P-0861-The Relationship between Different Measures of Obesity to Impaired Glucose Tolerance in Adult Non- Diabetic Saudis

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Introduction

Overweight and obesity is considered a major risk factor for impaired glucose tolerance (IGT) or prediabetes.(1, 2) There are different measures of obesity, some of which reflect general obesity such as body mass index (BMI), and percentage of fat (% fat), while some reflect abdominal obesity such as waist circumference (WC), waist: hip ratio (WC:HC), waist: height ratio (WC:Hgt), or upper torso obesity such as neck circumference (NC)(3, 4). Abdominal obesity was suggested to be the best predictor of IGT in various populations of different ethnicities(5, 6). However, this was not investigated in the Saudi population, and only weight is routinely measured in out-patients clinics.

Aim: To investigate the relationship between different measures of obesity (BMI, % fat, WC, WC:HC, WC: Hgt, NC) and IGT in order to find the strongest predictor of prediabetes in adult non- diabetic Saudis.

Methods

A cross-sectional study was conducted in 9 primary health care centers in Jeddah. A predesigned questionnaire was used to collect demographic information. Anthropometric measurements were taken. Venous blood samples were taken while fasting, and 1 hour following the ingestion of 50g of glucose solution, and used to estimate plasma glucose, and HbA1C. A fasting glucose value of <5.6 mmol/L was considered normal, while ≥ 5.6 mmol/L, and/or one hour glucose value of > 7.8 - 11.1 mmol/L indicated IGT, and fasting glucose value ≥ 7.0 mmol/L, and/or one hour glucose value of > 11.1 mmol/L suggested the presence of diabetes, with HbA1c $\geq 6.5\%$ confirming the diagnosis. Characteristics of the two resulting groups were compared, and multiple logistic regression with IGT as the dependent variable was used to evaluate the measures of obesity most significantly associated with IGT.

Results

Our study included 647 participants, 344 (53.1%) were females . The mean $\pm$ SD for age was 32.2 $\pm$ (11.9). Regarding obesity measures, the mean $\pm$ SD for NC was 35.8 $\pm$ 5.8,for WC was 91.7 $\pm$ 16.9 and for WC:Hgt was 0.56 $\pm$ 0.1.In this study almost 60% (388) of participants were either overweight or obese. Among our participants 174(27%)were prediabetic .Analysis by Independent Sample t test revealed several significant association between prediabetes and obesity (Figure1 & 2).

Figure 1: The association between age, obesity measures and prediabetes Univariate analysis

However, during logistic regression most of significant association becomes insignificant. We found that the most important predictors was (WC:Hgt) ,participants with higher ratio were more likely to have pre-diabetes (Adjusted OR=2.6; 95%CI: 1.203-57.125) . In addition, age was also a significant predictors (Adjusted OR=1.043; 95%CI: 1.024-1.063) as seen in Table 1

Figure 2: The association between ratios of (WC:HC & WC:Hgt) and prediabetes Univariate analysis

Table 2: Predictors of prediabetes among Saudi: Multivariate logistic regression analysis

	β	S.E	A OR	95 % C.I. for Adjusted OR		P-value
				Lower	Upper	
Percentage of fat (% fat)	-0.010	0.018	0.990	0.956	1.026	0.585
Neck circumference (NC)	0.012	0.021	1.012	0.972	1.055	0.556
Waist circumference (WC)	-0.039	0.026	0.962	0.913	1.013	0.139
Waist: Height ratio (WC:Hgt),	12.477	4.302	2.622	1.203	57.125	0.004
Body mass index (BMI),	-0.299	0.215	0.742	0.487	1.130	0.165
Waist: Hip ratio (WC:HC)	-1.358	0.927	0.257	0.042	1.583	0.143
Age	0.042	.009	1.043	1.024	1.063	0.000

β :slop S.E: Standard Error AOR: Adjusted Odds Ratio C.I: Confidence Interval

Discussion

The prevalence of prediabetes and obesity among Saudi in Jeddah were high (27%, and 60%). All obesity measures were associated with prediabetes but the most significant predictors was WC:Hgt (OR=2.6) (7). Waist circumference alone does not give enough risk without taking in consideration the participant's height.(8) However ,this may lead to more hypothesis regarding the importance of Waist circumference as a risk factors does it have a role as a single predictors or it can act as a risk modifier . Future work will help to clarify this matter.

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