

Easily Accessible and Accurate Method to Assess Heart Rate Variability in Humans

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ABSTRACT

Background: Measuring autonomic tone has been done using a variety of heart rate data-collecting devices. The analysis of the collected information is complicated and cumbersome. Creating an easier method of collecting and analyzing this information could make the use of this technology more accessible to a wider audience. The Omegawave Sport (OW) device is an innovative device that can be used to collect and analyze heart rate variability (HRV) data. This device reports indices that represent parasympathetic tone, sympathetic tone, the contribution of the respiratory wave, and a new parameter called the tension index. **Objective:** Hypothesis: The OW device is an easy-to-use and accurate piece of equipment that can be used as an alternative to other more complicated HRV collection and analysis methods in athletes. **Methods:** 222 athletes (78 females) were tested prior to competition. The Omegawave Sport testing device was used to collect and analyze electrocardiographic data. The results for HRV as produced by the Omegawave Sport device were compared to those calculated using traditional time and frequency domain (FFT) analysis. **Results:** Mean age of athletes was 29.5 years (95% CI 28.2 to 30.6). OW measure of parasympathetic tone (dx) demonstrated excellent correlation with standard measures of SDNN2, RMSSD2, and total power (0.86, 0.74, 0.72). OW measure of sympathetic tone (A_{mo}) is inversely correlated to PNN50 (-0.76). Consistent with HRV constructs, the contribution of breathing frequency (sig. resp. wave) correlates with SDNN2, RMSSD2, PNN50 (0.74, 0.76, 0.71). **Conclusions:** The HRV measures obtained using OW correlate significantly with the existing methods. Using a unique, readily accessible technology, HRV measurements can be obtained in athletes, and potentially in patients, more quickly and easily. Such a device is necessary to make HRV assessment and research accessible to a larger sports medicine and emergency medicine audience.