

Evaluation of Bone and Body Mineral Profile in Association with Protein Content, Fat, Fat-Free, Skeletal Muscle Tissues According to Obesity Classification among Adult Men

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Abstract : Obesity is associated with increased fat mass as well as fat percentage. Minerals are the elements, which are of vital importance. In this study, the relationships between body as well as bone mineral profile and the percentage as well as mass values of fat, fat-free portion, protein, skeletal muscle were evaluated in adult men with normal body mass index (N-BMI), and those classified according to different stages of obesity. A total of 103 adult men classified into five groups participated in this study. Ages were within 19-79 years range. Groups were N-BMI (Group 1), overweight (OW) (Group 2), first level of obesity (FLO) (Group 3), second level of obesity (SLO) (Group 4) and third level of obesity (TLO) (Group 5). Anthropometric measurements were performed. BMI values were calculated. Obesity degree, total body fat mass, fat percentage, basal metabolic rate (BMR), visceral adiposity, body mineral mass, body mineral percentage, bone mineral mass, bone mineral percentage, fat-free mass, fat-free percentage, protein mass, protein percentage, skeletal muscle mass and skeletal muscle percentage were determined by TANITA body composition monitor using bioelectrical impedance analysis technology. Statistical package (SPSS) for Windows Version 16.0 was used for statistical evaluations. The values below 0.05 were accepted as statistically significant. All the groups were matched based upon age ($p > 0.05$). BMI values were calculated as $22.6 \pm 1.7 \text{ kg/m}^2$, $27.1 \pm 1.4 \text{ kg/m}^2$, $32.0 \pm 1.2 \text{ kg/m}^2$, $37.2 \pm 1.8 \text{ kg/m}^2$, and $47.1 \pm 6.1 \text{ kg/m}^2$ for groups 1, 2, 3, 4, and 5, respectively. Visceral adiposity and BMR values were also within an increasing trend. Percentage values of mineral, protein, fat-free portion and skeletal muscle masses were decreasing going from normal to TLO. Upon evaluation of the percentages of protein, fat-free portion and skeletal muscle, statistically significant differences were noted between NW and OW as well as OW and FLO ($p < 0.05$). However, such differences were not observed for body and bone mineral percentages. Correlation existed between visceral adiposity and BMI was stronger than that detected between visceral adiposity and obesity degree. Correlation between visceral adiposity and BMR was significant at the 0.05 level. Visceral adiposity was not correlated with body mineral mass but correlated with bone mineral mass whereas significant negative correlations were observed with percentages of these parameters ($p < 0.001$). BMR was not correlated with body mineral percentage whereas a negative correlation was found between BMR and bone mineral percentage ($p < 0.01$). It is interesting to note that mineral percentages of both body as well as bone are highly affected by the visceral adiposity. Bone mineral percentage was also associated with BMR. From these findings, it is plausible to state that minerals are highly associated with the critical stages of obesity as prominent parameters.

Keywords : bone, men, minerals, obesity

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