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ARPALAK PAKSAICHOL : BODY FATNESS AND BIOELECTRIC  
IMPEDANCE ANALYSIS IN THAI FEMALE ADULTS: VALIDATION OF  
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Bioelectric impedance analysis (BIA) is a useful method for the assessment of body composition. Several prediction equations for fat-free mass (FFM) and percentage of body fat (%BF) have been developed for specific groups of population. However, such an equation for Thais is currently lacking. In addition, the possible interference of menstrual cycle in women's BIA is still unsettled. Therefore, the aims of this study are: 1) to reinvestigate the effect of menstrual cycle on BIA; 2) to test whether or not the equation used by the BIA manufacture is valid for Thai young women; 3) to validate the Lohman equation for estimation of FFM using BIA for Thai female subjects; and 4) to generate a new equation that accurately predicts body fat for Thai women, if the previously developed equations cannot be used for Thai subjects. In the first experiment, 21 volunteers, age between 18-29 yrs and %BF in the range of 15-30%, were recruited from Samutsakorn area. Menstrual cycle was divided into 4 phases, namely, menstrual, follicular, postovulatory, and premenstrual phases. BIA (resistance; R; and reactance; Xc) and body weight (BW) measurements were recorded everyday for 28 days. The results showed no changes in the BW throughout the menstrual cycle and both R and Xc were not different ( $p > 0.05$ ; in repeated measurements using one-way ANOVA) in all phases of menstruation. The data suggested that the assessment of body composition using BIA is independent of various phases of menstrual cycle. In the second experiment, FFM was assessed both by BIA and reference methods, under water weighing (UWW) at residual lung volume (RV), in 161 Thai female subjects aged between 18-29 yrs. FFM determined from the density derived from the two-component model was compared with FFM estimated from BIA manufacturer and Lohman equations. FFM calculated from the BIA manufacturer was significantly different from the value obtained by the reference method. In contrast, no difference was noted between FFM obtained from the Lohman equation and UWW. The data from BIA yield high correlation coefficient ( $r = 0.93$ ), high regression ( $R^2 = 0.86$ ) and small standard error of estimation (SEE = 1.89 kg) with UWW. Results in the present study confirm the validity of body composition determined by BIA using Lohman equation for Thai women, but caution should be made for obese subjects (%BF > 30%). Thus, the prediction equations for FFM are distinctly separate for normal body weight and obese population.