

Repeatability Value in Heart Rate Associated with Experienced Zen Meditation

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Zen is a traditional meditation method which utilizes unification of body, respiration and mind. Though Zen has been sophisticated highly in Japan, it is spreading widely into western world today, realizing deeper meditation with minimum body movement and distraction. While heart rate variability (HRV) during controlled breathing by the subject has been studied in the past where the variability of HRV between repeat measurements in the same subject was still very high, there remains a lack of consensus whether heart rate during Zen practice elicit consistent repeatability measures of HRV especially for experienced and practicing Zen meditator. To better understand the repeatability of hemodynamic events elicited by deep Zen meditation during Zazen, we studied heart rate in 5 experienced Zen meditators and beginners. The study took place over 8 sets of Zen meditations in a quiet, Zen practice hall in Kamakura or Tokyo. Each set of Zazen lasted for 25 minutes. The first sets were used for habituation, and the data obtained from the following seven sets were used for analysis. Population averaged results for heart rate were not significantly different between experienced and beginners. Power spectrum analysis showed distinctive change in frequency components. Very low frequency (VLF) components decreased for experienced meditators ($p=0.05$). Most notably, standard deviations from 7 sets of measurements within each subjects were significantly low for experienced meditators ($p=0.05$), showing increased repeatability. During Zen practice, we seat ourselves in a lotus posture, practice Tanden respiration, i.e., lower abdominal breathing, and keep mind free from specific state of consciousness. We attribute the decrease in VLF components to the less easily distracted meditation, and the increase in repeatability to the effective regulation of mind and body movement during experienced Zen meditation toward the edge of sleep, but not quite over it. This result suggests the possibility of HRV repeatability as a handy and quantitative evaluator for Zen meditation.