



ORIGINAL ARTICLE

Examination stress: Effects on Quantitative Platelet count in medical students at Peoples University of medical and health sciences for women, Nawabshah.

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ABSTRACT... Objective: To evaluate the examination stress on Quantitative Platelet count in medical students at Peoples University of medical and health sciences for women, Nawabshah. **Study Design:** Cross-sectional Comparative study. **Setting:** Department of Physiology, Peoples University of Medical & Health Sciences for Women, Shaheed Benazir Abad. **Period:** April to October 2019. **Material & Method:** A randomized selection of female students from Peoples University of medical and health sciences for women, Nawabshah was done. Blood samples were taken before and during the exams after a preliminary medical checkup, students with fever or with other infections at the start of the study were not allowed to participate. Finally 110 students were included and two groups were made each consists of 55 students each from first year and second year MBBS class. Estimation of platelets count was carried out thru complete blood count test. **Results:** Laboratory results of platelet count showed, mean Platelet Count \pm SD before examination of all students including first year was $295961.81 \pm 68964.71\%$. become $311000.0 \pm 83017.84\%$ during exam, which was higher as compared to before examination mean Platelet Count \pm SD was There was highly significant increase of Platelet Count during examination as compared to before examination among the students of first year ($n = 55$, p value = <0.0001), whereas In this study, mean Platelet Count \pm SD before examination of all students including second year was $297790.0 \pm 72794.78\%$. increased during exam to $326641.81 \pm 80963.01\%$ which was higher as compared to before examination mean Platelet Count \pm SD was There was highly significant increase of Platelet Count during examination as compared to before examination among the students of second year ($n = 55$, p value = <0.0001). **Conclusion:** This study concluded that examinations in medical schools are stressful enough to produce changes in blood cells parameters which include Platelet count and increased the levels.

Key words: Platelet count, Examination Stress, Medical students.

INTRODUCTION

In the year 1956, the term stress was described by Hans Selye, known as the father of stress studies: "It's not necessarily a poor thing – it all relies upon how you handle it". It is supportive to push stress on motivational work, whereas that of disappointment, frustration, or contamination is destructive. "Stress is described as the difference in environment and people's capacity to adapt appropriately. Stress may be austerity or trouble.¹ Eustress is excellent stress ; it is a dynamic stress that encourages an individual to continue functioning in the best possible way when that stress is no longer manageable than stress is overcome or trouble.²

Stress is very common and fourth major cause for disease affliction and weakness, according to the WHO estimates.³ Students in medicine are precious resources for the human future and depression adversely impacts patient care, reduces quality of life, and reduces production and teaching difficulties.⁴

The potential effects of poor stress can be: heated, tense, loose, readily dull, frightened or troubled. Inadequate stress can contribute sometimes to a large number of psychological disorders, such as dejection, fear, drug abuse and even suicide.⁵ Excessive data burdens leave little chance for relaxation and recreation, and sometimes lead

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to severe sleep deprivation.⁵ It provides several stressors that can trigger damage to judgment, reduced attendance, absence of trust, fear and depression.⁶ Interestingly Linn & Zeppa have proposed that some stress is required to learn in medical schools.^{7,8}

Stress can affect all the physiological systems of the body, mostly the CNS, and CVS at the high risk, hematological parameters are affected due to release of cytokines, inflammatory mediators from the adrenals. Platelets are responsible for the blood clotting mechanism of body.⁹ decrease platelet count causes the bleeding and increase level cause the most dangerous situations like from DVT to MI and stroke.¹⁰ If stress causes so it is somewhat more dangerous for student's life and for anyone. Previous studies on medical student also showed that examination stress causes the increase levels of platelet count. Causes are tough curriculum, large syllabus, and multiple exam steps.¹¹

MATERIAL & METHODS

This research was cross sectional comparative study, conducted at Department Physiology, Peoples University of Medical & Health Sciences for Women, Shaheed Benazir Abad. The research study approved and accepted by Ethical Review Committee of PUMHSW-SBA. Normal female junior students of MBBS (First & second year) were included comprises of total 110 numbers, then two groups A (first year) and (second year) were made each of 55 students, During pre-exam and post exam period, blood samples were taken mostly from median cubital vein and samples for quantitative platelet count were got

analyzed on from laboratory of PUMHSW- SBA After the collection of the data, it was analyzed by SPSS version 23. All the continuous variables were analyzed by the t-test for mean standard deviation. All the numerical variables were analyzed by Student's t test. Final results were presented by using tables, graphs, and charts.

RESULTS

A total of 110 samples of female MBBS students were enrolled, with a mean age \pm SD of 18.8 ± 0.92 years. The least age of undergraduate students was 17 years and the max age was 21 years.

Effect of Examination Stress on Platelet Count

In this study, mean Platelet Count \pm SD during examination of all students including first year was 311000.0 ± 83017.84 percentage which was higher as compared to before examination mean Platelet Count \pm SD was 295961.81 ± 68964.71 percentage. There was highly significant increase of Platelet Count during examination as compared to before examination among the students of first year ($n = 55$, p value = <0.0001) see Table-I.

In this study, mean Platelet Count \pm SD during examination of all students including second year was 326641.81 ± 80963.01 percentage which was higher as compared to before examination mean Platelet Count \pm SD was 297790.0 ± 72794.78 percentage. There was highly significant increase of Platelet Count during examination as compared to before examination among the students of second year ($n = 55$, p value = <0.0001) see Table-I.

Platelet Count (cell/microliter)	Before Examination	During Examination	P-Value
First year ($n = 55$)	295961.81 ± 68964.71	311000.0 ± 83017.84	0.0001**
Second year ($n = 55$)	297790.0 ± 72794.78	326641.81 ± 80963.01	0.0001**

Table-I. Comparison of Mean value of Platelet Count (cell/microliter) MBBS students before and during examination (n = 110)

Results are presented as Mean \pm Standard Deviation

**P value is highly significant (student's t test)

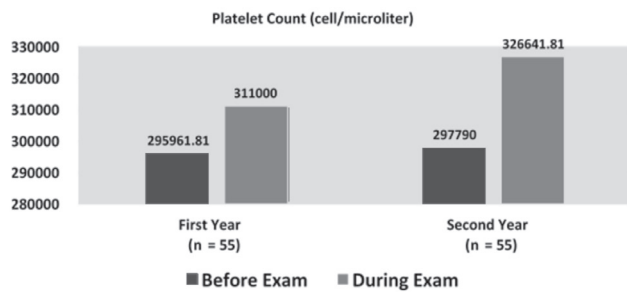


Figure-1. Comparison of Mean value of Platelet Count (cell/microliter) of MBBS students before and during examination

DISCUSSION

Stress is characterized as a feeling of fear or anxiety. A disposition known as anxiety may be characterized by emotions of impending danger, pressure, and difficulty as well as tendencies to avoid or flee. The human experience includes anxiety in many different ways related to danger, ongoing issues, life transitions, and obstacles. Life would be much simpler if our needs could always be satisfied.

Stress is a major psychobiological process that causes a wide range of physiological responses depending on the stressor.¹² Stress is defined as “a cascade of neuro hormonal and metabolic reactions to unpredictable and uncontrollable conditions,” which “leads to rapid sympathetic nervous system activation and slightly faster hypothalamus pituitary adrenal axis activation.”¹³

Leucocyte trafficking is hypothesized to be regulated and redistributed among the blood and other immune compartments by endocrine hormones produced during stress. The activation of the sympathetic nervous system might be important. Norepinephrine and epinephrine are two stress hormones that have receptors on lymphocytes and monocytes.¹⁴ Therefore, stressful circumstances may have an impact on immunological function.¹⁵ A decrease in lymphocytes and basophils in the individuals in this study altered their immunological function, verifying the changes associated with stress that have been reported in the literature. Stress related to academic exams significantly affects erythron factors. Hemoglobin production is increased, which cannot be explained by fluid shifting

out of the intravascular region, concentrating non-diffusible blood components, leading to an increase in the number of red blood cells. Furthermore, it has been proposed that stress-induced pro-inflammatory cytokine secretion promotes hemopoietic cell proliferation.¹⁶

Hemoglobin, red blood cells, and other indicators were not significantly altered, according to Qureshi et al. Our findings contradict the findings of the previous. 5 paper, which showed a rise in platelet counts. Maes et al.¹⁷ explored the effect of consider stress on hematological measures and found that exam stress raised hematocrit, Hb, MCV, MCH, and MCHC essentially. It has been proposed that stress-induced cytokine generation stimulates hematopoietic cell growth.¹⁸ Rise in neutrophils, platelets, PCVs, and MCV taking after a stressor can be clarified by hemoconcentration, which is actuated by fluid exchanges from intravascular to extravascular regions, concentrating in non-diffusible blood components.¹⁹ Jern et al¹⁸ discovered a considerable increase in platelets during psychological stimulation. Other stressors, such as physical exertion and adrenaline infusion, have also been linked to an increase in platelet counts.¹⁹ The level of neutrophils and platelets has been dramatically lowered when compared to pre-intervention examination stress levels. The level was further reduced after 6 weeks of practice. This alleviation may cease platelet release mediated by the alpha adrenergic system.

CONCLUSION

This study concluded that medical students are under tremendous stress during their examination. Stress significantly affected the Platelet count and increased the levels. Further sophisticated research with special technology is required to evaluate the cause of these effects.






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