INTRODUCTION
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WHO ranks smoking and alcohol consumption as the first and third leading causes of global burden of diseases in developed and developing countries respectively.\textsuperscript{10} There has been a strong association between cigarette smoking and alcohol consumption. Both the smoking and consuming alcohol are related to increased mortality risk.\textsuperscript{4} The mortality rate associated with cigarette smoking has been reported to substantially greater than alcohol induced diseases.\textsuperscript{4} In reality many people are both drink and smoke. Combined exposure to both cigarette smoke and alcohol results in major health consequences including additive risks for several diseases such as cancers, cardiovascular and pulmonary diseases.\textsuperscript{5} Inspite of established global prevalence of synergism between alcohol consumption and cigarette smoking as well as their link with pathogenesis of several diseases,\textsuperscript{1} limited literature is available on the events associated with alcoholic smokers and the biochemical changes induced by the smoking comorbidity in chronic alcohol users.\textsuperscript{10} Understanding the precise molecular interactions between cigarette smoking and alcohol and associated biochemical events facilitate to address the problems related to alcoholic smokers and also to forward therapeutic strategies to ameliorate the damage and risk.

Both the Cigarette smoking and alcohol use are associated with substantial personal and societal harms.\textsuperscript{2} Increasing incidences of chronic diseases and tumors in alcoholic cigarette smokers may be the result of interactions between the two risk factors.\textsuperscript{3} Adverse health effects due to cigarette smoking and excessive alcohol use
are separately well documented in literature. Cigarette smoking is a leading
preventable cause of death in the world today killing around 6 million people by
using tobacco in a year – an average of one person every five seconds. The total
number of deaths caused by tobacco consumption/ cigarette smoking is higher than
combined death toll of tuberculosis, HIV/AIDS and malaria together. Smoking is
the major risk factor for several lung diseases such as COPD (Chronic Obstructive
Pulmonary Disease), ARDS (Acute Respiratory Distress syndrome), asthma and
cardiovascular such as CAD (Coronary Artery Disease), ischemic heart disease,
emphysema and several neoplastic and neurodegenerative disorders. Due to
various reasons, people are unable to quit smoking. It is well known that 80% of
alcoholics are confirmed smokers.

Alcohol is the most extensively used psychoactive relaxant worldwide for
recreation and other purposes. Though moderate intake was reported to be
beneficial due to its protective effects (Coronary protection and therapeutic action
against several diseases), excessive alcohol consumption leads to nearly 146 several
diseases such as CVD (cardio vascular disease), cirrhosis of liver, ALD (Alcohol
liver disease), various cancers and neuropsychiatric disorders. Despite the fact that
alcohol is responsible for a broad spectrum of diseases nearly 40% of global
population accounting to 2.5 to 3 billion people consume alcohol and more than
76.3 million people die from alcohol related disease. Numerous studies were
separately carried on the effects of alcohol and cigarette smoking but limited
information is available on the combined use of both cigarettes and alcohol, as in the case of cigarette smokers consuming alcohol. 7

Evidences suggested that both ( alcohol and smoking ) can increase perceptions of attractiveness across all stimulus types leading to a mechanism by which administration of one drug reinforces use of the other, and which leads to an increased likelihood of habitual consumption and relapse. 2 Nicotine may counteract the adverse effects of alcohol on cognition and motor incoordination and paired use of nicotine and alcohol produce a classical conditioned cue and reactivity leading to cravings for both substances. A genetic susceptibility has also been implicated in indulgence of current cigarette smoking and alcoholism. The alcohol may play a role in the biology of airway mucus, bronchial blood flow, air way sinus, the muscle regulation and interaction with other airway exposure agents such as cigarette smoke represents opportunities for future investigations. Furthermore, several researchers emphasized a need for additional studies to improve understanding of the best combination and timing of existing therapies to reduce the burden of diseases and damage by the joint exposure of smoking and alcohol. 10

Moreover, the cellular mechanisms influenced by combined alcohol and cigarette smoke exposure are poorly understood and more studies on interactions of cigarette smoking and alcohol related to our body and tissues are also most warranted. 5

Hence, the present study is designed to investigate chiefly the biochemical changes induced in cigarette smokers consuming alcohol to get an insight into the
mechanism(s) related to the molecular interactions between cigarette smoking - alcohol consumption and our body and tissues.

Considerable literature attests the adverse effects of alcohol and cigarette smoking. Enhanced oxidative stress, decreased antioxidant status and impaired nitric oxide metabolism have been implicated in the damage, diseases or pathologies associated with both the cigarette smoking and alcohol abuse respectively. Vast literature is available separately on cigarette smoking and alcohol abuse related to biochemical events. Limited studies are available on the combined use/joint exposure of cigarettes and alcohol. On the other hand, the interest of the researchers has been shifted recently from toxicity to therapy. Now the globe is turned towards plant medicine with less or no side effects. Therefore, an attempt also has been made in this study to find out the possible therapeutic effects of certain selected phytoextracts that ameliorate the damage caused by the combined use of cigarettes and the alcohol. The therapeutic effects in terms of free radical scavenging and nitric oxide scavenging effects of the selected traditional phytoextracts of *Phyllanthus emblica* and *Pterocarpus santalinus* were investigated and tested for their effect on alcohol induced erythrocyte hemolysis.  

Biomembranes play an important role in signal transduction in alcoholics and smokers. Recent studies revealed that nitric oxide is responsible for various physiological and biochemical events. Nitric oxide is also a constituent in cigarette smoke and excessive nitric oxide production was reported in alcoholics leading to
alcoholic damage. In view of all the above present study is designed to investigate the effect of cigarette smoking in alcohol consuming subjects and is chiefly aimed at the following objectives, in particular,

1) to investigate the changes in blood biochemical profile especially lipids, lipoprotein patterns and blood glucose homeostasis,
2) to study the changes in plasma and red blood cell membrane lipid peroxidation and nitric oxide production,
3) to understand the effects on red blood cell membrane proteins and carbonyl content,
4) to study the phytochemical composition of selected phytoextracts and their therapeutic potential,
5) to find out the effect of cigarette smoking on ethanol induced hemolysis of red blood cells from smokers, alcoholics and alcoholic smokers and to investigate the effect of phytoextracts on ethanol induced hemolysis,
References


References