Heart rate variability (HRV) is considered a valuable non-invasive marker of modulations of the autonomic nervous system and particularly cardiac vagal tone. In exercise training situations, its importance lies in its potential to identify overtraining syndrome. In the measurement of short-term heart rate variability (HRV) the reliability of a number of instruments has been reported (Sandercock et al., 2004). Recently, a practical and user-friendly system for recording beat-to-beat heart rate (or RR interval) has been developed (Polar S810 heart rate monitor). Moreover, new software (SFT) for the advanced analysis of RR interval data presents the use of S810 to calculate HRV with apparent ease. The reliability of HRV obtained in this manner is unknown. The aims of the present study were twofold; 1) to assess the reliability of short-term HRV measures obtained using the S810 and SFT and 2) to assess the effect of altering SFT parameter settings on measures of HRV. Reliability in the present study is defined as the repeatability of repeated measures. 19 males and 14 females of good health performed a 10 minute supine rest on three separate occasions during which RR intervals were recorded with the S810. The signal was corrected before separate time domain and frequency domain (fast Fourier transformation) analyses were undertaken. To assess repeatability, intraclass correlation coefficient (ICC) and between and within subjects coefficient of variation (CV) were calculated. Repeated measures ANOVA (rm-ANOVA) was used to assess the effect of altering parameter settings on measures of HRV. Three parameter settings were altered in the following manner: Settings 1 (S1) – smoothness priors detrend, interpolation rate 2 Hz, and alpha 1000; Settings 2 (S2) – smoothness priors detrend, interpolation rate 4 Hz, and alpha 500; Settings 3 (S3) – no detrend and interpolation rate 2 Hz.

SFT and S810 display acceptable to good reliability of short-term HRV and no setting was more reliable than the other when assessed using ICC. When assessed by CV, short-term HRV showed unacceptably large inter-individual variation for both SFT and S810; Intra-individual variation was equally unacceptable although was approximately 50% lower in both systems; and S3 displayed greater reliability than S1, S2 and S810. For both systems, and by ICC and CV, time domain indices were more reliable than those of the frequency domain. Reliability outcomes were in agreement with those previously reported (Sandercock et al., 2004; Højgaard et al., 2005). Specifically altering the parameter settings within SFT significantly altered both HRV index outcomes and reliability. Future studies using SFT should indicate and give justification for chosen parameter settings and maintain these for repeated measures. Wide variation between individuals illustrates the variable nature of short-term measures of HRV and highlights the need for establishing a range for so called ‘normal’ HRV. Højgaard, M. V., Holstein-Rathlou, N., Agner, E. and Kanters, J. K. (2005). Reproducibility of heart rate variability, blood pressure variability and baroreceptor sensitivity during rest and head-up tilt. Blood Pressure Monitoring, 10, 19-24.


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