

## **Changes in Brain Biogenic Amines under Influence of an Indigenous Drug, Geriforte, following Immobilization Stress**

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### **ABSTRACT**

*Immobilization stress causes marked elevation in different biogenic amines serotonin, melatonin and histamine in rat brain tissue. Oral administration of a herbomineral drug, Geriforte significantly reduced these elevated levels of biogenic amines indicating that the drug Geriforte has a significant antistress property.*

Several drugs have been introduced during the recent past for decreasing anxiety and stress in many emotional and physical disorders. Continuous oral administration of tranquillisers may cause cortical synchrony, relaxation of the skeletal muscles and drowsiness<sup>1,2</sup>. Recently, several herbomineral drugs have been clinically and experimentally studied for their antistress property. Many of them have shown encouraging results without any side effects.

Geriforte, is one of the known indigenous formulation (The Himalaya Drug Co.), induces cellular regeneration, increases hormonal utilisation and protein and carbohydrate metabolism<sup>3-5</sup>. This herbomineral drug have also shown antistress property<sup>6,7</sup>. The principal component of this drug is Chyavanprash concentrate. It also contains the extract of *Asparagus adscendens*, *Withania somnifera*, *Glycyrrhiza glabra*, *Centella asiatica* and *Mucuna pruriens*, etc. in different doses.

In the present study an attempt has been made to study the effect of Geriforte on brain biogenic amines level in experimental rats following immobilisation stress.

Albino rats (36) weighing 200 to 230 g were included in the present study and divided into 3 groups.

*Group I:* Normal series. 12 albino rats were kept under identical condition for 15 days and only vehicle (water) was provided to this group. At the end of 2 weeks all the 12 rats were sacrificed and their brains removed for the measurement of serotonin, melatonin and histamine.

*Group II:* In this group also there were 12 rats who were subjected to immobilisation stress continuously for 15 days (2 hr/day) and vehicle was also introduced to this group. The brains were removed after 15 days to measure the biogenic amines.

*Group III:* 12 rats were present here as well and they received immobilisation continuously for 15 days (2 hr/day). Simultaneously Geriforte powder was given orally in the dose of (100 mg/100 g) of body weight to all the rats. The brains were removed at the end of 2 weeks for the measurement of the biogenic amines.

Serotonin was measured by adapting the method developed by Snyder *et al.*<sup>8</sup>, while melatonin was measured as per the method followed by Ozaki *et al.*<sup>9</sup>

For measuring histamine, the fluorometric method was adapted as developed by Shore *et al.*<sup>10</sup>

Results presented in Table 1 clearly show elevated levels of serotonin, melatonin and histamine in the immobilization stress group in comparison to that in the normal series. Geriforte treatment significantly reduced these elevated levels of biogenic amines after 2 weeks of treatment.

<b>Table 1: Changes in brain biogenic amines of rats following oral administration of Geriforte after immobilization stress</b> (Values are mean $\pm$ SE from 12 animals in each group)				
Group		Serotonin (5-HT) $\mu\text{g/g}$ of tissue	Melatonin $\text{ng/g}$ of tissue	Histamine $\mu\text{g/g}$ of tissue
Group I	Normal rats	0.62 $\pm$ 0.13	12.03 $\pm$ 2.79	0.49 $\pm$ 0.05
Group II	Immobilization stress rats	2.25 $\pm$ 0.45	17.52 $\pm$ 1.77	2.00 $\pm$ 0.33
Group III	Immobilization + Geriforte treated RATS	1.67 $\pm$ 0.28	13.28 $\pm$ 1.57	1.45 $\pm$ 0.26
Comparison: Group I vs Group II ... $p < 0.001$ Group I vs Group III ... $p < 0.001$ Group II vs Group III ... $p < 0.001$ Group I vs Group II ... $p < 0.001$ Group I vs Group III ... $p < 0.05$ Group II vs Group III ... $p < 0.05$ Group I vs Group III ... $p < 0.001$ Group I vs Group III ... $p < 0.001$ Group II vs Group III ... $p < 0.001$				

In all stressful situations an increased activity of the sympathetic nervous system and release of biogenic amines have been recognised for many years. Hinshaw *et al.*<sup>11</sup>, have shown that circulating histamine was found increased in stress and stress disorders. Carrodi *et al.*<sup>12</sup> and Morgan<sup>13</sup> noticed increased levels of 5-HT in rat brain after immobilization stress. Drugs like reserpine influences biogenic amines to inhibit the uptake and storage of monoamines to inhibit the uptake and storage of monoamines by intraneuronal vesicles. The effect of psychotropic drugs on brain biogenic amines could not be directly assessed in the human brain. The concentration of different biogenic amines and their metabolites in human beings were studied indirectly from body fluids. But indirect measurement have marked limitation and therefore, conclusions could only be arrived at by direct measurement in the brain of animals.

Experimentally immobilisation stress produced marked elevation in the serotonin, melatonin and histamine content of the brain. But continuous oral administration of Geriforte brought about a marked decreasing trend in the level of above biogenic amines. The mode of action of Geriforte on the brain is not clear. In an earlier study total catecholamine in the blood was found reduced in different stress disorders<sup>14</sup>. Similarly, Geriforte prevents or ameliorates neurohumoral and enzymatic changes caused by anxiety and stress<sup>6</sup>.

More precise study is required to assess the mode of action and the possible role of Geriforte in the regulation of biogenic amines in stressful situation.

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