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PAPER

The validity of body mass index in predicting body fat percentage

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Introduction:

Obesity has become a leading health concern worldwide. It has become a foremost factor for morbidity and mortality due to non communicable diseases. (Eg: Ischemic Heart Disease, Diabetes Mellitus). Body Mass Index (BMI) is commonly used to define obesity, which is mainly the high body fat content. However, prediction of body fat content using BMI is somewhat controversial. On the other hand, methods like Bio-Impedance Analysis (BIA) is more accurate in predicting body fat content, but lacks population level data for Sri Lanka. This study was designed to fulfill those shortcomings in body fat measurements.

Objectives:

To determine the relationship between body fat percentage and gender
To determine the validity of body mass index in predicting body fat percentage

Method:

46 participants including 25 obese (Asian cut off value for obesity >25 kg/m^2) and 21 healthy volunteers (non-obese) were recruited in a preliminary cross –sectional study in the Obesity Clinic at North Colombo Teaching Hospital and Family Medicine Clinic, Faculty of Medicine, Ragama. A pre-tested, interviewer-administered questionnaire was distributed to collect data. Height and weight were measured for BMI calculation and percentage body fat was measured using BIA analyzer (MOTEX, 060607-U-01).

Results:

The obese group had 68% women and 32% men. 86 % of the non-obese group was female. 12% of obese group and 9.5% of non-obese group were suffering from chronic diseases such as hypertension and bronchial asthma in our sample.72% of obese group and 42 % of non-obese group had a family history of obesity.

In the obese group mean BMI values were calculated as 31.76kg/m^2 (SD=4.36) and 28.575kg/m^2 (SD=3.27) for females and males respectively. According to the results, mean values of body fat percentage were 40.8% and 25.82 % for obese women and men respectively. Asian cut off values of obesity according to the 2004 WHO Expert Committee corresponded to 31-39% (mean 35%) body fat in females and 18-27% (mean 22%) body fat in males. Both BMI and body fat percentage data recorded for the non-obese group were within the WHO Asian standards.

Relationship of the BMI to body fat percentage was tested by regression analysis. The correlation coefficient of BMI to body fat percentage for females is 0.94 and for the males it is 0.98, which suggests that BMI is a stronger predictor of body fat percentage for both females and males, within the limits of the current study.

Conclusion:

The results suggest that BMI is a stronger predictor of body fat percentage for both sexes. Even though the body fat percentage of females was higher than males, it was compatible with WHO Asian values.