

Evaluation of the Weight-Based and Fat-Based Indices in Relation to Basal Metabolic Rate-to-Weight Ratio

Authors : Orkide Donma, Mustafa M. Donma

Abstract : Basal metabolic rate is questioned as a risk factor for weight gain. The relations between basal metabolic rate and body composition have not been cleared yet. The impact of fat mass on basal metabolic rate is also uncertain. Within this context, indices based upon total body mass as well as total body fat mass are available. In this study, the aim is to investigate the potential clinical utility of these indices in the adult population. 287 individuals, aged from 18 to 79 years, were included into the scope of the study. Based upon body mass index values, 10 underweight, 88 normal, 88 overweight, 81 obese, and 20 morbid obese individuals participated. Anthropometric measurements including height (m), and weight (kg) were performed. Body mass index, diagnostic obesity notation model assessment index I, diagnostic obesity notation model assessment index II, basal metabolic rate-to-weight ratio were calculated. Total body fat mass (kg), fat percent (%), basal metabolic rate, metabolic age, visceral adiposity, fat mass of upper as well as lower extremities and trunk, obesity degree were measured by TANITA body composition monitor using bioelectrical impedance analysis technology. Statistical evaluations were performed by statistical package (SPSS) for Windows Version 16.0. Scatterplots of individual measurements for the parameters concerning correlations were drawn. Linear regression lines were displayed. The statistical significance degree was accepted as $p < 0.05$. The strong correlations between body mass index and diagnostic obesity notation model assessment index I as well as diagnostic obesity notation model assessment index II were obtained ($p < 0.001$). A much stronger correlation was detected between basal metabolic rate and diagnostic obesity notation model assessment index I in comparison with that calculated for basal metabolic rate and body mass index ($p < 0.001$). Upon consideration of the associations between basal metabolic rate-to-weight ratio and these three indices, the best association was observed between basal metabolic rate-to-weight and diagnostic obesity notation model assessment index II. In a similar manner, this index was highly correlated with fat percent ($p < 0.001$). Being independent of the indices, a strong correlation was found between fat percent and basal metabolic rate-to-weight ratio ($p < 0.001$). Visceral adiposity was much strongly correlated with metabolic age when compared to that with chronological age ($p < 0.001$). In conclusion, all three indices were associated with metabolic age, but not with chronological age. Diagnostic obesity notation model assessment index II values were highly correlated with body mass index values throughout all ranges starting with underweight going towards morbid obesity. This index is the best in terms of its association with basal metabolic rate-to-weight ratio, which can be interpreted as basal metabolic rate unit.

Keywords : basal metabolic rate, body mass index, children, diagnostic obesity notation model assessment index, obesity

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