Minerals, vitamins and amino acids are the core of our physical strength and fitness. Amino acids are the newest addition to the group and its deficiencies are now much more in the news. A group of 21 amino acids are termed as essential amino acids but apart from these there are some other amino acids which are equally essential or in some cases their requirement is even much more. Taurine is one such amino acid. It is a sulfur-containing small amino acid which is highly soluble in water. Chemically, it is amino ethane sulphonic acid and it is not toxic. It is found in our body, a normal adult human contains about 70 gm of Taurine. It is also present in sea weeds; marine arthropods and mollusks are, in general, high in Taurine; in fish, taurine is very common, pigeons contains a good amount of taurine; in almost every mammal, taurine must be met from dietary sources. The developing brain, in particular, has a high demand for taurine. Inability to satisfy this demand could lead to the development of abnormalities. The taurine demand of a newborn can be met by maternal milk. In human milk, taurine is the most abundant free amino acid (40 µmol/100 ml of milk) whereas cow’s milk-based formula on which the majority of the newborns are raised, contains no taurine.

Taurine is found in almost every tissue of the human body but more in excitable tissues, like the heart, brain and musculature. However, the highest levels are in the pineal gland and retina of the eye. In the past 20 years, extensive research on taurine has been carried out and it has been labeled as an essential amino acid, a preventive medicine, and a vitamin-like molecule. Next, the most important stage of taurine essentiality is the newborn; the rapid body growth is associated with a large increase in the total body taurine, which must be met from dietary sources. The developing brain, in particular, has a high demand for taurine. Inability to satisfy this demand could lead to the development of abnormalities. The taurine demand of a newborn can be met by maternal milk. In human milk, taurine is the most abundant free amino acid (40 µmol/100 ml of milk) whereas cow’s milk-based formula on which the majority of the newborns are raised, contains no taurine.

This has compelled many formula-based milk producing companies in the USA, Europe and other countries to have a new improved taurine-containing formula that performs closest to human milk. Humans are unable to synthesize more than minor quantities of taurine. Thereafter the demand must be met by an exogenous source. People who eat a non-vegetarian diet, receive considerable quantities in their diet, anything between 30-300 mg/day. Taurine deficiency is associated with epilepsy, acute hepatitis, retinal degenerative congestive heart failure, hypertension and many other conditions. Taurine deficiency can be corrected through taurine supplementation.

Some of the recent additions to its credits are its beneficial role in diabetes, cancer, smoking, alcoholism, bone growth and development. As in the past so at present every one hates aging and wishes to not look older if not younger. Taurine seems to be involved in alleviating aging through several agencies which include modulation of the calcium current, scavenging reactive oxygen species (ROS) and cell regulation. It is interesting to note that in an island of longevity, in Japan, taurine content is significantly higher in both men and women; taurine also has a restorative effect on the age-related decline of the T cells. Advance age-related problems are believed to be linked with the availability of glutathiones (GHS). Taurine and glutathione have the same precursor: cystein, thus taurine and glutathione are interlinked. Exercise also alleviates aging and taurine concentration is recorded elevated in exercise. Now taurine is part of several anti-aging formulas.

In spite of all this success, amino acid therapy has its own limitations viz. first pass effect, low permeability. This necessitates looking into the structural modification of taurine to provide prodrugs.

Sources