Predicting body surface area of Japanese children from body height and mass

Kayo Shitara, Yasuo Kawakami

INTRODUCTION: Body surface area (BSA) is an important parameter in physiology and clinical medicine. Several researchers have suggested various equations for predicting BSA using body height and mass, but no equation has been determined specifically for Japanese children. The purpose of this study was to newly develop equations for predicting BSA of Japanese children. METHODS: BSA was determined for 57 boys (7~13yr) and 45 girls (7~12yr) using a recently developed 3D photonic image scanning technique. Prediction equations for BSA was developed using body height (H) and mass (M) as independent variables for both sexes. RESULTS: The BSA prediction equations developed were: BSA (cm2) =95.234×H0.666×M0.428 for boys and BSA (cm2) =127.964×H0.614×M0.419 for girls. The coefficient of determination and standard error of estimation for these equations were, respectively, 0.996 and 140cm2 (1.2%) for boys and 0.993 and 141cm2 (1.2%) for girls. There was no significant difference between the predicted and measured BSA values and no systematic patterns were found to be involved in the residuals for either gender. On the other hand, all existing equations to date failed to predict BSA of children. CONCLUSIONS: BSA of Japanese children is predictable from body height and mass with high accuracy. Present gender-specific equations developed in this study should be used for predicting BSA of Japanese children.