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Original Research Article

Resting heart rate of 1st semester students of a medical college in Odisha

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Abstract
Heart rate is a major determinant of cardiac output, myocardial oxygen consumption and coronary blood flow under physiological and pathological conditions. Resting heart rate is an easily accessible clinical parameter in medical practice. Stress is an important cause of increase in resting heart rate due to sympathetic overdrive. After qualifying through a tough competitive examination, successful candidates have got seats in government medical college of Baripada, Odisha. The MBBS course being lengthy and strenuous, added to the concept of studying in a newly built medical college, could be stress factors to the 1st batch of MBBS students. The resting heart rate of both groups (boys and girls) was recorded and subjected to appropriate statistical analysis. Higher resting heart rate values were observed in girls (80.1 ± 11.0 beats/min) compared to boys (75.9 ± 12.7 beats/min) ($p \leq 0.001$).

Keywords Resting heart rate, students, medical college

Introduction
Heart rate is a major determinant of cardiac output, myocardial oxygen consumption and coronary blood flow under physiological and pathological conditions. Experimental and clinical data have demonstrated that heart rate reduction is the main mechanism for reducing ischemia, improving left ventricular function, decreasing the risk of plaque rupture and post myocardial infarction mortality [1]. It predicts longevity and cardiovascular diseases, and current evidence suggests that it is also an important marker of outcome in cardiovascular disease, including heart failure [2]. The baroreflex mechanisms, by controlling autonomic outflow to the heart and circulation, contribute importantly to neural circulatory control. The main function of the baroreflex is to prevent wide fluctuations in arterial blood pressure and to maintain the physiological homeostasis under basal resting conditions and in response to acute stress. Baroreflex-mediated changes in autonomic outflow affect heart rate [3]. Resting heart rate is an important surrogate marker of exercise capacity [4] Resting heart rate is an easily accessible clinical parameter in medical practice. Stress is an important cause of increase in resting heart rate due to sympathetic overdrive.

After qualifying through a tough competitive examination, successful candidates have got seats in government medical college of Baripada, Odisha. The MBBS course being lengthy and strenuous, added to the concept of studying in a newly built medical college, could be stress factors to the 1st batch of MBBS students.

Hence the study was designed to record the resting heart rate of the willing students.

Materials and Methods
The study was conducted on the 1st batch of 1st semester students in Department of Physiology, PRM Medical College, Baripada, Odisha from November 2017 to January 2018. Informed consent was taken from the students. Anthropometric measures like height, weight were measured and clinical examination of cardiovascular and respiratory system were done. Those with high BMI, anemia or any cardiorespiratory abnormality were excluded from the study.

In a time when there were no part completion or semester examinations due, the subjects were asked to be comfortably seated in a quiet room, not too much artificially illuminated.

The preferred time was about 10 AM, at least 2 hours after the last meal. The subject was allowed to sit quietly for 20-30 minutes before reading his pulse for resting heart rate count. The resting heart rate of both groups (boys and girls) was recorded and subjected to appropriate statistical analysis. The data were recorded analysed on MS Excel. The resting heart rate of both groups was calculated as mean and standard deviation. Analysis was done using paired "t" test.

Result

After thorough clinical examination 78 students (50 boys and 28 girls) were included in the study. The resting heart rate value observed in girls was 82.7 ± 12.0 beats/min. In boys the value was 75.4 ± 12.2 beats/min. The higher resting heart rate value for girls was statistically very highly significant ($p \leq 0.001$). Both groups have resting heart rate greater than 70 bpm.

Discussion

Assessment of resting heart rate is frequently performed and is easy, reliable and inexpensive. Heart rate is used in many algorithms to assess the prognosis of acutely ill patients. Elevated resting heart rate is independently related to the development of type 2 diabetes, cardiovascular disease and premature all-cause mortality [5]. Elevated resting HR (>or= 70 bpm) is a strong independent predictor of clinical outcomes [6]. In our study both girls and boys have higher resting heart rates with reference to [6]. The girls have very highly significantly increased resting heart rate above boys. This raises an alarm due to its association with many diseases as risk factor [1, 2].

Conclusion

Higher resting heart rate values were observed in girls (80.1 ± 11.0 beats/min) compared to boys (75.9 ± 12.7 beats/min) ($p \leq 0.001$).

Future Study

The sample shall be followed up in two groups → one as control and the other with prescription for morning/evening walk to note for any change in resting heart rate.

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