. WHO criteria determined BMI and WC categories. The statistical analysis was done by using SPSS version 16.0 and the level of significance was $<.05$.

Results

The mean age, height, weight, fasting blood sugar (FBS), glycated haemoglobin (HbA_1c), body mass index (BMI) and waist circumference (WC) of studied type 2 diabetics were 50.75 ± 11.4 years, 166.69 ± 7.6cm, 75.88 ± 11.8Kg, 146.37 ± 28.6 (mg/dl), 7.34 ± 1.2 (%), 27.29 ± 3.6 and 102.82 ± 8.0 (cm) respectively (Table 1).

Table 1: Descriptive Statistics of Punjabi Type 2 Diabetics

Variables	
Age (years)	50.75 ± 11.4
Height (cm)	166.69 ± 7.6
Weight(kg)	75.88 ± 11.8
FBS (mg/dl)	146.37 ± 28.6
HbA1C (%)	7.34 ± 1.2
Body Mass index, BMI	27.29 ± 3.6
Waist Circumference (cm)	102.82 ± 8.0

Based on fasting blood sugar, 10.4% studied type 2 diabetics had normoglycemia (FBS≤120mg/dl), 89.6% were having hyperglycemia (FBS≥120mg/dl) (Table 2).

Table 2: Percentage Distribution of Type 2 Diabetics on the basis of Fasting Blood Sugar

Fasting Blood Sugar category	
Up to 120 (mg/dl)	10.4% (25)
120 to 150 (mg/dl)	55% (132)
151 to 180 (mg/dl)	27.1% (65)
Above 180 (mg/dl)	7.5% (18)

Based on glycated haemoglobin (HbA1c), 25.4% studied type 2 diabetics had good control of blood sugar (HbA1c≤6.5), 30.4% were having average control (HbA1c 6.5-7.5), 26.7% were having poor control (HbA1c 7.5-8.5) and 17.5% demonstrated morbid control (Table 3).

Table 3: Percentage Distribution of Type 2 Diabetics on the basis of HbA1c

HbA1c category	
<6.5	25.4% (61)
6.5-7.5	30.4%(73)
7.5-8.5	26.7%(64)
>8.5	17.5%(42)

Based on BMI, 26.7%, study type 2 diabetics were normal, 55% were overweight, 14.5% were obese Class I, 3% were Obese Class II and 1.8% were Obese Class III (Table 4).

Table 4: Percentage Distribution of Type 2 Diabetics on the basis of BMI

BMI Category	BMI range,kg/ m^2	
Normal	18.5 to 24.9	26.7% (66)
Overweight	25 to 29.9	55%(130)
Obese Class I	30 to 34.9	14.5%(35)
Obese Class II	35 to 39.9	3%(7)
Obese Class III	over 40	1.8%(2)

Based on waist circumference of the sample population of type 2 diabetics 10.9% were obese, 24.1% had increased risk for metabolic syndrome [action level I (WC≥94cm)] and 61.7% had substantially

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increased risk [action level II (WC $\geq$102cm)] (Table 5).

Table 5: Percentage Distribution of Type 2 Diabetics on the basis of Waist Circumference

Waist circumference category	
<90cm	3.3% (8)
≥90cm	10.9% (26)
≥94cm (action level I)	24.1% (58)
≥102cm (action level II)	61.7% (148)

The glycated haemoglobin (HbA$_1$c) was highly significantly and positively related with fasting blood sugar (r=0.70 p<.01) of type 2 diabetics in the studied sample. Similarly, the waist circumference was also significantly positively related with body weight (r=0.62 p<.01) and body mass index (r=0.46 p<.01) (Table 6).

Table 6: Correlation (Pearson's) among Glycemic and Obesity variables

Variables	FBS	HbA1c	BMI	Waist Circumference
Weight	-.04	-.01	.80**	.62**
FBS	-	.70**	-.05	-.10
HbA1c		-	-.01	-.10
BMI			-	.46**

* significant at 0.05 level; **significant at 0.01 level

The high prevalence of obesity in this population of diabetes suggests that structured weight reduction should be an integral part of attainment of glycemic targets.

Discussion

The results shows that overweight and obesity is common in the Punjabi type 2 diabetes patients. Obesity is a major potentially modifiable risk factor for type 2 diabetes *(Pinkney, 2002)*. This is similar to the association between obesity and diabetes shown in other studies *(Kumar et al., 2008 and Daoust et al., 2006)*. The percentage of patients with central obesity (abdomen) was higher than those with general obesity indicating that early detection and control of central obesity might be more important in Asian population. There is an indication of waist circumference being an important indicator of progression to diabetes *(Gautier et al., 2010)*. It is associated with poorer control of blood glucose levels, blood pressure and cholesterol, placing persons with diabetes at higher risk for both cardiovascular and microvascular disease. While studies have well established the strong epidemiological association between obesity and development of diabetes *(UKPDS, 1988)*, little attention has been paid to the significance of obesity in Punjabi population with diabetes. This is important because of the fact that obesity is an independent risk factor for cardiovascular disease *(Rimm et al., 1995)*, an effect likely to be mediated, at least in part through its known associations with the metabolic syndrome. Clinical evidence suggests that the association of diabetes with central obesity is stronger than the association with general fat *(Vazquez et al., 2007)*. Waist circumference has been used as measures of central obesity and body mass index has been used as a measure of general obesity. Studies have indicated that central obesity might be more important in the Indian population *(Kumar et al., 2008 and Daoust et al., 2006)*. Central obesity has been associated with decreased glucose tolerance, alterations in glucose insulin homeostasis, reduced metabolic clearance of insulin, and decreased insulin-stimulated glucose disposal *(Vazquez et al., 2007)*. About 55% of the patients in our sample are overweight as per the revised guidelines for the measurement of obesity (by using

BMI) for Asian population *(WHO Expert Consultation 2004)*. Also, increased waist circumference was more common. To conclude, our study showed that obesity is common in type 2 diabetics. Central obesity is significantly more common in our population. Both general and central obesity is more common. It is known that weight loss in overweight patients with type 2 diabetes rapidly reverses the state of insulin resistance and can restore normal blood glucose concentrations *(Henry et al., 2004)*. A variety of intervention studies show that patients with type 2 diabetes who succeed in losing weight often enjoy modest improvements in glycemic control and cardiovascular risk profiles, as long as the weight loss is maintained *(Williamson et al., 2000)*.

Conclusion: The results of this study revealed that prevalence of poor glycemic control and obesity exist but obesity (abdominal) and overweight were more prevalent in Punjabi Type 2 diabetics. Therefore, efforts should be made to control this in type 2 diabetics for their well being and possibly to avoid the risk of disease like cardiovascular later in life.

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