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LETTER TO THE EDITOR

WILEY

Is obesity related to postexercise cardiac autonomic recovery?

Dear Editor,

We read with great interest the article by El Agaty, Kirmani, and Labban (2016) which evaluated the heart rate variability (HRV) during recovery from exercise in overweight healthy female young adults. According to the authors, the results provided evidence that overweight is associated with delayed vagal reactivation after exercise. We would like to add some comments and contributions to this article.

Although many studies have shown an autonomic dysfunction at rest in obese subjects, little is known about the impact of obesity on postexercise cardiac autonomic recovery (Eyre, Duncan, Birch, & Fisher, 2014). The autonomic stress imposed by exercise continues during the postexercise period, with parasympathetic reactivation and sympathetic withdrawal (Peçanha et al., 2017). For this reason, HRV analysis during the postexercise period has been proposed to be a surrogate marker of the cardiac autonomic recovery (Peçanha et al., 2017).

Heart rate variability is usually measured during 5-min rest periods or other stationary condition to guarantee the minimum points to reliably assess of HRV (TaskForce, 1996). The stationary condition is needed in order to assume the "stationarity of the data," a mathematical concept that must be present in the heart rate time series for the spectral analysis of HRV (Peçanha et al., 2017). However, this is impossible for the analysis of HRV after exercise (Peçanha et al., 2017). Goldberger et al. (2006) proposed an alternative for the analyzing HRV during recovery phase from exercise, since the problem with postexercise HRV analysis could be minimized by dividing the entire recovery period into short segments and analyzing HRV in each of them. These authors suggest that the root-mean square differences of successive RR intervals calculated in 30s (RMSSD30s) segments seem to represent accurately the parasympathetic reactivation after the exercise.

However, this alternative is problematic for the frequency domain HRV analysis, because there is variation of parasympathetic and sympathetic modulations (Peçanha et al., 2017). Therefore, using the conventional frequency domain approach to perform spectral analysis of the postexercise recovery curve will result in inconsistent values, since this is unable to catch the time-related variations in frequency and amplitude throughout the recovery period (Peçanha et al., 2017). Consequently, the spectral analysis of the whole recovery time in the postexercise period has been discouraged (Peçanha et al., 2017).

Although this study presents an important research question, their results should be viewed with caution since the conclusions were based on the frequency domain data, which is not indicated to represent HRV postexercise recovery (Peçanha et al., 2017). Also, the RMSSD data, which has shown good reproducibility and represent the parasympathetic system (Peçanha et al., 2017), was not different between the recovery period and baseline in neither groups.

Another important aspect that needs to be considered is the exercise intensity, which affects autonomic responses during the recovery period (Peçanha et al., 2017). The authors used a submaximal step test, but the intensity reached in each group was not mentioned. The high value of HR observed in the overweight group after exercise could be attributed to the high exercise intensity reached in this group.

In conclusion, based on the study of El Agaty et al. (2016), it is not possible to confirm that obesity is related to delayed vagal reactivation after exercise in healthy female young adults. Further studies should apply adequate methodological approach in postexercise cardiac autonomic recovery analysis.

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