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Aim and Scope

Whatever may be the reason, cigarette smoking is more prevalent in India, other developed and developing nations causing mortality, morbidity\(^1\). There have been an increased number of smokers for the past ten year with the entry of new smokers of all ages every year including teenaged boys and girls\(^2\). Besides passive smoking also has become a threatening for public\(^3\). Though the transient stimulatory, cognitive and reinforcing effects that prompt for addictive use of cigarette smoking with certain benefits, cigarette smoking has been recognized as a major risk factor for various cardiovascular, ocular as well as pulmonary diseases and cancers\(^4\text{-}^7\). Accumulated literature strongly attests the adverse effects of cigarette smoking much than the beneficial effects\(^8\). Limited information is available on biochemical events related to various effects of cigarette smoking and precise mechanism(s) by which smoking contributes to the development and clinical manifestations of these diseases as well as other effects are unknown\(^9\). It has been hypothesized and was also confirmed that the adverse effects of smoking may result from an accumulation of oxidative damage brought about by a large number of ROS (Reactive Oxygen Species) and superoxides and other constituents present in cigarette smoke\(^10\). As humans are oronasal inhalers, the inhaled smoke passes through parts of respiratory as well as digestive tracts to enter circulation affecting plasma, blood cells and tissues causing oxidative damage\(^11,12\). While passing through various parts, constituents of cigarette smoke interact with a variety of plasma antioxidants that prevent cigarette smoke-induced oxidative damage to some extent, and, other defense mechanisms also counteract the adverse effects of cigarette smoking, and thereby rendering partial protection\(^13\).
A characteristic response to cigarette smoking is impaired endothelium dependent vasodilation\textsuperscript{14}. It has been demonstrated that NO plays an important role in endothelial vasodilation and certain physiological, pathological and signal transduction processes, in general, chiefly regulating vascular tone, local blood flow, and tissue perfusion\textsuperscript{14}. A reduced EDV seems to be one of the earliest pathophysiological effects of various risk factors for atherosclerosis preceding morphological changes in the vessel wall in smokers\textsuperscript{15}. However the precise mechanism(s) of cigarette smoke-mediated changes, chiefly smoke-mediated endothelial dysfunction and alteration of NO, and some other physiological events related to NO are not clear, and existing data are often contradictory\textsuperscript{9,10}. Changes in plasma and blood would give valuable information concerning cigarette smoke mediated biochemical interactions and events\textsuperscript{9}. In earlier studies, effects of nicotine, a constituent among several components, were interpreted as effects of cigarette smoke\textsuperscript{16}. Now it is clear that effects of nicotine are not equivalent to whole cigarette smoke or cigarette smoking\textsuperscript{17}. For example, nicotine is not a known inhibitor of MAO; whereas whole smoke is inhibitory\textsuperscript{18}. The protective effects of natural antioxidants in human extra cellular fluids, and tissues, antioxidant defense reaction in vivo when directly exposed to cigarette smoke are important while considering the net effects of cigarette smoking\textsuperscript{19}.

In addition, membranes which are chief target sites of action for various psychoactive stimulants were also ignored in earlier studies\textsuperscript{20}.

Hence the present study has been designed with a view to understand the biochemical changes as well as the role of nitric oxide and molecular interactions in plasma, and red cell membrane.
Hence the objectives of the present study include:

- to examine plasma lipids and lipoprotein patterns in chronic smokers, as cigarette smoking is chiefly associated with cardiovascular disease and atherosclerosis.
- to understand the status of nitric oxide production and its mediation in cigarette smoke-associated effects in human chronic smokers.
- in order to determine the effects of cigarette smoking on biomembranes the other objective includes, to investigate the changes in the chief constituents of red cell membrane as well as their properties.
- to understand the effects of cigarette smoke on functional integration, osmotic fragility of red cells was studied.


