Original research article

Correlation of psychological morbidity with ABO blood groups among undergraduate medical students

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Abstract

Introduction: A study found that more than half of the medical undergraduate students were found to be affected by depression, anxiety and stress. Depression is a serious and often under estimated, mental disease that affects both mind and body. High levels of stress in medical students not only effect their academic performance but also affect their health conditions. Students experiencing test anxiety may do poorly on an exam even if they know the material better than a classmate

Aim and objectives: To find prevalence of psychological morbidity i.e. stress, anxiety and depression among medical undergraduates and to find out correlation of psychological morbidity with different blood groups among medical undergraduates

Methodology: A cross sectional study was conducted among 100 first year medical students in NMCH, Sasaram. It was a questionnaire-based study, completely based on voluntary participation and students was free to withdraw from the study at any point or stage. Before administering the questionnaire, the nature of the study was explained to the students in detail. DASS 42 scale was used to assess depression, anxiety and stress.

Results: In our study we used DASS42 scale and mean Depression score were 8.33 ± 1.804, mean anxiety score were 10.46 ± 2.464 and Stress score were 12.38 ± 3.314. When we study the association of blood group on depression, anxiety and stress score by applying ANOVA test we found very significant association between blood group to Depression, anxiety and stress score

Conclusion: The results of our study indicate that subjects with blood group "O" perceived more depression, anxiety, and stress as compared to subjects of other blood groups and lowest among blood group AB then A and B blood group..

Keywords: Blood group, DASS 42 scale, medical undergraduate, depression, anxiety

Introduction

The aim of medical education is to graduate professional, skilful, and knowledgeable physicians. The medical school curriculum has been developed to accomplish these objectives. However, at the same time, life in medical schools has always been regarded as highly stressful. Some aspects of training may have unintended negative effects on the psychological and physical well-being of the medical students that can undermine these values. This stressful environment will eventually result in poor academic performance, psychological or emotional impairment during professional life, and therefore affect the quality of patient care [1].

A study found that more than half of the medical undergraduate students were found to be affected by depression, anxiety and stress. Depression is a serious and often under estimated, mental disease that affects both mind and body. High levels of stress in medical students not only effect their academic performance but also affect their health conditions. Students experiencing test anxiety may do poorly on an exam even if they know the material better than a classmate [2].

Depression is a common mental disorder that presents with depressed mood, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, low energy, and poor concentration. Hence, depression is associated with a constellation of psychological, behavioural, and physical symptoms. Anxiety

is a psychological disorder that is associated with significant suffering and impairment in functioning. It is a blend of thoughts and feelings characterized by a sense of uncontrollability and unpredictability over potentially aversive life events. Stress, on the other hand, is a consequence of or a general response to an action or situation that places special physical or psychological demands, or both on a person. As such, stress involves an interaction of the person with the environment[3].

The ABO blood group system has come to grow in complexity over the years.Past research has associated ABO blood type and mental stress. Neumann *et al.*, [4]studied the effects of blood type (A vs. O) coupled with a mirror drawing stressor on very low-density lipoprotein (LDL) toxicity and plasma cortisol levels. Chaudhuri A *et al.*, [5]indicated that subjects with blood group O perceived more stress as compared to subjects of blood group A.Clinical studies have identified a relationship between blood group and mental disorders.

However limited literature is available and the associations of blood group and stress are weak-many alternative factors are untouched. Still, the very fact that shows affiliation might exist intrigues some scientists, hope someday to uncover the biological processes that link blood molecules to mental state, presumably up our understanding and treatment of those sicknesses.

Keeping above facts, we had conducted this study to find correlation of psychological morbidity with different blood groups among medical students. This was an innovative study as very few study had done in Indian setting.

Aims and Objective
1. To find prevalence of psychological morbidity i.e. stress, anxiety and depression among medical undergraduates.
2. To find out correlation of psychological morbidity with different blood groups among medical undergraduates.

Material and Methods
A cross sectional study was conducted among 100 first year medical students in NMCH, Sasaram. It was a questionnaire-based study, completely based on voluntary participation and students was free to withdraw from the study at any point or stage. Before administering the questionnaire, the nature of the study was explained to the students in detail. Verbal consent were taken from all the participants and complete confidentiality was assured. Ethical committee approval was taken prior to the study.

We used DASS (Depression, Anxiety and stress Scale) in its original version[6].Any difficult terminology was duly clarified. The DASS is a 42-item questionnaire which includes three self-report scales designed to measure the negative emotional states of depression, anxiety and stress. Each of the three scales contains 14 items, divided into subscales of 2-5 items with similar content. The Depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia and inertia. The Anxiety scale assesses skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The Stress scale (items) is sensitive to levels of chronic non-specific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable/over-reactive and impatient. Respondents were asked to use 4-point severity/frequency scales to rate the extent to which they have experienced each state over the past week. Scores of Depressions, Anxiety and Stress were calculated by summing the scores for the relevant items. The depression scale items are 3, 5, 10, 13, 16, 17, 21, 24, 26, 31, 34, 37, 38, 42. The anxiety scale items are 2, 4, 7, 9, 15, 19, 20, 23, 25, 28, 30, 36, 40, 41. The stress scale items are 1, 6, 8, 11, 12, 14, 18, 22, 27, 29, 32, 33, 35, 39. The score for each of the respondents over each of the sub-scales, are then evaluated as per the severity-rating index of DASS scoring.

Blood groups of the subjects were assessed. Blood groups were collected from past medical records during admission and reconfirmed during the blood grouping, practical classes. Blood samples were taken by finger pricks by the students and the open slide method of ABO blood groups testing was followed. RBCs suspended in isotonic saline were treated with anti-A, anti-B and anti-D antisera on glass slides and mixed with separate applicator sticks. The mixture was observed for agglutination with corresponding antisera and compared with the control for confirmation[7]. Uncertainty were clarified with focusing the slide under the microscope.

Data analysis: Data will be analyzed by using Microsoft Excel, SPSS 20 software, Open EPI software. Appropriate statistical analysis was used wherever required. The values of p kept significant at the level below 0.05.

Ethical committee clearance: The approval by the Institutional Ethical Committee (IEC) of the Narayan Medical Hospital, Sasaram was taken.

Result
Present study consists of total 100 first year medical students participated. The mean age of study

participants were 20.63±1.581 yrs. (Range-18-25 yrs). Our study consists of 51% female and 49% male. 83% students from urban area where as only 17% study subjects were from rural area. In our study majority i.e. 33 (33%) of students belong to blood group type 'B' followed by blood group 'O' (27%), 'A' (21%) and 'AB' (19%). 98% study subjects did not had any chronic disease.
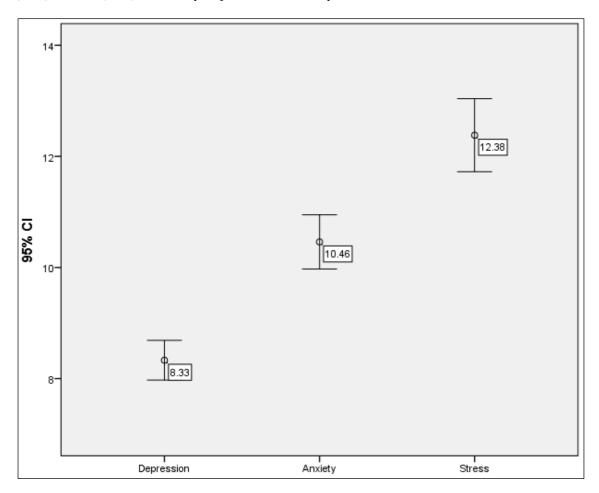

Fig 1: Depression, Anxiety and stress score of medical students

In our study we used DASS42 scale and mean Depression score were 8.33±1.804, mean anxiety score were 10.46±2.464 and Stress score were 12.38±3.314.

Table 1: Distribution of Depression, Anxiety and stress score as per Gender

Gender	No(%)	Depression score	Anxiety score	Stress score
Female	51(51)	8.31±1.881	10.76±2.303	12.73±3.470
Male	49(49)	8.35±1.739	10.14±2.606	12.02±3.139
Total	100(100)	8.33±1.804	10.46±2.464	12.38±3.314
Pvalue		P = 0.99, not significant	P= 0.21, not significant	P=0.28, not significant

In our study when we compare score on the basis of gender, it were 8.31±1.881,10.76±2.303, 12.73±3.470 for depression, Anxiety and Stress in female and 8.35±1.739, 10.14±2.606, 12.02±3.139 for female. After applying t test we found there is no significant association of gender and depression, Anxiety and stress score in our study subjects.

Table 2: Distribution of Depression, Anxiety and stress score as per blood group

Blood group	No (%)	Depression score	Anxiety score	Stress score
A	21(21)	7.86±0.964	9.43±2.378	11.71±2.348
B	33(33)	8.18±1.96	10.09±1.843	11.67±3.129
O	27(27)	9.70±1.706	12.22±2.276	15.30±1.938
AB	19(19)	7.16±1.119	9.74±2.621	10.21±3.457
Total	100(100)	8.33±1.804	10.46±2.464	12.38±3.314
	Anova test applied	F= 16.83, p <0.001, significant association	F = 8.36, P <0.001, significant association	F=15.02. p <0.001, significant association

Table 1 shows the depression, Anxiety and stress score as per the blood group. In study subjects of Blood group A, the depression, Anxiety and stress score were 7.86±0.964, 9.43±2.378 and 11.71±2.348. For blood group B, the depression, Anxiety and stress score were 8.18±1.96, 10.09±1.843 and 11.67±3.129, for blood group 'O' it were 9.70±1.706, 12.22±2.276 and 15.30±1.938 and for blood group AB it were 7.16±1.119, 9.74±2.621 and 10.21±3.457. When we study the association of blood group on depression, anxiety and stress score by applying ANOVA test we found very significant association between blood group to Depression, anxiety and stress score.
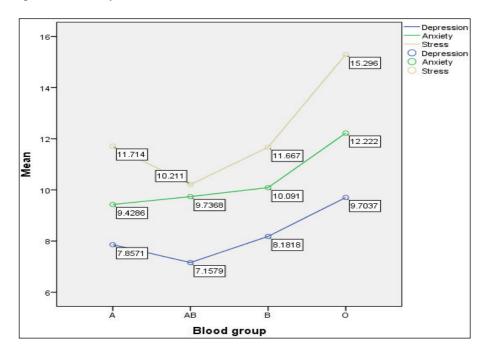

Fig 2: Distribution of Depression, Anxiety and Stress Score as per Blood Group

Discussion

It is hypothesised that various blood types have different ways to respond to stress management as the gene control blood types also control other things like dopamine metabolism, cortisol level and other processes that affect nervous system coordination. Variety of genetically determined antigens are present the surface of red cell membrane. The blood group A and B contain H antigen. The terminal sugar N-acetylgalactosamine is present on H antigen on blood group A, while in B group it is galactose. Blood group 'O' individuals have none of enzymes. The ABO system is arguably the most clinically important of the 29 established blood group systems. A single genetic locus on chromosome 9 controls ABO glycosyltransferase activity[8].

In our study we used DASS42 scale and mean Depression score were 8.33±1.804, mean anxiety score were 10.46±2.464 and Stress score were 12.38±3.314.Other studies such as by Balapala KR *et al*., [9] found that Severe depression was found in 9.7% students. Combined depression and anxiety was found in 42% of students belonging to health science courses. Nivetha MB *et al*., [10]found The prevalence of mild, moderate and severe stress was 20%, 74% and 6% respectively. Majority of the students (40.9%) considered academic related stressors to be the source of high stress.

In our study when we compare score on the basis of gender, it were 8.31±1.881,10.76±2.303, 12.73±3.470 for depression, Anxiety and Stress in female and 8.35±1.739, 10.14±2.606, 12.02±3.139 for female. After applying t test we found there is no significant association of gender and depression, Anxiety and stress score in our study subjects. Other study done on similar topic by Balapala KR *et al*., [9] found that Depression was found significantly among female students (38%) more than male students (18%). Heinen I *et al*., [11] found that No statistically significant differences in stress levels were found within the sample according to gender, migration background or employment status. Which is almost matches with the findings of our study. Deepak P *et al*., [12] shows there was no significant association of depression and anxiety with gender and academic year of study also almost similar to our study. Roy PP *et al*., [2] shows Anxiety scores were not significantly different in male and female students in both relaxed and stressed states.

In our study all depression, anxiety and stress is highest among blood group "O" and lowest among blood group AB then A and B blood group. This may be due to Cortisol is a stress hormone, Type O produce less, while Type A construct more cortisol. Overproduction of cortisol causes exhaustion and cause depression and fatigue. Type O reaction to stress can cause overproduction of adrenaline and make them more susceptible to stress and anxiety

Blood groups AB and B can excrete nitrogen oxide faster than other blood groups. Therefore a recovery

from stress situations is faster in these blood group study subjects. Other studies done on this topic such as Yadav K *et al*., [13]shows When comparing blood group and Depression score, a non-significant association (p=0.74) was observed. The association between blood group type O and depression was observed in normal patients by Sing S *et al*.,[14]Yadav A *et al*., [15]demonstrated that blood type might influence psychiatric symptoms. They showed that subjects with blood type A scored higher than those with type O on the obsessive-compulsive and psychoticism factors.

Conclusion

The results of our study indicate that subjects with blood group "O" perceived more depression, anxiety, and stress as compared to subjects of other blood groups and lowest among blood group AB then A and B blood group.

References

1. Shantibala K, Psychological Morbidity among Undergraduate Medical Students. Indian Journal of Public Health. 2015; 59(1):65-66.
2. Roy PP, Sailesh KS, Doshi MA. Depression, anxiety and stress among first year undergraduate medical students. Asian Journal of Biomedical and Pharmaceutical Sciences. 2015;5(45):37-38.
3. Sravani A, Doshi D, Kulkarni S, Reddy P, Reddy S. Depression, anxiety, and stress among undergraduate dental students in Hyderabad City, Telangana, India: A cross-sectional study. J Indian Assoc Public Health Dent. 2018;16:26-9.
4. Neumann JK, ShafFB, Harvill LM, Jones E. Personality traits and blood type in duodenal ulcer patients and healthy controls: Some Preliminary results. Medical Psychotherapy. An International Journal. 1992;5:83-8.
5. Chaudhuri A, Ray M, Hazra SK, Goswami A, Bera S. Correlation of perceived stress with blood group A and O among medical students and its effect on lipid profile in a medical college of Eastern India. Saudi J Sports Med. 2016;16:57-61.
6. Lovibond SH, Lovibond PF. Manual for the Depression anxiety Stress Scales.(2nd Ed) Sydney: Psychology Foundation, 1995.
7. Anandarajan B, Prathiba A, Dorairaj VS, Banu KK, Muthukumar S. Correlation of academic scores with blood group among first MBBS medical students. Int. J Biomed Adv. Res. 2015;6:328-30.
8. Yamamoto F, Clausen H, White T, Marken J, Hakomori S. Molecular genetic basis of the histo-blood group ABO system. Nature. 1990; 345:229-33.
9. Balapala KR, Indla D. Depression, Anxiety, and Stress among Health Science Students belonging to Non-affluent Families: A University-based Study. Int. J Sci. Stud. 2017;4(12):99-102.
10. Nivetha MB, Ahmed M, Prashantha B. Perceived stress and source of stress among undergraduate medical students of Government Medical College, Mysore. Int. J Community Med Public Health. 2018;5:3513-8.
11. Heinen *et al*., Perceived stress in first year medical students-associations with personal resources and emotional distress. BMC Medical Education. 2017; 17(4):1-12.
12. Deepak P, Usmani UUN, Washdev W, Mirza D, Naz F, Das K*et al*. Prevalence of depression and anxiety among undergraduate medical students in a government medical college of Karachi. J Postgrad Med Inst. 2017; 31(3):281-5.
13. Yadav K, Solanki J, Dileep CL. Association between Different Blood Groups, Depression and Oral Health Status of Dental Students. Clujul Medical, 2018. DOI: 10.15386/cjmed-830.
14. Singg S, Lewis JL. Depression and blood types. Psychol Rep. 2001;88(3):725-6.
15. Yadav A, Sankhla M, Gaur KL, Gupta ID. Association of psycho-wellness with various blood types in young medical students. Int. J Res Med Sci. 2016;4:3468-72