BODY BUILD AND THE INTERPRETATION OF BODY MASS INDEX

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Garn, Leonard and Hawthorne (1986) first reported that body build affects the interpretation of body mass index (BMI) which is extensively used as an indicator of obesity. These workers have reported that individuals with short legs and a comparatively long torso have BMI values higher by as much as 5 units than longer legged individuals of the same height. It has also been found that for a given level of subcutaneous fat assessed at four skinfold sites (Dumin and Womersley 1974), Aboriginal women have a BMI which is 1-2 units lower than that of Caucasian women with the same sum of skinfolds (Coles-Rutishauser 1987). The body build of Australian Aborigines is very different from other ethnic populations, with comparatively long legs and short trunk (Martin and Saller 1957). These data also suggest that body build has some affect on the interpretation of BMI. Thus the purpose of this study was to assess the affect of body build (as determined by relative sitting height (RSH)) on BMI by assessing body composition using a variety of methods.

Thirty-three female subjects from Deakin University (aged 18-33) participated in the study. The group was divided on the basis of their body build (the 17 lowest RSH versus the 16 highest RSH). Percentage fat was assessed using the following methods: BMI (Womersley and Dumin 1977); skinfolds (Durnin and Womersley 1974); deuterium dilution (Schoeller et al. 1980); densitometry (Pasco, Rutishauser and Read 1986) and bioelectrical impedance (Kushner and Schoeller 1986). The results have been expressed as the mean ± standard deviation obtained for each method (see table). Percent fat from BMI was similar in both body build groups but there was a consistent trend for the low RSH group to have a higher % fat by all other methods. When comparing the different methods between the groups, for % fat from bioelectrical impedance the low RSH group had a significantly higher value ($P<0.05$) than those in the high RSH group.

	low RSH	high RSH
n	17	16
Height (cm)	167.4±6.02	162.8±3.85
Sitting height (cm)	87.4±3.0	88.2±3.9
BMI(%)	24.0±3.6	24.3±3.2
Skinfolds (%)	25.9±5.5	24.3±5.0
Densitometry(%)	27.9±6.2	23.8±6.2
Deuterium dilution (%)	25.9±9.6	22.2±6.6
Bioelectrical impedance (%)	25.7±6.5	21.1±6.1

In conclusion these results suggest that BMI may provide an underestimate of body fat in individuals with a low RSH. Therefore when BMI is used as an indicator of obesity, body build should be taken into account.

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