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©Journal of Sports Science and Medicine (2009) 08, 259 - 264

Research article



Differences in Ball Sports Athletes Speed Discrimination Skills Before and After Exercise Induced Fatigue

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Received: 17-12-2008 -- Accepted: 25-04-2009 -- Published (online): 01-06-2009

ABSTRACT

Substantial research exists in relation to the effect of fatigue on the cognitive skills of athletes. Very few studies in the sport domain, however, have investigated decision-making time and accuracy in relation to the discrimination of the speed of a moving object following exercise at maximal intensity. The purpose of this study was to examine differences in the pre- and post-fatigue speed discrimination skills of elite ballgames athletes to determine if they prioritize accuracy or speed of decision-making when physically exhausted. The participants in the study were 163 males (M = 21.17, SD = 4.18) Estonian national level soccer (n = 79), basketball (n = 63) and volleyball (n = 21) players. Peak oxygen uptake (VO₂max) was assessed during completion of an incremental exercise test on a treadmill. Speed discrimination stimuli were images of red square-shapes on a grey background presented moving along the sagittal axis at four different virtual velocities on a computer (PC) screen. Repeated measures MANOVA revealed a significant main effect for the decision-making time factor. A second MANOVA revealed a significant main effect for the decision-making accuracy factor. The soccer group made a significantly lower number of errors than the basketball group (p = 0.015) in pre- and post-fatigue decision-making accuracy. The results showed that athletes' decision-making time decreased and decision-making errors increased after a maximal aerobic capacity exercise task. A comparison of the pre- and post-fatigue speed discrimination skills of experienced basketball, volleyball and soccer players indicated that the only significant difference was for decision-making accuracy between the soccer and basketball groups. The current findings clearly demonstrated that the athletes made decisions faster at the expense of accuracy when fatigued.

Key words: Decision-making, perception, exhaustion, elite-athletes.

Key Points

- The purpose of this study was to examine differences in the pre- and post-fatigue speed discrimination skills of elite ballgames athletes to determine if they prioritize accuracy or speed of decision-making when physically exhausted.

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Kaivo Thomson, Anthony P. Watt, Jarmo Liukkonen, (2009) Differences in Ball Sports Athletes Speed Discrimination Skills Before and After Exercise Induced Fatigue. *Journal of Sports Science and Medicine* (08), 259 - 264.

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