

Letter to the Editor

The importance of selection criteria for the evaluation of Heart Rate Variability in women

Dear Editor,

Heart rate variability (HRV) is a noninvasive electrocardiographic marker reflecting the activity of the sympathetic and vagal components of the autonomic nervous system on sinus node function. It expresses the total amount of variations of instantaneous heart rate¹. Thus, HRV analyzes the tonic baseline autonomic function. A predominance of sympathetic tone in cardiac activity induces tachycardia and reduces beat-to-beat variations, whereas parasympathetic nerve activity reduces heart rate and increases HRV. Spectral analysis of HRV has been used to explore dynamic mechanisms in the cardiovascular system and appears to provide a quantitative evaluation of the sympathovagal interaction that modulates cardiovascular function in several clinical conditions²⁻⁵. We read with interest the report of Matei et al⁶ about the cardiac autonomic function in subjects with and without migraine by using 24-hour ambulatory electrocardiographic recordings. The study showed a reduced parasympathetic activity with sympathetic predominance in migraine patients during the night period, most affected being migraine with aura patients. We suggest to better underline the exclusion criteria of the study population. The presence of diabetes mellitus, uncontrolled hypertension, documented cardiovascular disease, narcolepsy, sleep apnea requiring continuous positive airway pressure therapy, obesity hypoventilation syndrome, chronic respiratory disease, thyroid disease, or some medications (i.e., sex steroid hormones, antidepressants, appetite suppressants, converting enzyme inhibition, β -blockers, L-thyroxine) may influence the autonomic nervous system and could have induced bias in the results^{7,8}. Matei et al^{9,10} did not give any information about the length of time or quantity of active smoking or exposure to environmental tobacco smoke, all factors of great importance for the vagal heart modulation. Furthermore, only women aged 20 to 35 years were enrolled in the study, but no information about the fertility state was shown. For their young age (26.7 ± 2.12 years), we suppose that nobody of the all enrolled women was in menopausal state; however, we suggest to evaluate the possible correlation between cardiovascular autonomic indexes and some sex hormones (i.e. estradiol, follicle-stimulating hormone, testosterone and dehydroepiandrosterone sulfate), so adding strength to their findings.

Conflict of Interest

The Authors declare that they have no conflict of interests.

References

- 1) STEIN PK, BOSNER MS, KLEIGER RE, CONGER BM. Heart rate variability: a measure of cardiac autonomic tone. *Am Heart J* 1994; 127: 1376-1381.
- 2) MALLIANI A, PAGANI M, LOMBARDI F, CERUTTI S. Cardiovascular neural regulation explored in the frequency domain. *Circulation* 1991; 84: 482-492.
- 3) AMMENDOLA E, RUSSO V, POLITANO L, SANTANGELO L, CALABRÒ R. Is heart rate variability (HRV) a valid parameter to predict sudden death in Becker muscular dystrophy patients? *Heart* 2006; 92: 1686-1687.
- 4) NIGRO G, RUSSO V, DE CHIARA A, RAGO A, DELLA CIOPPA N, ARENA G, CHIANESE R, MANFREDI D, CALABRÒ R. Autonomic nervous system modulation before the onset of sustained atrioventricular nodal reentry tachycardia. *Ann Noninvas Electro* 2010; 15: 49-55.
- 5) RUSSO V, DE CRESCENZO I, AMMENDOLA E, SANTANGELO L, CALABRÒ R. Sympathovagal balance analysis in idiopathic postural orthostatic tachycardia syndrome. *Acta Biomed* 2007; 78: 133-138.
- 6) MATEI D, CONSTANTINESCU V, CORCIOVA C, IGNAT B, MATEI R, POPESCU CD. Autonomic impairment in patients with migraine. *Eur Rev Med Pharmacol Sci* 2015; 19: 3922-3927.

- 7) RUSSO V, NIGRO G, DE CHIARA A, RAGO A, CALABRÒ R. The impact of selection criteria of obese patients on evaluation of heart rate variability following bariatric surgery weight loss. *Obes Surg* 2009; 19: 397-398.
- 8) RUSSO V, NIGRO G, CALABRÒ R. Heart rate variability, obesity and bariatric induced weight loss: the importance of selection criteria. *Metabolism* 2008; 57: 1622.
- 9) BARUTCU I, ESEN AM, KAYA D, TURKMEN M, KARAKAYA O, MELEK M, ESEN OB, BASARAN Y. Cigarette smoking and heart rate variability: dynamic influence of parasympathetic and sympathetic maneuvers. *Ann Noninvasive Electro* 2005; 10: 324-329.
- 10) FELBER DIETRICH D, SCHWARTZ J, SCHINDLER C, GASPOZ JM, BARTHÉLÉMY JC, TSCHOPP JM, ROCHE F, VON ECKARDSTEIN A, BRÄNDLI O, LEUENBERGER P, GOLD DR, ACKERMANN-LIEBRICH U; SAPALDIA-TEAM. Effects of passive smoking on heart rate variability, heart rate and blood pressure: an observational study. *Int J Epidemiol* 2007; 36: 834-840.

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