Pattern Of Certain Anthropometric Parameters of Apparently Healthy Young Adult Nigerians: Implications For Cardiovascular Diseases And Assessment of Obesity

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ABSTRACT

The pattern of certain anthropometric parameters of the medical students at Abia State University, Uturu Nigeria were studied with a view to determining their implication for cardiovascular diseases and obesity. A total of eighty (80) medical students made up of forty-five(45) males and thirty- five females aged between 19 30 years were studied. Their waist, hip circumferences, height, body mass index (BMI) and arterial blood pressure were estimated using standard procedures. The results showed that 88.8 percent had BMI indicative of normal range; 18.7 percent were overweight while 2.5 percent had class 1 obesity. It was observed that 12.5 percent were both underweight and overweight respectively within the age range data. Students with normal weights had normal blood pressures while the overweight ones had blood pressure ranges indicating high blood pressure. It is probable that the overweight and obese students in this study could develop cardiovascular diseases and worsen obesity with a predisposition to severe heart conditions if they are not checked.

Keywords: Anthropometric parameters, body mass index (BMI), blood pressure, Waist Hip Ratio (WHR), obesity, cardiovascular diseases.

The World Heart Federation (WHR) in 2004 stated that an overweight person has a 2-6 times greater risk of developing high blood pressure, high cholesterol level and diabetes type 2. A recent study quantified an increase in obesity occurring currently in developing countries especially among women and observed that the overweight subjects exceeded the underweight by over half in the countries studied (Gill 2005; Mendez et al 2005). In Nigeria, a previous study in males related body build to serum cholesterol and body fats (Etta & Watson, 1974) while another reported on the obesity and body fat pattern in females (Adelaiye et al 1999). Massie (2002), O'Brien (2002) showed an important association between increased BMI and the risk of heart failure while Lakka et al (2002) stated that the Waist-Hip Ratio provided an additional information beyond the BMI in predicting coronary heart diseases (CHDs). Also, the significance of high blood pressure as predictor of cardiovascular diseases, morbidity and mortality has been established (Kannel, 1976). The World Health Ministers, International Obesity task Force(OTF) and International Association for the study of Obesity at the European Congress on Obesity (2004); Anyawu (2004) declared that the prevalence of

Obesity has increased by 40 per cent in majority of European countries in the past ten years which could be attributable to affluence thus contrary to low socio-economic status in most developing countries where sedentary living is factor among married obese women. Thus the aim of this study was to determine the BMI(weight, height), arterial blood pressure, waist hip ratio of apparently healthy and normotensive young adults to ascertain their predisposition to cardiovascular diseases and obesity, and whether body fats were deposited more in the waists or the hips.

MATERIALS AND METHODS
Subjects

80 medical students of Abia State University Medical School, Uturu, Nigeria made up of 45 males and 35 females aged 19-30years who were also classified into age groups according to their BMI were studied.

Selection

Subjects were selected based on no family history of high blood pressure and obesity; or not currently on any hypertensive drugs based on an administered questionnaire. Consent was sought

and obtained from the subjects as well as ethical approval obtained. The study was carried out in the Physiology laboratory between 9.00 am 12.00noon under cool and proper ventilation.

Analytical Techniques
BMI Assessment (Quentelet's Index)

An adult weighing scale was used to weigh each subject in Kg. The subject's height was taken with a standard measuring metre rule in metres. All these measurements were performed with out shoe.

The BMI or Quentelet's Index was then calculated as follows:
$BMI = $ Weight in Kg /Height in m^2 (Kg / m2)
The expected normal range is 20-25 kg / m^2 (CDC, 2005)

Waist Hip Ratio (WHR) Assessment:
Waists were measured to nearest 0.5cm at the point narrowing between the umbilicus and xiphoid. Hips were measured to the nearest 0.5cm at maximum extension of the buttocks. WHR > 0.90 (males) or 0.80 (females) indicates Abdominal Obesity; Waist circumference > 102cm(males) or 88cm (females) indicates Truncal Obesity (ATP 3)(Adult Treatment Panel III).

Blood Pressure Measurement
Arterial blood pressure was measured using an appropriate cuff with a mercury Syphygmomanometer on the left arm in the sitting position after at least 30 minutes of rest. Systoloic blood pressure(SBP)was recorded to the nearest 2mmHg at the appearance of the first Koroktoff's sound, Diastolic blood pressure(DBP) was recorded to the nearest 2mm Hg at the disappearance of the fifth Koroktoff's sound. The two measurement were performed and the mean of the two was used in the analysis. High blood pressure was defined as a SBP > 120mm Hg or a DBP > 80mm Hg.

Statistical Analysis
Data was expressed as Mean $\pm$ SD and all statistical tests were at a 95per cent confidential interval and p < 0.05 taken as level of statistical significant using the Graph Pad software.

Tables 1 shows some anthropometric parameters of the medical students.

Parameters	Normal Weight		Overweight		Class1 Obesity		CV Predispostion
All subject	Male	female	Male	Female	Male	Female	
n 80	42	29	2	5	1	1	
Percentage(%) BMI	93.4	82.8	4.4	14.3	2.2	2.9	
n 80	22.56	22.12	25.92*	26.70*	31.12*	32.9*	Yes
n 80	42	32	(1)	2	1	1	
Waist	80.96	75.0	99.5*	95.0*	98.5*	98.0*	Yes
Circumference	97.68	97.52	114	105.5	119	114	
Hip	0.9	0.80	0.88*	0.81*	0.83	0.86	No
Circumference(cim)							
W-HR							
N 80	35	29	10	6	4	1	
SBP (mmHg)	118.86		128.5[a]	129.67[a]	120	110	
n 80	113.38		4	4			
DBP (mmHg)	41	31	90.0[b]	88.0[b]	80	70	
	74.73	75.16					

a = Systolic pressure (SBP) vs b = Diastolic pressure (DBP)

Table 2 BMI matched with Age group and sex of the medical students.

BMI	< 19 Yrs		20 – 24 Yrs		25 – 29 Yrs	
	Male	Female	Male	female	Male	female
Underweight	0	3(3.75%)	3 (3.75%)	3(3.75%)	1(1.25%)	0
Normal Weight	1	0	20(25%)	19(23.75%)	8(10%)	2(5%)
Overweight	0	0	10 (12.5%)	4(2.5%)	1(1.25%)	1(1.25%)
Obesity	0	0	0	⑧	1(1.25%)	1(1.25%)

RESULTS AND DISCUSSION

Our results showed that none of the subjects was underweight while 88.8% had BMI in the normal range (males 93.4%; females - 82. 8%). 18.7% of the subjects were overweight (male 4.4%; females 14.3%) and 2.5% class 1 obesity was observed (males 2.2%; females 2.9%) (Table 1). In the age group classification, a 12.5% underweight was observed with 3.75% females in > 19years; 3.75% males and females in 20-24 years and 1.25% males in 25-29 years group (Table 2). None of our subjects had abdominal or truncal obesity hence they were not predispose to the established risk of several chronic ailments reported (Rexiode et al 1998). Also, the overweight ones had SBP >120mm Hg while the males had DBP > 90mmHg thus indicating a high blood pressure tendency and agreed with postulation of World Heart Federation (2004). With a larger hip, and a possible indication of lower body muscles and protection, and a pattern for type of obesity seen in females hence their less predisposition to cardiovascular conditions as recently proposed (Lancet 2005). The overweight and class 1 obese subjects could be predisposed to risk of high blood pressure and cardiovascular ailments confirmed to be associated with the anthropometric parameters above normal. It is recommended that such persons should check this tendency or, else they will develop cardiovascular ailments and obesity in the nearest future.

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