【国際セッション1】

MEASURING ENERGY EXPENDITURE AND PHYSICAL ACTIVITY IN ELDERLY.

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INTRODUCTION

Total energy expenditure (TEE) and physical activity level (PAL) are major determinants to maintain low fat mass and high fat-free mass. Various instruments have been developed for assessing TEE and PAL, but there are few studies (Goris et al, 2001; Meijer et al, 2001) for validating these instruments in free-living elderly with doubly labeled water (DLW). Therefore, we compared the TEE calculated by DLW (TEE_{DLW}) with the TEE estimated by 1) a tri-axial accelerometer (TEE_{triAC}), 2) a uni-axial accelerometers (TEE_{uniAC}), and 3) a simplified physical activity record (TEE_{sPAR}) modified for elderly. We also examined the relationship between body composition and PAL.

METHODS

Healthy, free-living, older men and women ($n = 32$, 64-87 yr) participated in this study. Over a 14-day period, the participants wore a tri-axial accelerometer (Matsushita Electric Works Ltd, Osaka, Japan) and a uni-axial accelerometer (Lifecorder; Suzuken Co. Ltd, Nagoya, Japan), recorded their food intake and physical activity with a simplified physical activity record without detailed instructions (Kobnick et al, 2005). TEE was calculated by each conventional method and compared with TEE measured by multi-point doubly labeled water technique. Total body water and percent body fat were also calculated by DLW.

RESULTS AND DISCUSSION

Good agreements were observed between TEE_{triAC} , TEE_{sPAR} and TEE_{DLW} with no significant mean difference (Fig.1, 2). High correlation between TEE_{uniAC} and TEE_{DLW} was also observed, but their means were significantly different (Fig. 3). The difference between TEE_{uniAC} and TEE_{DLW} was significantly increased with increasing TEE. PAL by DLW was related to the percentage of time spent on moderate intensity activity and inversely related to the percentage of time spent on low intensity activity. There was not significant relationship between PAL and the percentage of time spent on high intensity activity. PAL was inversely related to the percent body fat. We suggest that the tri-axial accelerometer and the simplified physical activity record can be used to assess daily physical activity in free-living elderly with practical accuracy. We have also shown that the reduction of time spent with low intensity activity leads to the increase of PAL and contributes to the decrease of body fat in the elderly.

REFERENCES

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- Meijer EP, *et al*, Int J Obes 2001; 25: 935-939.

Fig. 1. the Bland-Altman plots between TEE_{triAC} and TEE_{DLW} .

Fig. 2. the Bland-Altman plots between TEE_{sPAR} and TEE_{DLW} .

Fig. 3. the Bland-Altman plots between TEE_{uniAC} and TEE_{DLW} .