

**RESEARCH ARTICLE****Evaluation of Fatigue Index at Different Times of the Day on
Male Handball Players****Chittibabu,B**

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ARTICLE INFO**Article History:**Received 10th July, 2013Received in revised form 25th, July, 2013Accepted 15th August, 2013Published online 28th August, 2013**Key words:**Fatigue index, Handball, Time of the day,
RAST**ABSTRACT**

The purpose of the present study was to compare fatigue index at different times of the day on male handball players. To achieve the purpose 29 male handball players were selected from Department of physical Education and Sports Sciences, Annamalai University. Fatigue index was measured by Running based anaerobic sprint test (RAST). The data was collected at two different times of the day at 07:00 am and 17:00 pm. The collected data was analysed using dependent *t* test. The result of the study showed significant difference in fatigue index at different times of the day ($t = 2.316, p = 0.028$). It identified that greater decline in power output is elicited during morning than evening.

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INTRODUCTION

Most individuals consider that their athletic prowess is best in the late afternoon and early evening, and this is the time period when best performances and even world records are most often likely to be set in competitions. External factors may be in part responsible, the world records set in track and field events in the evening reflecting the times at which Grand Prix events and major championships are held in front of large crowds and the media. However, recent reviews have considered the evidence that sports performance shows a diurnal rhythm that is, in part at least, due to the activities of a "body clock" (Waterhouse, *et al.*, 2004). Exercise performance displays a diurnal (daytime) rhythm with higher values in the late afternoon (around 1600–2000 hours) than in the morning soon after waking (around 0700–1000 hours). In athletes maximal anaerobic power output (Souissi, *et al.*, 2007) and show diurnal variation. When rhythmic changes have been characterised from at least six measures obtained at equally spaced intervals throughout the 24 h, the peaks in performance are located from about 15:30 to 20:30 hours, with amplitudes ranging from 2 to 11% of the daily mean (summarised in Reilly 2007).

The diurnal increase in central body temperature may exert a beneficial passive warm-up that may enhance metabolic reactions, increase the extensibility of connective tissue, reduce muscle viscosity, and increase conduction velocity of action potentials (Shephard, 1984). Fatigue index is the rate at which power output declines. The purpose of the present study was to compare fatigue index at different times of the day on male handball players.

METHODS**Subject**

Twenty nine (29) male handball players were selected from Department of physical Education and Sports Sciences,

Annamalai University. There age ranged between 18 to 25 years. The data was collected at two different times of the day at 07:00 am and 17:00 pm.

Variables and test

The test consists of six times 35m discontinuous sprints. Each sprint represents a maximal effort with 10 seconds allowed between each sprint for the turnaround. The time for each sprint was used as the criterion score during the RAST. The timing was recorded using stop watch. The fastest time (FT), total sprint time to complete the 6×35-m sprints (TT) and sprint decrement (SD) as fatigue index were calculated by dividing the sum of the sprinting times for 6 sprints by the best possible total score and then multiplying by 100. According to Fitzsimons, *et al.*, (1993) total sprint time (TT) to complete the 6×35-m sprints and sprint decrement as fatigue index (FI) were considered as RSA variables.

Statistical technique

The collected data was analysed using dependent *t* test. The data was analysed with SPSS statistical package (16 versions). The criterion for significance was set at an alpha level of $p < 0.05$.

RESULTS**Table 1** Comparison of fatigue index at different times of the day

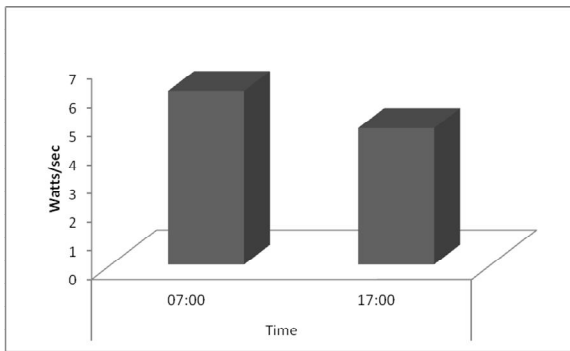
Test time	Mean	Standard deviation	<i>t</i>	<i>p</i>
07:00 am	6.07	2.44	2.316	0.028
17:00 pm	4.77	1.78		

The result of the study showed that there is a significant difference in fatigue index at two different times of the day presented in table 1. The obtained *t* value is 2.316 is significant at 0.05 level of confidence ($p < 0.05$).

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Figure 1 daytime variation in fatigue index in male handball players



DISCUSSION ON FINDINGS

In the present study fatigue index found to be high in morning. In this study fatigue index was measured by RAST test. The result of the current research is compatible with the results of Souissi, *et al.*, (2007). Wingate testing also showed greater decline in power output in morning than evening (Figure 1). The possible reason for this difference may be due to core temperature. Increase in core temperature may enhance metabolic reactions, increase the extensibility of connective tissue, reduce muscle viscosity, and increase conduction velocity of action potentials (Shephard, 1984).

CONCLUSION

The rate of decline in speed displays a diurnal (daytime) rhythm with higher values in the evening (17:00 hours) than in the morning (07:00 hours). The repeated sprint ability training may be administered during evening which produces pronounced effect during matches that are played during evening.

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