

28th ECSS Anniversary Congress, Paris/France, 4-7 July 2023

The effect of specific HIIT training with an intensity between the anaerobic threshold and the psychomotor fatigue threshold on the physiological parameters of young soccer players

Chmura, P., Chmura, J., Chodor, W., Drozdowski, A., Rokita, A., Konefal, M.

Wroclaw University of Health and Sport Sciences

INTRODUCTION:

Effective HIIT training requires determining the individual intensity that optimally stimulates the development of exercise capacity [1]. To achieve this, it is necessary to determine the minimum intensity at the anaerobic threshold (TAN) and the maximum intensity at the psychomotor fatigue threshold (PFT) [2,3]. The aim of the study was to assess the effect of specific HIIT training, performed between the TAN and the TPF on the physiological parameters of young soccer players. In addition, the aim of the study was to determine whether in 4x4 games on a 25x35 m pitch, the tested players exceed the anaerobic threshold and are able to achieve TPF intensity.

METHODS:

Fourteen young U-17 soccer players from a professional sports club competing in the second Polish league took part in the study. Physical activity of all field players was analyzed. Goalkeepers were excluded from the analysis due to the specificity of the effort. The project consisted of four stages of research: first, an exercise test with increasing load was applied in the laboratory, second six 3-minute 4 x 4 games were played with goalkeepers and with a break between games lasting 3 minutes, third of the experiment was to perform an additional program of three specific HIIT exercises twice a week on Tuesday and Thursday in a training microcycle lasted 4 weeks, fourth repeated first stage - an exercise test with increasing load, performed on a running treadmill in the laboratory. Lactate (LA) was analyzed to determine the anaerobic threshold, choice reaction time (CRT) to determine the psychomotor fatigue threshold and selected physiological parameters. External loads were determined using GPS (Catapult Sports, Melbourne, Australia). Repeated-measures ANOVA was used to compare mean values for the examined variables.

RESULTS:

It was found that after 4 weeks of specific HIIT training significantly increased VO₂ and running speed on TAN and TPF and HR on TAN. The tested players realized 4x4 games on a 25x35 m pitch exceed the intensity of effort on TAN, but do not reach the intensity on TPF.

CONCLUSION:

The proposed specific HIIT training, carried out between the anaerobic threshold and the psychomotor threshold of fatigue, consisting of three exercises, each subsequent one generating greater intensity, greater variability of the stimulus and longer duration, is a practical proposal that effectively increases the exercise capacity of football players.

1. Clemente et al. (2021), 2. Kunz et al. (2019), 3. Chmura & Nazar (2010).

Topic: Training and Testing

Presentation Poster

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