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Heart rate variability of anaesthesiology registrars pre and post night call at a central hospital

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Abstract

Background

Heart rate variability (HRV) is a tool used to measure the bio-psycho-social aspects of stress. Night call is associated with increased levels of stress and therefore decreased HRV. HRV in anaesthetists is currently unknown. The aim of this study was, therefore, to compare HRV pre and post night call in registrars in the Department of Anaesthesiology at Chris Hani Baragwanath Academic Hospital.

Methods

This was a cross-sectional study using convenience sampling. Pre and post night call HRV recordings were taken from 27 registrars using the Suunto® Smart Belt. The computer-based software Kubios® was used for data analysis. Time- and frequency-based analyses were done. The normal values from a systematic review for short-term HRV were used in this study.

Results

Overall HRV was low with no significant difference pre and post night call (Low frequency to high frequency ratio (LF:HF), 3.215 vs 3.473, p=0.719). There was no significant difference in overall HRV pre and post call between male and female registrars (LF:HF, 3.331 vs 3.090, p=0.805 and 4.128 vs 2.768, p=0.296). No significant differences in overall HRV pre and post call between junior and senior registrars (LF:HF, 3.094 vs 3.391, p=0.765 and 3.034 vs 4.113, p=0.417). However, there was a significant difference in post call overall HRV in time-domain variable, standard deviation of the normalised RR interval (SDNN) (54.2 vs 42.4, p=0.048). There was a positive, statistically significant correlation between number of night calls, SDNN (r=0.456, p=0.0017) and the square root of the mean squared differences of successive NN intervals (RMSSD) (r=0.502, p=0.008).

Conclusion

In this study, registrars showed increased sympathetic nervous system dominance, with the associated decreased HRV both pre and post night call with no significant difference between these two time periods. The reasons for this decreased HRV may be multifactorial. There was no significant difference between HRV of male and female registrars or between junior and senior registrars.