SUMMARY AND CONCLUSIONS

Now-a-days Oxidative stress is becoming an interesting subject for determining pathogenesis of many diseases. It is thought to be increased in a system where the rate of free radical production is increased and or antioxidant mechanisms are impaired. Overwhelming evidence has accumulated showing that antioxidants may prevent oxidative damage and thus protect against the adverse effects of oxidants.

In this point of view the aim of present project was to study role of oxidative stress & antioxidants in pathogenesis of encephalopathy in children & neonates along evaluation of antioxidant adjuvant therapy in management of encephalopathy in addition to usual management.

Vitamin E exerts its antioxidant property by preventing chain propagation. Vitamin C acts as water soluble antioxidant by inhibiting initiation of lipid peroxidation and also required for regeneration of vitamin E. The net result is required in lipid peroxidation resulting in reduced serum MDA levels. The
antioxidants are acting synergistically e.g. vitamin C is required for regeneration of vitamin E while trace element zinc is required for regeneration of vitamin E. Also trace elements are required for activation of antioxidant enzymes.

The results of present study indicated that in baseline study, the serum oxidants i.e. MDA & NO were significantly increased in all encephalopathy patients than control subjects. At the same time antioxidants i.e. superoxide dismutase & catalase activities were observed to be decreased significantly in encephalopathy patients as compared to control subjects. Thus in base line study, simultaneously increased oxidant levels were accompanied by decreased antioxidant levels.

Catalase is antioxidant enzyme protecting cells from Hydrogen peroxide. In encephalopathy due to oxidative stress catalase enzyme could be inhibited by increased concentration of the superoxide anion radical and Malondialdehyde. Inhibition of catalase might lead to less degradation and increased concentration of Hydrogen peroxide.
Summary & Conclusions

Superoxide dismutase is an important shield of the body against superoxide radical. SOD enzyme might be inhibited by increased concentration of Hydrogen peroxide.

Thus inhibition of catalase & SOD could be indicated by its decreased activity in encephalopathy. The inhibition of these antioxidant enzymes might contribute to further augmentation of oxidative stress.

Similarly baseline levels of serum antioxidant vitamins i.e. vitamin E & vitamin C were observed to be decreased significantly in encephalopathy patients than controls. These antioxidant vitamins could be over exhausted to fight back oxidative stress in condition of lowered activities of enzymatic antioxidants i.e. SOD & catalase, whose activity was also significantly decreased in encephalopathy patients.

In this study transition element micronutrient zinc was found to be decreased significantly in encephalopathy patients as compared to control subjects. The decreased concentration of zinc is associated with reduced SOD levels.
Summary & Conclusions

We have found significantly decreased total antioxidant status in the serum of all the encephalopathy patients as compared to the control levels. Decreased total antioxidant status could be the result of overall decreased antioxidative defense system in the encephalopathy patients.

In our study we have given Antioxidant Adjuvant therapy along with routine management of encephalopathy. Levels of oxidants & antioxidants were determined in both groups at the end of study. We have found significant decrease in levels of MDA & nitric oxide along with significant increase in levels of antioxidants in patients of encephalopathy receiving antioxidant adjuvant therapy in addition to routine management.

As the increased concentration of oxidant & decreased concentration of antioxidant are indicators of oxidative stress we conclude that along with various factors, oxidative stress may be one of the most important factors behind the pathogenesis of encephalopathy in children & neonates.

The treatment using the Antioxidant Adjuvant Therapy along with routine management significantly decreased oxidants and
significantly increased the antioxidants in encephalopathy patients as compared to encephalopathy patients receiving routine management.

At the end of the study we have reached to the following conclusions:

1) **Oxidants & antioxidant parameters can be used for determination of prognosis of the encephalopathy in children & neonates.**

2) **Antioxidant Adjuvant Therapy is potentially useful in management of encephalopathy in children & neonates.**

However further studies are required to confirm our results.