

Assessment of cardiovascular status of medical students during and after the examination

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ABSTRACT:

Background: Stress starts while the emotional, environmental, physical and social needs of the individuals compete with one another, and exceed the ability of the individual. The present study was conducted to assess cardiovascular status of medical students during and after the examination.

Materials & Methods: 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.

Results: Out of 120 subjects, males were 55 and females were 65. The mean SBP (mm Hg) in males before, during and after examination was 110.2, 124.8 and 126.2 respectively. In females, it was 106.4, 128.2 and 130.4 respectively. The mean BBP (mm Hg) in males before, during and after examination was 74.2, 80.4 and 86.2 respectively. In females, it was 72.8, 82.4 and 88.2 respectively.

Conclusion: Systolic blood pressure and diastolic blood pressure showed statistically significant increase during examination and after examination.

Key words: Systolic blood pressure, diastolic blood pressure, Medical.

INTRODUCTION

One of the important sources of examination stress in students is the great expectation of parents for achieving good marks in their examination. In recent time, there have appeared several news regarding the increasing suicide rate among students of as young age as 18 year old.¹ Many researchers have reported a relationship between stress and blood pressure. In fact, the natural reaction of the cardiovascular responses to the stress is the increase in the heart rate.² 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. Medical students undergo tremendous stress during various type stages of the MBBS course.³ The main cause of stress is adapting to new life, which they suddenly landed in abrupt changes from high school to college and new advancements has also added to the burden of medical students. In a medical student, the

situation is aggravated by the added pressure to secure better grades than his securing residency program of his choice.⁴

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. The release of norepinephrine is the cause of arteriolar vasoconstriction raising peripheral resistance and that increases diastolic blood pressure.⁵The present study was conducted to assess cardiovascular status of medical students during and after the examination.

MATERIALS & METHODS

The study was conducted among 120 first year medical students of both genders All were informed regarding the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. 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. The body mass index and waist hip ratio were calculated. The blood pressure was recorded by auscultatory method using mercury sphygmomanometer in sitting position. Body mass index was calculated by dividing weight (kg) by height squared (m^2). Results were statistically analyzed. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 120		
Gender	Males	Females
Number	55	65

Table I shows that out of 120 subjects, males were 55 and females were 65.

Table II Assessment of systolic blood pressure (SBP)

SBP (mm Hg)	Males	Females	P value
Before	110.2	106.4	0.12
During	124.8	128.2	0.15
After	126.2	130.4	0.21

Table II, graph I shows that mean SBP (mm Hg) in males before, during and after examination was 110.2, 124.8 and 126.2 respectively. In females, it was 106.4, 128.2 and 130.4 respectively. The difference was non- significant ($P > 0.05$).

Graph I Assessment of systolic blood pressure (SBP)

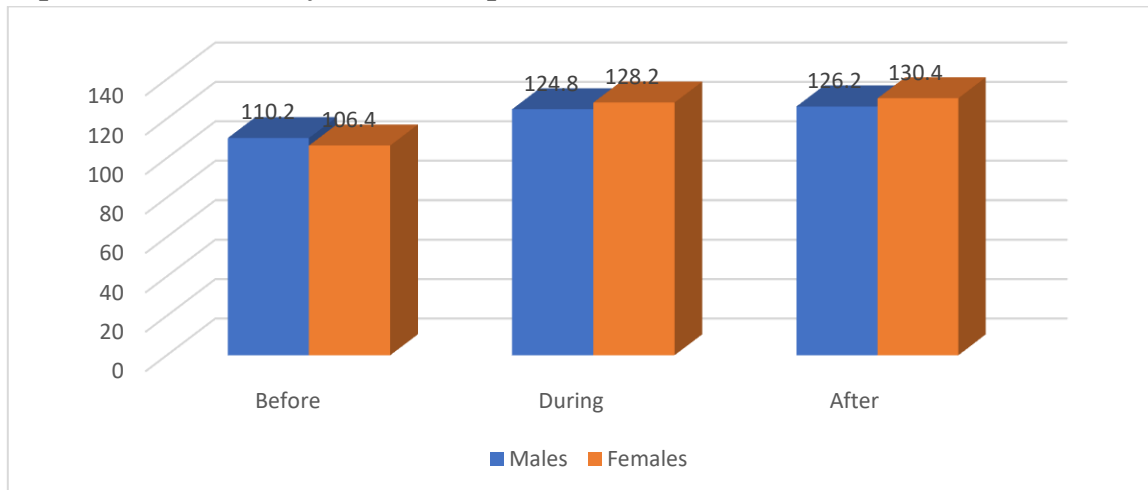
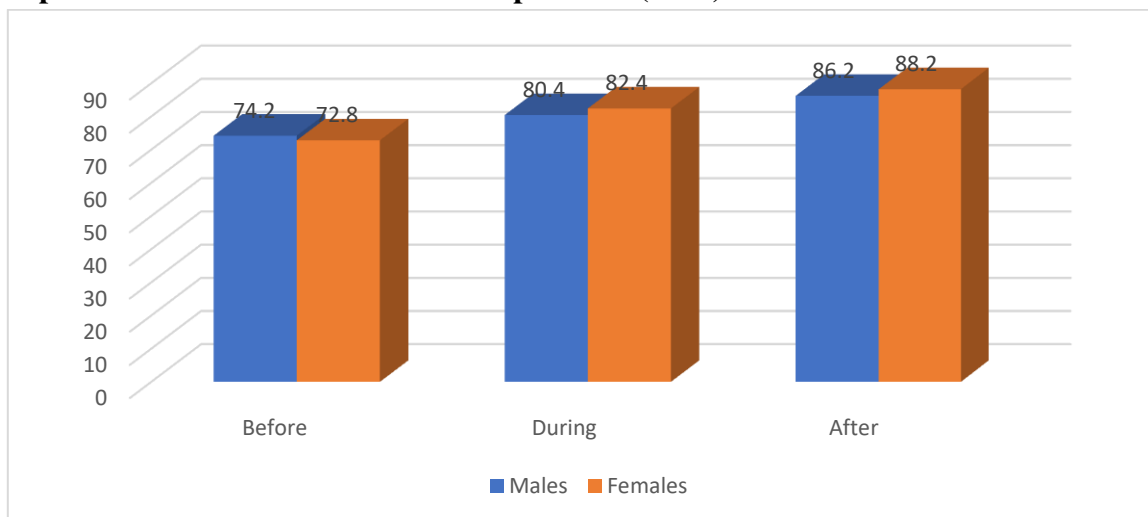


Table III Assessment of diastolic blood pressure (DBP)

DBP (mm Hg)	Males	Females	P value
Before	74.2	72.8	0.15
During	80.4	82.4	0.17
After	86.2	88.2	0.24

Table II, graph I shows that mean BBP (mm Hg) in males before, during and after examination was 74.2, 80.4 and 86.2 respectively. In females, it was 72.8, 82.4 and 88.2 respectively. The difference was non- significant ($P > 0.05$).

Graph II Assessment of diastolic blood pressure (DBP)



DISCUSSION

The pre- examination anxiety and fear are accompanied by change in the number of different physiological parameters. Examination stress is a feeling of tension that many medical students feel before and coming up to examination time.⁶ It usually occurs during the revision period before examinations and immediately before and during examination.⁷ Though

moderate amount of stress is essential for maintaining motto for better performance and preparation in examination, extreme stress can be harmful to body and mind.⁸ This study supports many findings of the previous studies in that majority of the medical students experience some levels of anxiety before examinations.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 α_1 , β_1 and β_2 receptors consequently elevation of systolic blood pressure.¹⁰ The present study was conducted to assess cardiovascular status of medical students during and after the examination.

In present study, out of 120 subjects, males were 55 and females were 65. Fatima et al¹¹ evaluated 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. Student's height, weight, pulse rate, systolic blood pressure and diastolic blood pressure 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 and standard deviation (SD) was calculated. Mean pulse rate (beats/minute) was high in students during examination as compared to before and after examination. More students had SBP in the range of 120-129 mmHg during examination as compared to 100-109 mmHg before examination. There was not much change in DBP among students before, during or after examination.

We found that mean SBP (mm Hg) in males before, during and after examination was 110.2, 124.8 and 126.2 respectively. In females, it was 106.4, 128.2 and 130.4 respectively. We found that mean BBP (mm Hg) in males before, during and after examination was 74.2, 80.4 and 86.2 respectively. In females, it was 72.8, 82.4 and 88.2 respectively. Acharya et al¹² 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. ($p < 0.0001$). The mean value of DBP in pre- examination recording (81.44) is higher than the mean value of post examination (80.92). The difference of mean of SBP was not significant between the values of pre- examination and post examination ($p = 0.0571$). Al-Zamely¹³ observed that heart rate, systolic blood pressure and neutrophils count increased significantly during academic examination in all student groups while other hematological parameters did not reveal any significant changes.

CONCLUSION

Authors found that systolic blood pressure and diastolic blood pressure showed statistically significant increase during examination and after examination.

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