RELATIONSHIP OF NECK CIRCUMFERENCE TO SOME CARDIOMETABOLIC RISK PARAMETERS: A CROSS-SECTIONAL STUDY AMONG OBESE ADULT EGYPTIAN

Nagwa Amr Lachine, Mohamed Hassan Zeitoun, Reem Mahmoud Fathalla Elsayed, Mona Moustafa Tahoun, *Mohamed Magbell Abdallah Badbess

Department of Internal Medicine Department, Department of Chemical Pathology,* Faculty of Medicine Alexandria University, Egypt

Introduction

Egypt Demographic and Health Survey stated that 33 % of men aged 55- 59 and 65 % of women aged 45-59 were classified as obese. Obesity is defined as an excessive accumulation of body fat or weight that exceeds the age- and gender-specific reference limits.

Obesity is widely correlated with cardiometabolic risk and is strongly associated with diabetes, dyslipidemia, and hypertension. 5. There are many approaches for assessing obesity.

Some anthropometric measurements such as body mass index (BMI), waist circumference (WC) and waist: hip ratio, are commonly used at primary care centers, while other measurements, such as CT scan, MRI and DEXA scan are costly and largely used for research purposes.

Waist circumference, as an index of central obesity, may be better for predicting obesity-related health risks than BMI. Nevertheless, WC measurements may be inconvenient or difficult to obtain in some situations, such as with severely obese subjects. In addition, WC measurements are affected by postprandial distension, abdominal gases, ascites or pregnancy. Moreover, respiratory movement and thick clothing can also affect the accuracy of WC measurements, WC requires removal of the clothes which may be inconvenient in some situations.

Recently, researchers have greatly focused on neck circumference (NC), a parameter of upper-body adiposity. Upper-body subcutaneous adipose tissue may confer additional risk for metabolic disorders beyond overall and abdominal obesityNeck circumference is easy to perform, quick, reliable, and inexpensive. Its measurement is convenient and not affected by the aforementioned factors that influence WC measurement and can be particularly useful in specific populations such as morbidly obese people, patients in bed rest and pregnant women. NC could be measured without requirement for cloth removal.

Subjects and Methods

- This cross-sectional study was carried out on 100 apparently healthy obese adult Egyptian subjects (BMI ≥ 30 kg/m2), above the age of 18 years, 50% of them were males and the other 50% were females.
- All participants were subjected to full history and physical examination.
- NC, WC and BMI were measured according to standard protocol and blood samples of total cholesterol, HBA1c,HDL-C,non HDL-C and high sensitive CRP were taken.

Aim of the work

The aim of the present work is to study the relationship of neck circumference to some cardio metabolic risk parameters in obese adult Egyptians.

Results

Table 1: Comparison between male and female according to Neck circumference (cm).

Anthropometric measurement	Total (n = 100)		Sex				Test of Sig.	P
			Male (n = 50)		Female (n = 50)			
	No.	%	No.	%	No.	%		
Neck circumference (cm)								
Normal	2	2.0	2	4.0	0	0.0	χ^2= 2.041	FEp= 0.495
Abnormal (M:≥40.25, F≥37.25)	98	98.0	48	96.0	50	100.0		
Min. – Max.	38.0 – 52.0		40.0 – 52.0		38.0 – 50.0		t= 0.919	0.360
Mean ± SD.	43.38 ± 2.23		43.59 ± 2.10		43.18 ± 2.35			
Median (IQR)	44.0 (42.0 – 44.0)		44.0 (42.0 – 44.0)		44.0 (42.0 – 44.0)			

Table 2: NC and cardimetabolic parameters

Neck circumference (cm) vs.	Total (n = 100)		Male (n = 50)		Female (n = 50)	
	r	p	r	p	r	P
Age (years)	-0.046	0.652	0.048	0.739	-0.150	0.298
Systolic blood pressure (mmHg)	0.527	<0.001*	0.495	<0.001*	0.555	<0.001*
Diastolic blood pressure (mmHg)	0.430	<0.001*	0.475	<0.001*	0.383	0.006*
Waist circumference (cm)	0.538	<0.001*	0.668	<0.001*	0.499	<0.001*
Waist hip ratio	-0.153	0.130	-0.162	0.260	-0.118	0.414
BMI (kg/m^2)	0.403	<0.001*	0.455	0.001*	0.414	0.003*
HbA1c	0.085	0.400	0.067	0.642	0.099	0.493
Total cholesterol (mg/dl)	0.045	0.654	-0.121	0.403	0.229	0.109
HDL-C	-0.320	0.001*	-0.292	0.040*	-0.329	0.020*
Non HDL-C	0.004	0.972	-0.212	0.139	0.205	0.153
High sensitivity CRP	0.304	0.002*	0.357	0.011*	0.286	0.044*

Conclusions

- NC is positively correlated with WC and BMI.
- NC can be used as a tool to measure obesity especially upper trunk fat deposition and as a surrogate for WC and BMI in predicting cardiometabolic risk, as it is positively correlated with blood pressure, hs-CRP and negatively correlated with HDL-C

2021©Alexandria Faculty of Medicine
CC-BY-NC