Comparison Of Pulse Rate And Blood Pressure Before And After Examination In Medical Students

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ABSTRACT

Background: Education and training in medical colleges has always been regarded as highly stressful. The present study was conducted to assess pulse rate and blood pressure in medical students before and after examination.

Materials & Methods: 250 medical students of both genders were enrolled in the study and parameters such as height, weight, pulse rate, systolic blood pressure and diastolic blood pressure were entered in it before, during and after the examination.

Results: Out of 250 subjects, males were 115 and females were 135. mean age was 19.4 years, height was 160.2 Kgs and weight was 64.8 kgs. The mean pulse rate before examination was 76.1 beats/minutes, during exam was 76.8 beats/ minutes and after examination was 71.2 beats/min. The mean SBP 1 month before examination was 102.4 mm Hg, during examination was 136.8 mm Hg and after examination was 100.6 mm Hg. The mean DBP before examination was 72.8 mm Hg, during examination was 86.2 mm Hg and after examination was 70.6 mm Hg. The difference was significant ($P < 0.05$).

Conclusion: Both blood pressure and pulse rate were significantly rise before examination and fall after examination.

Key words: Blood pressure, Pulse rate, Examination

Introduction

Education and training in medical colleges has always been regarded as highly stressful. Medical students are usually under stress due to a variety of reasons like vast curriculum, academic competition, examinations etc. Many physiological studies have shown that stress from any source can influence on the endocrine, haemopoietic and immune systems. Many researchers have reported a relationship between stress and blood pressure.[1] In fact, the natural reaction of the cardiovascular responses to the stress is the increase in the heart rate. Stress of any form is known to produce definable mental and physiological reactions in the body like alterations in different biological functions especially the heart rate and blood pressure.[8] Stress, may it be emotional, physical or biological, evokes an integrated response of sympathoadrenal medullary system and hypothalamic– pituitary–adrenal cortex axis. Stress starts while the emotional, environmental, physical and social needs of the individuals compete with one another, and exceed the ability of the individual. Short-term stress (acute) increases the blood pressure.[2]

Stress, may it be emotional, physical or biological, evokes an integrated response of sympathoadrenal medullary system and hypothalamic– pituitary–adrenal cortex axis. To some extent stress in itself is helpful in coping with situations but too much of it can reduce the performance. As stress acts directly or indirectly upon brain stem, a great sympathetic discharge is induced at the level of spinal cord and terminal endings of the sympathetic nervous system.[3] The release of norepinephrine is the cause of arteriolar vasoconstriction raising peripheral resistance and that increases diastolic blood pressure.[4] The stressful life of the medical profession begins at the student level and it is crucial to monitor the stress level of students so as to recognize the transition of a person from the state of positive stress to negative stress. It is an imperative factor in students having poor adaptability and high reactivity to stress as they are prone to potentially serious outcomes.[5] The present study was conducted to assess pulse rate and blood pressure in medical students before and after examination.

Materials & Methods

The study was conducted among 250 medical students of both genders who agreed to participate in the study with their written consent.

Data such as name, age, gender etc. was recorded. A case history proforma was made and data such as height, weight, pulse rate, systolic blood pressure and diastolic blood pressure were entered in it before, during and after the examination. The blood pressure was recorded by Auscultatory method using mercury sphygmomanometer in sitting position. Three readings were recorded and mean was taken as final. Pulse rate was measured with radial artery. Results of the study were subjected to statistically analysis. P value < 0.05 was considered significant.

Results

Table I Distribution of patients

Total- 250		
Gender	**Males**	**Females**
Number	115	135

Table I shows that out of 250 subjects, males were 115 and females were 135.

Table II Recording of baseline characteristics

Parameters	Mean	SD
Mean age (years)	19.4	3.7
Height (cm)	160.2	5.3
Weight (Kgs)	64.8	7.9

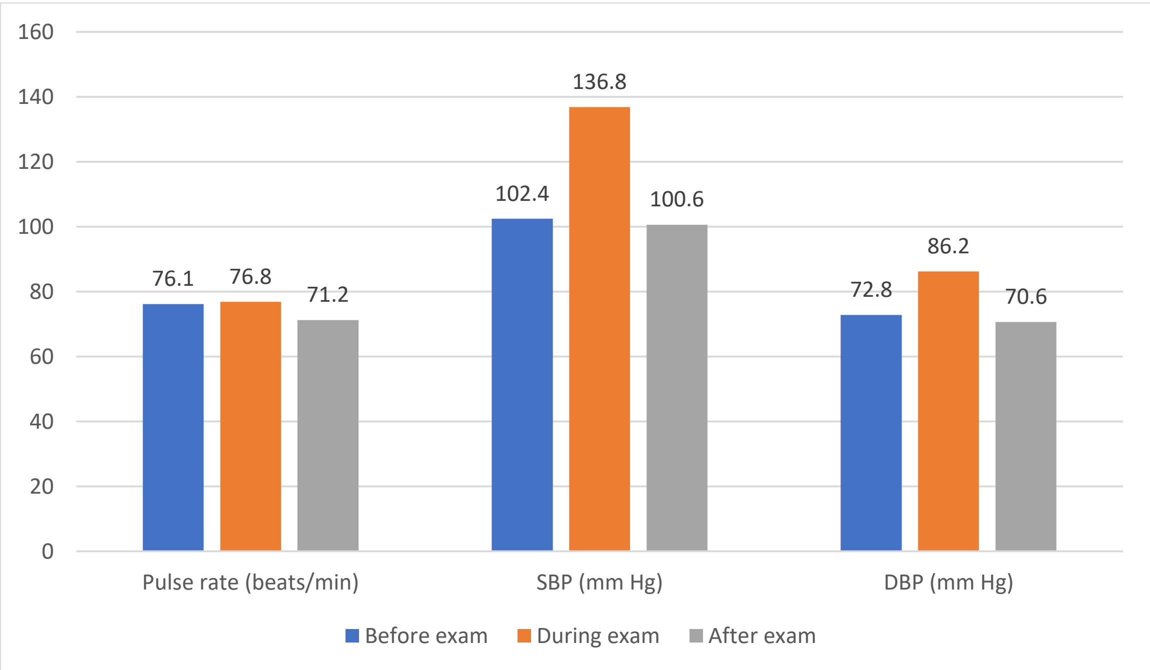
Table II shows that mean age was 19.4 years, height was 160.2 Kgs and weight was 64.8 kgs.

Table III Comparison of parameters

Parameters	Before exam	During exam	After exam	P value
Pulse rate (beats/min)	76.1	76.8	71.2	0.01
SBP (mm Hg)	102.4	136.8	100.6	0.02
DBP (mm Hg)	72.8	86.2	70.6	0.05

Table III, graph I shows that mean pulse rate before examination was 76.1 beats/minutes, during exam was 76.8 beats/ minutes and after examination was 71.2 beats/min. The mean SBP 1 month before examination was 102.4 mm Hg, during examination was 136.8 mm Hg and after examination was 100.6 mm Hg. The mean DBP before examination was 72.8 mm Hg, during examination was 86.2 mm Hg and after examination was 70.6 mm Hg. The difference was significant ($P< 0.05$).

Graph I Comparison of parameters



Discussion

The monitoring of stress levels of students is critically vital around their examinations, in order to recognize students having an abnormally increased level of stress who are susceptible to complications of negative stress.[6,7] Pre-examination stress is one of the most widely suffered problems in medical students throughout the world.[8] It is a feeling of pressure tension that many medical students feel before and coming up to academic examination time.[9] The stimulation of the adrenergic nervous system that leads to release of catecholamine in particular noradrenaline at the post synaptic neuron and adrenaline or epinephrine from adrenal medulla that result in activation of α1, β1 and β2 receptors consequently elevation of systolic blood pressure.[10] The present study was conducted to assess pulse rate and blood pressure in medical students before and after examination.

We found that out of 250 subjects, males were 115 and females were 135. Fatima et al[11] assessed the cardiovascular status of medical students by measuring their heart rate and blood pressure before, during and after the examination. A total of 124 first year MBBS students were selected comprising of 62 males and 62 females were recorded. All the subjects were examined two months prior to the internal assessment examination and again 2 days prior to and one month after the internal assessment examination. Mean pulse rate was high in students during examination as compared to before and after examination. More students had SBP in the range of 120-129 mm Hg during examination as compared to 100-109 mm Hg before examination.

We observed that mean age was 19.4 years, height was 160.2 Kgs and weight was 64.8 kgs. Singh et al[12] in their study 120 first year medical students were recruited. Parameters such as height, weight, pulse rate, systolic blood pressure and diastolic blood pressure were recorded before, during and after the examination as per WHO standards. Out of 120 subjects, males were 55 and females were 65. The mean SBP in males before, during and after examination was 110.2 mm Hg, 124.8 mm Hg and 126.2 mm Hg respectively. In females, it was 106.4 mm Hg, 128.2 mm Hg and 130.4 mm Hg respectively. The mean DBP (mm Hg) in males before, during and after examination was 74.2, mm Hg, 80.4 mm Hg and 86.2 mm Hg respectively. In females, it was 72.8 mm Hg, 82.4 mm Hg and 88.2 mm Hg respectively.

We found that mean pulse rate before examination was 76.1 beats/minutes, during exam was 76.8 beats/ minutes and after examination was 71.2 beats/min. The mean SBP 1 month before examination was 102.4 mm Hg, during examination was 136.8 mm Hg and after examination was 100.6 mm Hg. The mean DBP before examination was 72.8 mm Hg, during examination was 86.2 mm Hg and after examination was 70.6 mm Hg. Acharya et al[13] found that the mean value of pulse in pre- examination recording (83.22) is higher than the mean value of post examination (78.68). The difference of mean of pulse rate was significant between the values of pre- examination and post examination recordings. The mean value of SBP in pre-examination recordings (123.6) is higher than the mean value of post examination (120.9). The difference of mean of SBP was significant between the values of pre- examination and post recordings.

Pratima et al[14] assessed the effect of pre-examination stress on autonomic functions like pulse rate and blood pressure in the first M.B.B.S. students. Among 100 subjects, 45 students were males, 55 students were females. Their arterial blood pressure and pulse rate were measured one month prior to examination and again one week before examination. In the present study, the results were consistent with early clinical studies reporting that there is increase in pulse rate, systolic blood pressure, diastolic blood pressure, one week before examination compared to values of one month before examination. Majority of the students were under stress prior to examination. Stress produced a significant increase in the pulse rate, systolic blood pressure and diastolic blood pressure among the students. Relaxation techniques like meditation, yoga, breathing exercises, appropriate diet and physical exercises can be recommended to students.

Conclusion

Authors found that both blood pressure and pulse rate was significantly rise before examination and fall after examination.

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