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Research Paper

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Effect of Short Term Shavasan Practice on Eeg Pattern in Young Adults

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ABSTRACT

The present study was undertaken to find out the effect of short term Shavasan practice on EEG pattern in young medical students. A sample of 82 medical students, was drawn from the I MBBS batches and they were tested for Alpha index(AI) and Alpha appearance time(AAT) in the EEG pattern. 42 students of study group were trained to perform Shavasan, a relaxation technique, for half an hour everyday for a period of twelve weeks. The EEG was taken again after a period of 12 weeks and the scores were compared. There was an increase in Alpha index and reduction in Alpha appearance time after short practice of Shavasan and both were statistically significant. In 40 students who were chosen to make the control group, Alpha index and Alpha appearance time (AI and AAT) were measured in EEG before and after 12 weeks without any practice of Shavasan. The change in their EEG pattern was not significant statistically.

Introduction:

The present age is an age of anxiety and stress. With advancement of knowledge, the need to learn more and retain more in a limited life-span has gained importance. This limitation of time has given rise to more anxiety. Therefore the need to study anxiety and all factors associated with it.

"Anxiety is the individual's reaction to the invasion of his conscious mind by irrational forces and images from the collective unconscious which serve as a threat to the orderly, stable existence of the individual", said Jung(1956)[1] in his definition of anxiety.

Giving importance to the stimulus of drive and considering its energizing function in their theory, some psychologists conducted studies relating anxiety with academic performance. They found that high anxiety groups are clearly superior in academic performance to the low anxiety groups.[2,3]

In today's cut-throat competition this theory holds great relevance for those individuals who strive for success. Anxiety for them acts as a driving force to better their performance.

Viewing both schools of thought the logical conclusion one can draw is that anxiety within reasonable limits inspires and drives the individual to reach the heights of excellence but once it exceeds these limits its unpleasant influence acts as a deterrent to the progress.

Since Freud's conceptualization of anxiety in 1894,clinical studies on anxiety have been conducted with increasing regularity[4]. There are two distinct aspects to the measurement of anxiety. Psychological tests are used with statements based on symptoms experienced during anxious states. These measure self-estimated subjective anxiety scores.

Anxiety being such an intense emotion is accompanied by a rise in arousal level and stimulation of the autonomic nervous system. As a result there is change in physiological parameters. These changes indicate the person's reactivity to stressful conditions. Examples of such parameters are changes in blood pressure, cardiac output, forearm blood flow, pulse volume and rate, heart rate, respiratory rate, Galvanic skin resistance, palmar sweat index, Electroecephalography, papillary reactivity, cold pressor test, stomach acid output and salivary secretion.[5]

The correlation of EEG with personality traits has been observed by some psychologists and physiologists. It was reported that subjects with higher anxiety proneness ratings had less developed alpha and more fast activity in the resting EEG. Those who are less anxiety prone tend to have more abundant alpha activity in EEG.[6]

As a result of extensive studies and research work a lot of thought is now being given to find effective means for reducing the tension and discomfort arising from anxiety. Physiologists, psychologists and even the common man today is aware that stress cannot be avoided since it is a part of living in a race against time. The only solution to reduction of anxiety is relaxation techniques which reduce the reactions to stress by preventing anxiety from reaching abnormally high levels.

Ancient Indian literature has described various methods of meditation. Among them yoga and transcendental meditation are popular. Biofeedback relaxation techniques are successful too. Regardless of the technique, all relaxation methods have one common goal; reduction of the response of the autonomic nervous system to stressful situations. These techniques train the individual to reduce the anxiety arising from the stress and strain of modern living.[7-11]

Medical students form a group that is required to perform at high levels of mental competence. They are required to take tough tests to gain admission to the course and are then subject to the unrelenting task of learning innumerable facts and to recall them at a moment's notice. Hence they are ideal to study an objective measure of anxiety like Alpha wave pattern in EEG and find effective means to reduce anxiety by practicing relaxation techniques like Shavasan.

To record the EEG and to study the Alpha index and Alpha appearance time in EEG pattern. To find the effect of short term practice of Shavasan on the Alpha wave pattern in the EEG.

Materials and Methods

The present study was undertaken in the Department of Physiology, Government Medical College, Jabalpur from June 1995 to July 1996. A sample of 82 medical students, 42 males and 40 females, between the ages of 17 and 20 years was drawn from the I MBBS batches. EEG pattern was recorded in the students.

Electroencephalography(EEG):

An eight channel Medicare EEG machine was used to record the EEG of the subject using 10-20 system of scalp electrode placement. Sitting comfortably the initial recording with the subject's eyes closed was made for more than one minute after the rhythm was stabilized. Then he was asked to open his eyes and then close them suddenly till an alpha rhythm lasting for 5 seconds was observed in the occipital leads. The following parameters were examined in the EEG:

(a) **Alpha index (AI)** :The percentage of total time that was made up by the alpha rhythm pattern in occipital leads was calculated as the alpha index in one minute of record after stabilization of the rhythm.[12]

Calculation of Alpha Index (AI):
Total time of record for calculation of Alpha Index
= 60 seconds
1 second = 25mm

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Total distance of record = 60 x 25 = 1500
Let total of Alpha distance be = X mm
For total record distance of 1500mm, distance of Alpha waves = X mm
Percentage of Alpha = (X/1500) x 100

a) Alpha Appearance time (AAT)
This test was based on individual variability of reactivity of alpha rhythm to sensory stimulation, particularly visual. Reactivity to stimulation maybe measured as latent time before blocking (blocking time) or total duration of blocking phenomenon (time blocked). Blocking means replacement of Alpha rhythm by beta activity.

The second of these responses (blocked time) was used in this study and is named Alpha Appearance time (AAT). This blocked time or Alpha appearance time depends upon many factors like stimulus intensity, duration of stimulus and presentation of stimulus as solitary or a group of stimuli.[13-16] The effect of these factors was standardized by making the subject open his eyes and close them immediately, with standard illumination of the room in which EEG was recorded.

The time in milliseconds for Alpha type of wave pattern lasting 5 seconds to appear in the EEG after closure of the eyelids was the Alpha appearance time.

Calculation of Alpha appearance time:
Speed of movement of paper = 25 mm/second
Hence distance travelled during one second = 25mm
Distance from the mark for eye closure to the start of appearance of Alpha type of wave pattern was measured in mm.
Let distance be = X mm
For 25 mm distance, time = 1000 millisecond
1mm = 1000/25 = 40 ms
X mm = 40 x X ms

After the above test 42 subjects were trained to perform Shavasan regularly for half an hour daily for a period of 12 weeks. The technique of Shavasan is described as follows:

Technique of Shavasan :
The subject lies on the mat with arms and legs comfortably apart with eyes closed. Then he relaxes the different parts of the body by autosuggestion. He remains in a relaxed state with eyes closed for half an hour. During this half an hour the subject dedicates himself and all his actions to the higher power and practices meditation. At the end of half an hour he slowly starts moving his fingers and toes and then hands and feet and opens his eyes then turns to the left lateral position before getting up. This is Datey's technique of Shavasan.[17]

40 students of control group were not given any training for Shavasan. Their EEG patterns were recorded initially and then again after a period of 12 weeks. Alpha index and Alpha appearance time were calculated in them.

Results:
Table no : 1 showing EEG pattern after short term Shavasan practice in study group

Sr no	Observation	Mean	SD +/-	t Value	Sig
1.	Alpha index (%)	61.02 78.67	31.06	3.68	***
2.	Alpha appearance time (milliseconds)	1221.93 441.69	1162.2	5.04	***

***** Very Highly Sig**

Table showed that the Alpha index is increased and Alpha appearance time is reduced after short term Shavasan practice and the reduction is significant statistically.

Table no: 2 showing EEG pattern in control group

Sr no	Observation	Mean	SD +/-	t Value	Sig
1.	Alpha index (%)	60.87 61.02	23.12	0.0432	NS
2.	Alpha appearance time (milliseconds)	1286.11 1249.24	1044.2	0.0513	NS

NS : Not Significant

Table showed that the change in Alpha index and Alpha appearance time is not significant statistically in control group.

Discussion
Results (Table 1,2)showed Alpha index was increased and Alpha appearance time was reduced in EEG after short term practice of Shavasan in subjects of the study group, and the change was significant statistically. In subjects of the control group the change in EEG pattern after 12 weeks was not significant statistically. Hence objective anxiety measured by Alpha wave pattern in EEG was reduced after 12 weeks of Shavasan practice. These results are in agreement with other studies.

Bagchi and Wenger[7] demonstrated that well modulated Alpha rhythm was common in the highest state of one pointed absorptive meditation.

Anand et al[8] showed that Alpha rhythm was enhanced in yogis practicing meditation. Students of yoga who were successful had a well developed Alpha rhythm in their resting EEG.

Wallace [9] demonstrated an increase in amplitude and regularity of Alpha waves in students practicing transcendental meditation.

Jangid et al[11] showed an increase in EEG Alpha activity after 6 weeks of practice in transcendental meditation.

Singh et al[10] showed a significant rise in Alpha index after 3 months of Sahaj yoga training.Females showed a lower alpha index in EEG as compared to males and it is statistically significant. There is no study which shows a similar finding. The reduction in anxiety levels after short term practice of Shavasan is similar in males and females. Thus 12 weeks of Shavasan practice reduces anxiety measured by Alpha wave pattern in EEG .

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