MEASUREMENT OF ENERGY EXPENDITURE IN VARIOUS SOCCER TRAINIG BY A PORTABLE APPARATUS

Maeda, S. 1), Morishima, Y. 1), Yanai, A. 1), Nakamura, T. 1), Okuta, M. 1) & Miyagi, O. 1)

1) Graduate School of Sports and Health Science Studies, Daito Bunka Univ.,Japan

Keywords: energy expenditure, portable apparatus, soccer

Introduction

Energy expenditure during sport activities has been determined by the Motion Time Study. However, this method does not yield accurate values. Therefore, this study measured oxygen uptake ($\dot{V}O_2$) by a portable apparatus. The aim of this study was to determine accurate energy expenditure during various soccer training.

Methods

The subjects were fourteen soccer players. Measured variables were $\dot{V}O_2$, energy expenditure, metabolic equivalents (MET), heart rate (HR) and blood lactic acid (La) during various soccer training. Maximum oxygen uptake and maximum heart rate were determined by running on a motor-driven treadmill until subjects become exhausted. $\dot{V}O_2$ and HR during the training were measured throughout the training using a portable apparatus. Total weight of the apparatus each subject carried during training was about 1700g. The training contents were nine items, and it was five minutes each in measurement time.

Results & Discussion

Average values of $\dot{V}O_2$ and $\%\dot{V}O_2max$, energy expenditure, MET, HR and %HRmax, and La were 1.0~2.7l/min and 26.4~69.5%, 104.2~280.1kJ, 4.1~10.7METs, 93.5~165.4beats/min and 48.3~85.9%, and 1.1~5.5mmol/l, respectively. Previous studies have reported that energy expenditure values of training day were 5.6~7.6MJ/day, however this energy expenditure values were estimated values and were not examined in detail. Energy expenditure of soccer training has not been examined in detail.

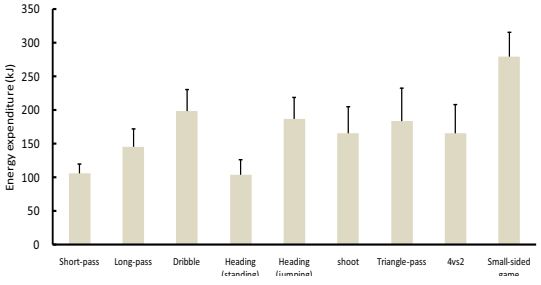

Figure 1. Energy expenditure during various soccer training

Conclusion

Exercise intensity of the soccer training that has not been provided became clear in this study. Exercise intensity provided in this study becomes the fundamental document to perform training reasonably.

References

1. Bangsbo, J. et al. (2006). Journal of Sports Sciences, 24(7): 665-674.