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## Dimethyl Glycine : A New Horizon in Therapeutics

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Dimethyl glycine (DMG) is a sweet-tasting substance which is readily available in many food stores of the United States. Anecdotal reports claim that children with infantile autism have been helped with DMG. Some studies have also shown that DMG improves the immune system.

**D**IMETHYL glycine (DMG) is a natural compound of the mammalian biochemistry and is found as a product of cellular metabolism from choline<sup>1</sup>. It is a dimethylated derivative of the simplest amino acid glycine. It is a naturally occurring metabolite found in both plants and animal species, being found in nature in meats, seeds and grains<sup>2</sup>. It is readily available in many food stores and is legally classified as a food in the US where it is available without a prescription. The taste is pleasant and children chew the tablets readily. It does not get stored in the body because of its rapid metabolism. It provides methyl groups which are essential for the formation of vitamins, hormones, enzymes, neurotransmitters and antibodies. It is a sweet-tasting substance that has been described as a natural, simple compound with no undesirable side effects<sup>3</sup>.

Although it resembles Vitamin B 15 (pangamic acid) in many ways, there are no known overt symptoms that are characteristic of DMG deficiency<sup>4</sup>. No adverse effects have been noted even with massive doses of the substance. It has been found to be an immunomodulator in experimental animals<sup>5</sup>.

### Dimethyl glycine and natural health :

Dimethyl glycine has been found to improve the physical and mental performance during periods of stress by maintaining homeostasis. It is an accessory food factor and an anti-stress nutrient which may be classified as a metabolic enhancer. It improves oxygen utilisation and results in decrease in lactic acid production. It increases

the maximum amount of exercise time before exhaustion sets in. It maximises the amount of energy production for each molecule of oxygen consumed. It also acts as an anti-oxidant, protecting the body cells from unwanted reactions caused by free radicals<sup>4</sup>.

### Dimethyl glycine and immunity:

DMG is known to increase the antibody production and cellular immunity. This results in a greater protection from bacterial and viral infections. The physiological mechanism by which DMG works is through the improvement of humoral and cellular immunity when administered orally at a dose of 1-3 mg/kg body weight<sup>6</sup>. It also stimulates lymphocyte proliferation<sup>7</sup> and interferon production<sup>4</sup>.

### Effects of dimethyl glycine on the cardiovascular system:

In a study done on over 400 geriatric patients affected by cardiovascular diseases, over 90% showed overall improvement in their individual circulation, with decrease in serum cholesterol levels, decreased incidence of anginal pain, decreased frequency of arrhythmias, decrease in blood pressure and improved stress tolerance<sup>6</sup>.

### Safety of dimethyl glycine:

A study on DMG reported by Meduski et al<sup>4</sup>, concluded that it is perfectly safe when used as a dietary supplement in conventional amounts. Even a dose of 1850 mg/kg had

no adverse effects on the blood pressure, breathing patterns, blood chemistry, oxygen intake or body weight. It has not shown any mutagenic or carcinogenic effects. On the contrary it is protective against mutagens and carcinogens. Autopsies done on experimental animals showed no apparent pathological changes.

#### **Dimethyl glycine and infantile autism:**

When DMG was administered to children with autism and mental retardation, beneficial effects of have been seen within a week, though it should be tried for a few weeks. In rare cases, dramatic results have been seen within a day<sup>5</sup>. Improvement of speech is the most notable positive change observed. Behavioural improvement has also been noted with less outbursts of behavioural abnormalities.

DMG was also observed to reduce the incidence of seizures in a mentally retarded adult<sup>8</sup>. In a study done on

39 autistic children at the Pusan Research Centre on Child Problems in Korea, 31 children showed improvement in speech, eating, co-operation and personal habits<sup>5</sup>.

In conclusion, if controlled, double-blind and randomised studies on dimethyl glycine are done, its efficacy and safety profiles can be determined. It is inexpensive and could be considered as a useful and affordable adjunct for therapeutic use in India.

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