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Effects of *Camellia sinensis* in alcohol abstinence anxiety, depression and gene expression analysis in hippocampus of rats

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Statement of the Problem: Alcoholism is a serious public health problem that often results in medical, social (violent crimes and traffic accidents) and economic consequences throughout the world. There has been increasing thrust worldwide to opt for safer and effective plant-derived anti-addiction drugs mentioned in the traditional medical systems. Green tea (*Camellia sinensis*, family *Theaceae*) have huge medicinal uses and traditionally used for the treatment of alcohol disorders. Therefore, we evaluated the effect of *Camellia sinensis* in alcohol abstinence syndrome, developed following long-term voluntary alcohol intake in rats.

Methodology & Theoretical Orientation: The hydro-alcoholic extract of *Camellia sinensis* leaves (HECS) was first characterized for the presence of epigallocatechin gallate (15.73% w/w), and subsequently acute, sub-acute toxicity studies were also performed. For evaluation of the effects of HECS in ethanol abstinence syndrome, healthy Wistar rats were enabled to voluntary drinking of 9% v/v alcohol for 15 days. The behavior studies were conducted employing tail suspension test, forced swim test, light-dark model and elevated-plus maze test on day 16th, 17th and 18th and peak ethanol withdrawal syndrome were determined. HECS (50, 100 and 200 mg/kg) and standard drug diazepam were administered orally during withdrawal symptoms. Oxidative stress parameters, serum serotonin, expression of *GABRA1, GABRA2, GABRA3, GABRA4, GABRA5* genes for $GABA_A$ receptor and *GRIN1, GRIN2A, GRIN2B* genes for NMDA-glutamate receptor in hippocampus of rats were also determined.

Findings: The results revealed that no observed adverse effect level was higher than 2000 mg/kg, orally. HECS exhibited significant protective effect at doses 100 and 200 mg/kg, but 50 mg/kg showed insignificant protection against alcohol abstinence syndrome like anxiety and depression. The increased expression of *GRIN2A, GRIN2B* and decreased expression of *GABRA1, GABRA2, GABRA4* following ethanol abstinence were also reversed by HECS at doses 100 and 200 mg/kg.

Conclusion & Significance: Thus, HECS has remarkable protective effects in ethanol abstinence syndrome, which may be due to its antioxidant, serotonergic, GABAmimetic or anti-glutaminergic effect.

Biography

Girdhari Lal Gupta has received his MPharm degree in Pharmacology and PhD in Pharmaceutical Sciences in year 2005 and 2009, respectively. He is currently working as an Associate Professor, Department of Pharmacology at SPP School of Pharmacy and Technology Management, SVKM's NMIMS University, Mumbai, India. He has published several scientific papers in peer-reviewed journals and presented his research work in conferences of national and international repute. He has also received Young Scientists Award, Travel grants, best oral presentation award, Government funded research projects from Science Engineering and Research Board, Indian Council of Medical Research. He is a Life Member of several professional bodies including Indian Pharmaceutical Association, Society for Ethnopharmacology, Indian Pharmacological Society, Association of Pharmaceutical Teachers of India and Indian Pharmacy Graduates' Association. He has also been nominated as CPCSEA Member by Animal Welfare Division, Ministry of Environment, Forests and Climate Change, Government of India.

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