Individual variability in heart rate recovery after standardized submaximal exercise

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Introduction
Heart rate recovery (HRR) after standardized submaximal exercise has been proposed as a useful variable to monitor change in performances. However, it is well known that heart rate is influenced by several factors such as training load and psychosocial stress. The aim of this study was to look at individual variability in HRR from one week to another using the heart rate interval monitoring system (HIMS) in elite hockey players.

Methods
Eight elite Dutch female indoor hockey players completed the HIMS two weeks in a row. Training load was monitored using the Foster-method and psychosocial stress using the RESTQ-Sport. Heart rate at the end (HR_end) of the HIMS and HRR was correlated and compared for week 1 and 2. Also week load and psychosocial stress and recovery was compared for week 1 and 2.

Results
The means of HR_end and HRR showed no significant difference from one week to another. For HR_end a strong correlation (r=0.984 p<0.01) was found between weeks (fig.1). HRR on the contrary showed no correlation (fig.2). In workload (fig.3) and psychosocial stress and recovery (fig.4) no significant difference was shown from one week to another.

Discussion & Conclusion
Athletes seem to reach the same HR_end each time, corresponding to earlier research and explained by the fact that running speed is controlled by the auditory signal. Although there was no difference in mean HRR between weeks, there was no correlation indicating large individual differences. This variability in HRR could not be explained by workload or psychosocial stress and recovery. In conclusion HRR seems harder to control compared to submaximal HR, therefore standardization of the HIMS is very important. HRR interpretation should be done with care.

References