Evaluation Of Examination Stress In I MBBS Medical Students

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Abstracts: <u>Background :</u> As academic examination stresses are associated with changes in the mental and physical health such as increasing anxiety, increasing negative mood. <u>Objective :</u> The objectives for the study were to assess anxiety and sympathetic activity using TMAS and CPT respectively one month before examination and hour before examination .Both these parameters were compared and analysed. <u>Method:</u> Parameters were recorded with the help of Taylor manifest anxiety scale questionnaire and cold pressor test. Students were subjected to the tests between 9:30 to 10:30am one month prior to examination and one hour prior to preliminary practical examination in Physiology. Collected data was analysed using MW test and paired 't'test. <u>Result :</u> It was observed that students were having high level of anxiety even before one month of examination. Approximately 64 % of males and 53% of females were having high anxiety one month before examination. However, only 54% males and 53% females were having high anxiety one hour prior to examination. Another finding was increase in systolic and diastolic BP one hour before to examination compared to one month before examination, though the difference was not statistically significant. **Conclusion**: It is evident from the study that thought the results are not statistically significant basal increase in anxiety score indicates that medical students exhibit higher anxiety levels even in the absence of examination. [Kharche J S et al NJIRM 2012; 3(5) : 27- 31]
Key Words: Examination Stress, Anxiety Score, Cold Presser Test, Medical Student.

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Introduction: Stress is an extremely adaptive phenomenon in human, contributing to anyone's survival, activities and performance[1]. It is something that we all experience at times. Many aspects of university life have the potential to cause stress, including adjusting to a new environment, fulfilling academic requirements, financial pressures, developing friendships etc. Test anxiety is one of the fundamental problems that students face. It may cause negative effect on their academic performance.

Anxiety due to academic examinations have often been used in stress research because they are predictable, standardized and discrete examples of real-life stressors that induces a significant neurohormonal changes.[2,3,4]

Psychological or subjective assessments for anxiety can be done using simple questionnaire like Taylor Manifest Anxiety Scale (TMAS) .Psychological stressors alter blood pressure induced by the cold pressor test.[5] (CPT) which is used as objective measure of stress. Stress is not necessarily harmful. Mild form of stress during examination period can motivate and energise a person. Slightly increased stress levels may make you more alert and motivated to do your work.

However, if stress level is too high then it may cause decrease in examination performance. Examination stress is characterized by a diffuse set of negative emotional symptomatology and a high degree of worry, related to possible bad performance and its consequences. Academic examination stresses are associated with changes in the mental and physical health such as increasing anxiety, increasing negative mood and changes in the immune functioning[6]. MBBS students are at more stress as they are exposed to professional course first time in their life with lot of expectations. Present study is planned to evaluate examination stress using the subjective and objective assessment tests in I MBBS students.

Material and Methods: It is a prospective observational study conducted in Bharati Vidyapeeth Deemed University Medical College, Pune. Ethical committee approval was obtained for the project. 60 1st MBBS students (30 females & 30 males) between the age group of 18-25 years were subjected for the tests between 9:30 to 10:30am one month prior to examination and one hour prior to preliminary practical examination in Physiology. Nature of the study and the purpose of the study was explained to all the volunteers

and informed consent was obtained. Students with presence of any acute or chronic disease, taking any medication, habit of smoking or alcohol consumption, unwilling students are excluded from the study. There were two steps involved in data collection

Step I - Use of Taylor manifest anxiety scale[7] (TMAS): To assess the extent and source of any possible stress, all the participants were asked to complete Taylor manifest anxiety scale questionnaire. It was a fifty items, self-report questionnaire to assess anxiety. True-false responses were used for each item and the replies indicating anxiety were counted, giving a score from 0 to 50. Higher score represented higher level of anxiety. It was administered one month prior to examination & one hour before examination. Time required to administer the questionnaire was 10-15 minutes.

Interpretation of TMAS[8]: Depending upon the score obtained TMAS can grade anxiety as given as follows:-

TMAS Score	Interpretation
≤ 9	Low
10 – 15	Moderate
≥16	High

Step II - Use of cold pressor test [9] (CPT): After filling the anxiety questionnaire cold pressor test was performed. Instruments used: - Digital Sphygmomanometer, thermometer for measurement of water temperature. We recorded resting values (after giving 10 minutes of rest) of the heart rate and blood pressure by digital Sphygmomanometer cuff on right hand. Then the subject was asked to immerse left hand upto first palmar crease in cold water (4^0C ±0.5^0C temperature) for 1 minute. BP and heart rate were recorded at the end of one minute & five minutes after immersion in cold water. Cold pressor test was interpreted as : Increase in systolic blood pressure > 20 mm Hg and/or increase in diastolic blood pressure > 10 mm Hg indicated increased sympathetic activity.

Statistical Analysis : Responses of Taylor manifest anxiety scale questionnaire were analysed by using Mann–Whitney (MW) test. Cold pressor test was analysed using paired ' t ' test .

Result: In the study group, average age of males is 18.26 ± 0.81 and average age of females is 18.43 ± 0.57.

Table no 1 shows gender wise distribution of students according to anxiety

TMAS	Male		Female	
	One hour before examination	One month before examination	One hour before examination	One month before examination
Low (≤ 9)	4 (12.9)	4 (12.9)	7 (23.33)	8 (26.67)
Moderate(10-15)	9 (32.26)	6 (22.58)	7 (23.33)	6 (20)
High (≥16)	17 (54.84)	20 (64.52)	16 (53.33)	16 (53.33)
Total	30 (100)	30 (100)	30 (100)	30 (100)

Table no 2 shows increase in anxiety level one hour before examination

Subjects	TMAS Mean ± SD		MW test Z	P Value
	One month before examination	One hour before examination		
Male (n=30)	18.06 ± 8.39	18.55 ± 8.13	0.42	>0.05
Female (n=30)	16.33 ± 8.42	16.93 ± 8.53	0.52	>0.05

Discussion: Stress system is tonically active in every individual. Physical and emotional stressors that exceed a critical threshold can increase activity of stress system further. The hypothalamic-pituitary-adrenal (HPA) axis and the sympathetic and adrenomedullary systems are the peripheral limbs of the stress system. Thus, stress

results in prolonged stimulation of sympathetic activity and cortisol secretion.

Table no 3 shows increase in systolic blood pressure at rest, one minute and five minute after cold pressor test, one hour before examination in males but it is not statistically significant.

	SBP(Males)		t value	P value
	One month before examination	**One hour before examination**		
Resting	123.97 ± 11.65	125.32 ± 10.19	0.61	>0.05
After 1 min of CPT	127.74 ± 10.95	127.74 ± 12.29	0	>0.05
After 5 min of CPT	120.87 ± 9.78	122.32 ± 11.35	0.52	>0.05

Table no 4 shows increase in systolic blood pressure at rest, one minute and five minute after cold pressor test , one hour before examination in females but it is not statistically significant.

	SBP(Females)		t value	P value
	One month before examination	**One hour before examination**		
Resting	108 ± 10.10	110.73 ± 12.47	1.13	>0.05
After 1 min of CPT	109.17 ± 9.8	113.03 ± 13.03	1.41	>0.05
After 5 min of CPT	105.33 ± 8.83	108.2 ± 10.36	1.43	>0.05

Table no 5 shows increase in diastolic blood pressure at rest, one minute and five minute after cold pressor test, one hour before examination in males but it is not statistically significant.

	DBP(Males)		t value	P value
	One month before examination	**One hour before examination**		
Resting	73.8 ± 9.76	79.45 ± 9.98	1.36	>0.05
After 1 min of CPT	76.65 ± 10.22	77.48 ± 10.22	0.39	>0.05
After 5 min of CPT	73.68 ± 8.91	73.97 ± 7.22	0.16	>0.05

Table no 6 shows increase in diastolic blood pressure at rest, one minute and five minute after cold pressor test, one hour before examination in females but it is not statistically significant.

	DBP(Females)		t value	P value
	One month before examination	**One hour before examination**		
Resting	68 ± 7.54	70.83 ± 7.86	2.01	>0.05
After 1 min of CPT	69.5 ± 7.71	74.47 ± 14.6	1.99	>0.05
After 5 min of CPT	69.27 ± 6.11	69.6 ± 7.08	0.31	>0.05

This study has demonstrated some established physiological phenomena: males show significantly higher systolic blood pressure at rest probably due to higher cardiac output & increased blood volume.

Another remarkable revelation is many students are having high level of anxiety even one month before examination as shown in table no 1 and 2. This could be due to higher number of stressors experienced by medical students.

Higher anxiety scores in both male and females are observed 1 hour before examination but the difference is not statistically significant. It is likely that if we had taken first reading six months prior to the examination then the difference in anxiety scores would have been more.

S N Bazmi Inam[10] has noted prevalance of anxiety in females to be 89.7% and males 60% in 1st year medical students of Saudi Arabia. Similar findings were noted from other studies conducted at western medical school as well as other Asian and African medical schools using different screening tools.[11-17] While some studies have found little or no evidence of stress among medical students.[18,19]

Stress is known to cause increase in sympathetic activity. As CPT is a sensitive test of sympathetic activity, there are many studies showing abnormal CPT and stress[20,21]. Regarding CPT as shown in table no 3 and 4 ,we have recorded higher systolic BP at one minute and five minutes one hour

before to examination in our subjects as compared to one month before examination.

As shown in tables 5 and 6 we have also recorded, in our subjects, higher diastolic BP at one minute and five minutes of CPT one hour before examination as compared to one month before examination. But this increase in systolic BP and diastolic BP is not statistically significant.

It is likely that if we had taken first reading six months prior to the examination higher increase in systolic BP and diastolic BP could have been there.

Our study demonstrates the co-relation between the subjective measure of stress (TMAS) and objective measure of stress (CPT).

We have found that as a result of examination stress subjects have shown increase in anxiety (as assessed by TMAS) and increased sympathetic activity (as studied by CPT) .Recent study [22] also demonstrate that decrease in GABA levels are associated with widespread anxiety disorders. Therefore, these parameters can be used to assess anxiety in medical students which can help to form strategies to cope with stress. To further authenticate this study , additional parameters like serum cortisol level,VMA levels can included.

Small sample size, shorter time period between the two readings, Blood and urine markers of sympathetic activity like cortisol and VMA(Vanillyl mandelic acid) not studied are limitations of the study.

As noted by many researchers [23,24,25] medical students are exposed to various stressors. If pathological levels of stress is detected early then definitive measures can be advised and practiced to reduce it. This will prevent harmful effects of stress on body functions as discussed earlier. Students who are bearing high stress can be segregated and can be recommended relaxation techniques like meditation, yoga, breathing exercises, appropriate diet and physical exercise.

This can prevent stress induced disorders in future life.

Conclusion: It is evident from the study that thought the results are not statistically significant basal increase in anxiety score indicates that medical students exhibit higher anxiety levels even in the absence of examination.

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