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It has been reported that 85-95% of alcoholics are confirmed smokers. Despite the knowledge of negative consequences of alcohol consumption and smoking people often use both. The strong association between alcohol consumption and cigarette smoking is attributable to multiple factors among which pharmacological and biochemical actions of alcohol and nicotine are important. Studies on humans and animals showed that alcohol and nicotine (a chief constituent of tobacco smoke) potentiate each other's rewarding and reinforcing properties. The underlying precise and potential mechanism(s) of alcohol-cigarette smoke interactions are partially understood. Given the high rates of co-use and comorbidity, continued research into mechanisms underlying these events is most warranted. Hence the present study is designed to evaluate the biochemical events and mechanisms associated with plasma, red cell, platelet and membranes of red cell and platelets of alcoholic smokers and to compare them with alcoholics as well as teetotalers.

- Results of the present study showed an increase in the activity of GGT, blood alcohol levels and high concentrations of phosphatidylethanol in blood of alcoholics and alcoholic smokers. Furthermore, the data suggested alcohol lowering effect of cigarette smoke. The study showed decreased platelet serotonin concentration with a decrease in the activity of platelet MAO in alcoholics suggesting the effect of alcohol and cigarette smoking. The decrease in the activity of MAO is more prominent in alcoholic smokers.

- Results revealed a worse serum lipid profile and also lipoprotein patterns indicating more cardiovascular risk and the exacerbative effect of smoking in individuals consuming alcohol.

- The study also indicated an increased oxidative stress (evidenced from increased LPO) and decreased antioxidant status (evidenced from antioxidant machinery) in alcoholic smokers.
Nitrite and nitrate from plasma and cells (erythrocyte, platelets) are the known indicators of NO production. Elevated levels of nitrite and nitrate in alcoholics and alcoholic smokers along with other abnormalities in biochemical profile are evident from this study. Hence this study indicated that the intake of alcohol and nicotine (either alone or in combination) clearly has pathophysiological effects on organ function, and the progression of alcohol/tobacco related diseases seem to be directly influenced by NO mediated mechanisms.

Steady state fluorescence anisotropy studies using DPH and pyrene suggested decreased membrane fluidity in erythrocyte and platelet membranes. Differences in interactions with free radicals, oxidative damage products, antioxidant status and the involvement of nitric oxide and nitrosative stress may play a role in the observed effect. Furthermore, changes in erythrocyte membrane proteins in alcoholic smokers and alcoholics, especially in band 2.5, 3 and G-3-PDH are evident from the study.

Distribution analysis of phospholipids in erythrocyte and platelets revealed no impact of smoking on alcohol-induced alterations in the concentrations in individual phospholipid classes of these membranes. The impact of smoking on fatty acid composition of erythrocyte membrane of phospholipids of alcoholics and alcoholic smokers are pertinent. Changes in the activities of membrane bound enzymes such as $\text{Na}^+ \text{K}^+$ ATPase, $\text{Ca}^{2+}$ ATPase, $\text{Mg}^{2+}$ ATPase and acetylcholine esterase are more prominent in alcoholic smokers.

Furthermore, the study revealed that alcohol use and the combined use of alcohol and cigarette smoke affect the endocrine function and circulatory plasma hormone levels.