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## Comparative Study of the Efficacy of Ascorbic Acid, Quercetin, and Thiamine for Reversing Biomarkers of Ethanol-Induced Toxicity

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This study compares the curative effect of three antioxidants—ascorbic acid, quercetin, and thiamine—on ethanol-induced toxicity in rats. Administration of ethanol at a dose of 4g/kg of body weight/day for 90 days initiated chronic alcohol-induced oxidative stress as shown by increased malondialdehyde level and DNA fragmentation in liver and brain. Ethanol administration also led to a decrease in DNA content. Activities of toxicity marker enzymes—alanine aminotransferase, aspartate aminotransferase, and  $\gamma$ -glutamyltranspeptidase—in liver and serum increased progressively upon ethanol administration. After ethanol administration for 90 days, the efficacy of antioxidant treatment of the alcohol-induced toxicity was studied by supplementing ascorbic acid (200 mg/100g of body weight/day), quercetin (50 mg/kg of body weight/day), and thiamine (25 mg/kg of body weight/day) for 30 days. These groups were compared with the abstention group (not treated with ethanol). All the alterations induced by alcohol were reduced significantly by the supplementation of antioxidants and also with abstention. The regression by antioxidants was greater that of abstention. Antioxidants significantly reduced the oxidative stress induced by ethanol intoxication, increased membrane integrity, and also increased organ regeneration. Ascorbic acid was shown to be more effective than quercetin and thiamine in treating both hepatotoxicity and neurotoxicity induced by alcohol administration. This may be due to the higher antioxidant potential of ascorbic acid in physiological conditions.

## Publications

- 1. Protective effect of quercetin in the regression of ethanol induced toxicity. A.Vidhya and M.Indira. Indian Journal of Pharmaceutical Sciences. 2009.71(5). 527-532.
- 2. Comparative study on the effect of three antioxidants in the regression of ethanol induced toxicity. Ambadath Vidhya, Venu RG and Madambath I. Journal of Medicinal foods 2010 Dec; 13(6):1485-9.
- 3. Impact of Thiamine Supplementation in the Reversal of ethanol induced toxicity in rats. Vidhya A., Renjugopal V. and Indira M.\*Indian Journal of Physiol and Pharmacol. 2013; 57(4): 406–417.
- 4. Research abstract on Ascorbic acid role in the regression of ethanol induced hepatotoxicity in the proceedings of thirtyninth national conference of nutritional society of India held at National institute of nutrition, Hyderabad November 15-16, 2007.

## **Biography**

Vidhya Sunil has expertise in toxicity marker studies. Her main areas of studies were hepato and neuro toxicity. Future studies include molecular mechanism behind the toxicity.

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