ABDOMINAL OBESITY AS MEASURED BY WAIST CIRCUMFERRENCE AMONG POPULATION OF DISTRICT PESHAWAR

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ABSTRACT

Background: Obesity is defined as a condition of abnormal or excessive fat accumulation in the adipose tissue of the body. Increased body weight is a major risk factor for the metabolic syndrome which is an important cluster of coronary heart disease risk factors. Objective: The objective of the instant study was to determine the frequency of abdominal obesity as measured by waist circumference in the population of Peshawar district. Methods: This descriptive cross sectional study was carried out among the population of district Peshawar, KPK. All participants were interviewed in detail. Waist circumference (≥ 102 cm in male and ≥ 88 cm in females) was used as the surrogate marker for abdominal obesity. Results: A total of 3726 individuals were included, 61.94% were male. Mean age was 39.38 ± 14.90 years. Mean waist circumference was 91.82 ± 12.50 cm in males and 93.56 ± 14.40 cm in females. Conclusion: Abdominal obesity is more common amongst female than male population of Peshawar District and waist circumference is a good anthropometric measure of abdominal obesity.

Key Words: Waist Circumference, Abdominal Obesity, Peshawar.

INTRODUCTION

Obesity is defined as a condition of abnormal or excessive fat accumulation in the adipose tissue of the body.[1] Worldwide, in both developed and developing countries, the prevalence of obesity has reached an epidemic level.[2-3] Waist circumference (WC) is considered a good anthropometric alternative for assessing abdominal adiposity. WC is an aggregate measurement of the actual amount of total and abdominal fat accumulation and is a crucial correlate of metabolic syndromes found amongst obese and overweight patients.[4-5] The National Cholesterol Education Program Adult Treatment Panel III recommended WC cut-off levels to define abdominal obesity as ≥ 102 cm for men and ≥ 88 cm for women.[4,6]

Increased body weight is a major risk factor for the metabolic syndrome which is an important cluster of coronary heart disease risk factors, like: hypertension, diabetes mellitus, and dyslipidemia.[6-8] Many studies have demonstrated that individuals with metabolic syndrome are at high risk for subsequent development of Type-2 diabetes mellitus (T2DM).[9-10] T2DM is strongly associated with overweight and obesity.[11-13] Positive correlation between BMI, glucose, lipids and blood

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pressure have been previously reported.[14-16]

The aim of this study was to determine the frequency of abdominal obesity as measured by waist circumference in population of District Peshawar, KPK.

MATERIAL AND METHODS

This was a cross sectional study, carried in Peshawar district, launched with an aim to find out frequency of abdominal obesity measured by waist circumference among the people of district Peshawar, KPK, Pakistan. The field work of data gathering was performed by the team of expert from department of Medicine, Peshawar Institute of Medical Sciences, Peshawar KPK and Department of Biochemistry, Khyber Medical College, Peshawar, KPK, Pakistan. Sample size of this study was calculated as 3726. Adult individuals of 18 or above years, any professions, any gender and any socioeconomic class were selected by convenient sampling technique. Afghan refugees were excluded from this study.

Informed written consent was taken from all of the examinees and were interviewed by one of the trained surveyors, using a well-defined questionnaire. The questionnaire was designed for collecting extensive information on personal data (name, gender, weight, height, marital status, occupation and various life style variables including exercise, smoking etc.), current and past medical history and drug use. Blood pressure was measured on both arms in sitting position and the average was recorded. Waist circumference was determined in centimetre (cm) with measuring tape. Data was analysed using SPSS-20 version.

RESULTS

A total of n=3726 apparently normal healthy

individuals was recruited on the basis of pre-defined selection criteria from the population of Peshawar, KPK, in the present study. Baseline characteristic are shown in Table 1. Mean age was 39.38±14.90 years. Majority of study population were male n=2308 (61.94%). Mean waist circumference in male was 91.82±12.50 cm while in female it was 93.56±14.40 cm. Out of total study population, abdominal obese were n=2080 (55.82%) and non-abdominal obese were n=1646 (44.17%). Amongst the study population obese male were n=728 (31.54%) and females having abdominal obesity were n=727 (51.26%). Only 590 (15.83%) of the study population were smokers and they all were males, while majority of them n=3054 (81.99%) were non-smokers. In the present study 1398 (37.52%) subject were performing exercises (Table 1). A highly significant change (p<0.001) was observed for serum total cholesterol and blood urea of males when compared with females (Table 2). Similarly significant changes (p<0.04) were noted for blood sugar and triglycerides in males when compared with females. However non-significant change was observed for serum creatinine. Similarly significant changes (p<0.032) were noted when obese where compared with non-obese subjects (Table 3).

DISCUSSION

Obesity is an independent risk factor for cardiovascular diseases and it is known to be associated with other risk factors such as hypertension, diabetes mellitus and dyslipidaemia. We considered waist circumference which is a good anthropometric indicator for abdominal obesity because it is an aggregate mea-

Table 1: Baseline Characteristics of Study Population

Baseline Characteristics	Frequencies	P-value
Study Sample	**3726**	
Means±SD Age (years)	39.38±14.90	
Gender		
Males	2308 (61.94%)	—
Females	1418 (38.06%)	
Means±SD Waist (cm)	92.69±13.45	
Males	91.82±12.50	0.002
Females	93.56±14.40	
Overall BMI (Kg/m²)	28.74±6.80	—
Means±SD Systolic BP (mmHg)	123.89±17.95	—
Means±SD Diastolic BP (mmHg)	80.41±11.06	—
Means±SD working hours per day	07.34±03.21	—
Abdominal Obesity		
Males	728 (31.54%)	0.0001
Females	727 (51.26%)	
Physical Activity (Exercise Performed)	1398 (37.52%)	—
Smoking Habit		
Current Smoker	0590 (15.83%)	
Ex-smoker	0082 (02.20%)	—
Non-smoker	3054 (81.96%)	

Table 2: Frequency of Biochemical Parameters in Study Population

Biochem. Parameters	Males (n=2308)	Females (n=1418)	Total (n=3726)	P value
Glucose (mg/dL)	98.52±10.65	116.71±17.90	107.61±14.27	<0.04
T. Cholesterol (mg/dL)	145.67±17.34	161.19±21.93	153.43±19.63	<0.001
Triglycerides (mg/dL)	153.36±11.39	167.54±18.74	160.90±14.89	<0.005
Blood Urea (mg/dL)	29.96±07.32	18.23±06.10	024.09±06.71	<0.002
S. Creatinine (mg/dL)	0.92±00.45	0.61±00.20	0.77±07.32	<0.431

Table 3: Gender wise frequency of abdominal obesity

Gender	Obese	Non-obese	P-value
Males	728 (31.54%)	1580(68.46%)	0.032
Females	727 (51.26%)	691 (48.73%)	0.051

surement of the actual amount of total and abdominal fat accumulation.

We found that more than half of our study population was having abdominal obesity. The abdominal obesity was present in 55.82% of our subjects but 38% was reported by Zaher ZMM et al (2009).[4] The reason might be that majority of our study population (62.48%) was performing no exercise. The gender distribution of abdominal obesity in our study population was 31.54% versus 51.26% in male and female respectively. Tariq M and co-workers (2010)[7] reported 27.9% male and 51.90% female as obese. The male predominance in our study is because of the larger portion of our study population constituted by males, i.e., 62.00%. The reason might be male dominated study sample in a community, in contrast to Tariq M and cowerkers[7] study, which was hospital based.

In this study, we observed that the mean waist circumference was 92.69±13.45 cm, while Heydari ST and colleagues (2010)[6] documented the mean waist circumference as 82.9±11.2 cm. The reason for less waist circumference in study by Heydari ST and colleagues[6] was that the study population was military personals with active life style as compared to our study population performing no exercises (62.48%) and having sedentary lifestyle. A weakness of our study was that we could not collect a random sample due to multiple reasons that could have affected the representativeness of our study. It is further suggested that studies on larger scales should be conducted to address such an important issue.

CONCLUSION

Abdominal obesity is more common in the population of Peshawar district; and waist circumference is a good anthropometric measure of abdominal obesity.

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