Effect of Mentat (A Psychoactive Herbal Preparation) on Anoxia Tolerance in Albino Mice

Singh, V., Singh, A., Mishra, N. and Singh, N.,
Department of Pharmacology, K.G.’s Medical College, Lucknow, India.

ABSTRACT
Mentat, an Ayurvedic preparation containing central nervous system (CNS) active plant ingredients, was studied for its effects on anoxia tolerance in albino mice. Albino mice of equal weight groups and matched age were used in the study. Anoxia tolerance test was carried out by putting them in ½ litre capacity glass jars, which were hermetically sealed. First appearance of anoxic convulsions was taken as end point for each animal and the duration of anoxia observed in minutes. Administration of ‘Mentat’ in grade doses of 25, 50, 75 and 100 mg/kg per orally one hour before the test significantly increased the anoxia tolerance in each group. As anoxia of CNS cells plays a major role in the development of many brain disorders, it is possible that Mentat may be useful in these CNS diseases.

Keywords: Mentat – Psychotropic agent, Anoxia tolerance, Albino mice

INTRODUCTION
Mentat, a compound herbal Ayurvedic drug with CNS active ingredients, was studied for its effects on CNS anoxia in animals. Some preliminary reports (Sharma et al., 1991, Sheth et al., 1991) have shown this compound mixture to be an useful agent in some psychological disorders. Some of its plant ingredients viz. Centella asiatica (Brahmi), Withania somnifera (Ashwagandha) and Celastrus paniculata (Malkangni) have been reported earlier by several workers to improve memory and possess anti-stress and epileptic activity (Dey et al., 1964, Mukerjee and Dey, 1966, Singh et al., 1982, Singh et al., 1974). These medicinal plants are also well documented for their effects on human brain in the ancient Ayurvedic literature (Carak 2700 BC to 600 BC). In view of the above facts the effect of this herbal compound was evaluated in a suitable model for anoxia tolerance test.

MATERIALS AND METHODS
The powder of Mentat supplied by The Himalaya Drug Company was suspended in normal saline and was fed to the animals through the oral route by a trochar cannula. Graded doses of the compound were administered in different groups of animals. The anoxia tolerance test was done by the method of Tomar et al. (1984). Albino mice of equal weight and age groups were taken for the study. The mice weighed between 25 to 30 gms each. Hermetically sealed glass vessels of ½ litre capacity was used in this study. Each animal was placed in the vessel and the time was noted when the vessel was closed. The animal after some time developed anoxic convulsions. On the appearance of first anoxic convulsion the animals were removed from the vessel. The time of closing the vessel after putting the animal inside and the
appearance of first anoxic convulsion was “Anoxia Tolerance” time in mice. If any animal developed respiratory distress it was revived artificially by pressing the chest repeatedly. One week before treating the animals with different doses of the drugs each animal was subjected to anoxia tolerance test. This served as control anoxia tolerance time for each animal belonging to different groups. After one week of this test the drug was administered in doses of 25, 50, 75, 100 mg/kg in different groups of animals. After one hour of administration of drug per orally (p.o.) each animal was subjected to Anoxia tolerance test and the time was noted. The mean time of each group was calculated and compared with its own control. The data were statistically analyzed by using student ‘t’ test and significance of findings were observed.

RESULTS AND DISCUSSION
The results of the study are summarized in Table 1. Mentat in doses of 25, 50, 75, 100 mg/kg p.o. increased the anoxia tolerance time significantly in different groups of mice. The response was graded i.e. 7, 9 and 13 minutes for 25, 50 and 75 mg/kg doses respectively. However, dose of 100 mg/kg could not further increase the time of anoxia tolerance. It was same (13 minutes) as for the dose of 75 mg/kg although the response was significant.

<table>
<thead>
<tr>
<th>Group</th>
<th>No. of animals</th>
<th>Dose (mg/kg p.o.)</th>
<th>Mean anoxia tolerance in minute before drug treatment ± SE</th>
<th>Mean anoxia tolerance in minute after drug treatment ± SE</th>
<th>Mean increase in duration of anoxia tolerance (minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20</td>
<td>25</td>
<td>52.8 ± 5.1</td>
<td>59.8 ± 6.09</td>
<td>7*</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>50</td>
<td>60.4 ± 3.7</td>
<td>69.8 ± 4.9</td>
<td>9.4*</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>75</td>
<td>54.2 ± 2.4</td>
<td>67.2 ± 2.5</td>
<td>13**</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
<td>100</td>
<td>62.0 ± 2.8</td>
<td>75.0 ± 3.7</td>
<td>13**</td>
</tr>
</tbody>
</table>

*p value compared to control (same group) *<0.05, **<0.01.

The modern day lifestyle, with increasing competition for survival and increase in stress disease phenomenon, psychological disorders are increasing everyday and there is major lack of drugs for their treatment in modern therapy. Thus such an evaluation of herbal medicines for mental disorders is the need of the day. Anoxia of the CNS cells plays major role in the development of CNS disorders (Guyton, 1991). These disorders may result due to spasm / marteriosclerosis of CNS blood vessels either due to natural aging process or other causes like thrombosis, cerebral hemorrhage, cellular necrosis and biochemical damage to the cells. An agent like ‘Mentat’ which improves anoxia tolerance may allow cellular functions of CNS at low oxygen supply, thus appears to decrease O₂ demand during anoxia. The increase in anoxia tolerance time by ‘Mentat’ per se is a good indicator for its usefulness in various brain disorders.

REFERENCES


