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EVALUATION OF ANXIETY STATUS IN MEDICAL STUDENTS PRIOR TO EXAMINATION STRESS

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Abstract : Pulse rate (PR), blood pressure (BP), auditory reaction time (ART), galvanic skin resistence (GSR), and eosinophil count (EC) were determined in 30 male and 25 female medical students appearing for the I MBBS viva-voce examination. Two readings were taken viz 2 months (control) and 20 min prior to the examination. A statistically significant increase was seen in the PR and BP while a significant decrease was observed in ART, GSR and EC before the examination as compared to the control readings. There was a significant correlation between the PR and ART.

Key words : viva-voce examination, galvanic skin resistence, heart rate, auditory reaction time, eosinophil count, blood pressure

INTRODUCTION

A number of bodily responses such as changes in the GSR, PR, skin temperature etc are associated with stress (1). Under stress or anxiety there is a decrease in the GSR which can serve as an important and simply determined physiological indicator of the tension state (2). Sensory stimulation as in conflicts, challenge, physical or mental effort, pressure for speed, all tend to raise such arousal level (3). PR also is a recognised index of anxiety states (4). The present study was undertaken to evaluate the anxiety status in medical students at the time of their viva-voce examination by measurements of PR, BP, ART, EC and GSR.

METHODS

30 male and 25 female students, in the age group of 18-20 yrs, appearing for the I MBBS viva-voce examination, were selected for this study. All of them were free from any physical disability and gave reporoducible responses. In them PR, BP, GSR, EC and ART were determined 2 months before the examination to act as control and them 20 mins prior to the examination. The estimations were carried out at 9 am (2 hrs after breakfast). ART was determined with the apparatus described by Malathi et al (5) and mean of 5 readings was calculated. Mean values for PR and BP were determined. EC was determined with acetone-eosin diluting fluid (6). GSR was measured with a constant 40 ump current circuit (7). Electrodes for this were placed in the centre of the palm of the hands at least 10 mins before measurements were begun. Mean of three measurements at 1 min interyals were taken to determine the response.

RESULTS

The PR showed a significant rise from the control value of 89.20 beats/min to 100.15 beats/min. Similarly a significant rise in the mean BP from 86.35 mm Hg to 95.62 mm Hg was observed. ART showed a significant fall from 192.02 msec to 170.48 msec. The EC decreseased from 303.66 cells/cu mm to 241.46 cells/cu. mm which was highly significant. GSR reduced to 44.40 kΩ from 89.45 kΩ. Further, a significant correlation was observed between the PR and ART ($r = 0.9$), with the ART being lowest (140 msec) at PR of 120 beats/min.

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TABLE I : Comparison of PR, BP, ART, EC and GSR 2 months & 20 mins prior to Viva-Voce Exam.

Parameters	*2 mths before exam (control)*	*20 mins before exam*
Pulse (beats/min) ± SD	89.20 ± 7.83	100.15 ± 21.90*
Mean BP (mm Hg) ± SD	86.35 ± 14.85	95.62 ± 6.72**
ART (msec) ± SD	192.02 ± 22.35	170.48 ± 23.51**
EC (cells/cu mm) + SD	303.66 ± 69.27	241.46 ± 57.99**
GSR (KΩ) ± SD	89.45 ± 26.19	44.40 ± 25.30**

*P<0.05; **P<0.001

DISCUSSION

The present study showed a significant increase in the PR and BP prior to the examination. This is in accordance with the results of Frecychuss et al, who attributed this to increased epinephrine secretion (8). The rise in PR and mean BP are important sympathoadrenal responses to physiological stressful experience. When the outcome, viz, examination result is unpredictable, or in conditions of fear, there is an increase in adrenaline secretion (9). The increased sympathoadrenal response is also associated with an increase in alertness (9), which could be contributing to the decrease in ART. The effect on ART, by reticular fecilitation, is primarily on the "Central integrative time" (9). PR is a recognised index of arousal states and the ART was shortest at the maximum PR of 120 beats/min with a correlation between ART and PR (r-09). This is in accordance with the earlier studies of Sjoberg (10), and Weller et al (12). The decrease in GSR just before the examination was also due to the anxiety status. Further, the decrease in EC response prior to the examination could also be accounted by the increased anxiety status as mental tension acts via the hypothalamo-hypophyseal system, resulting in increased secretion of corticotropin (1, 3), which results in decrease in EC count (13).

In conclusion, a rise in PR and mean BP, and fall in GSR, EC and ART, are observed in the anxiety state resulting in increased arousal due to examination stress.

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