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**Short Communication**

# Tobacco Smoking: A Preventable Risk Factor of Various Eye Diseases

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**Abstract:** It is well known that tobacco smoking is associated with many systemic diseases like cardiovascular, pulmonary diseases. But awareness about association of tobacco smoking with various eye diseases is very less, not only in general public but also in well educated society. This article is just to create awareness in a community that by quitting the habit of tobacco smoking, it might be possible to decrease not only the load of systemic diseases but also the eye diseases in a community. It is an attempt to make young doctors, primary eye care providers, optometrists and ophthalmologist aware of the fact that tobacco smoking is one of the preventable risk factor of various eye diseases so that they can educate the patients to quit this harmful habit of smoking which not only affects them but also the innocent bystanders.
**Keywords:** Tobacco smoking, Health education, Eye diseases

## INTRODUCTION

Tobacco smoking is one of the major preventable risk factor for various cardiovascular and pulmonary diseases. It is also associated with several eye disorders but Public awareness about the risk of eye diseases associated with smoking is very low. Cigarette smoking not only affects the eyes of smokers but also the nonsmokers through passive smoking and through transmission from mother to baby via the placenta. Tobacco smoke contains more than 4,000 toxic substances like formaldehyde, carbon monoxide, hydrogen cyanide, nicotine, tars etc .The ocular disorders significantly linked to cigarette smoking are cataract, age-related macular degeneration (ARMD), retinal ischemia, anterior ischemic optic neuropathy (AION), Graves ophthalmopathy, tobacco-alcohol amblyopia etc.

## DISCUSSION

Various case controlled [1], cross-sectional [2] and prospective studies [3] done earlier confirmed the relationship between smoking and cataracts. The Framingham Study has shown that there is higher risk of developing nuclear opacity in people who smoke 20 or more cigarettes per day at the time of their first visit to ophthalmologist than non-smokers [4]. In the Beaver Dam Eye Study, the estimated increased risk of nuclear cataract to smokers was approximately 9% and the increased risk of posterior sub capsular cataract was approximately 5% [5]. The Physician's Health Study showed that the risk of any type of cataract decreases after stopping smoking and limiting the exposure seemed to limit risk [6].

Patients with wet type of age related macular degeneration are more likely smokers than non-smokers. There is an increased risk for ARMD in smokers, smoking without a filter, started smoking at an age younger than 20 years, and if smoked for more than 40 years [7].

A prospective study in the US has reported that the risk of ARMD is dose-dependent; more than 20 cigarettes a day had a two- to three-fold increased risk of ARMD with visual loss [8]. Khan *et al.* also demonstrated a strong association between the risk of both dry and wet ARMD and pack years of cigarette smoking. They not only reported an increased risk for ARMD in smokers but also in nonsmokers exposed to passive smoking [9]. One European study shows that the population attributable risk associated with smoking is approximately 33% for dry and approximately 25% for wet ARMD [10].

An association between smoking and Graves's disease was first described by Hagg and Asplundh [11].

Chung *et al*., identified cigarette smoking as an important risk factor in the development of non-arteritic AION [12]. Smoking is also a risk factor for retinal artery occlusion as Tobacco smoke accelerates the rate of atherosclerosis[13].

Tobacco smoke also causes eye irritation. The conjunctiva is highly sensitive to irritative gases that are present in tobacco smoke in active and passive smoking [14].

Smoking also has a deteriorative effect on the treatment of thyroid eye disease [15].

Astigmatism is 1.46 times more likely to occur in children whose mothers smoked during pregnancy than in children whose mothers did not smoke [16]. Children born to women who smoke during pregnancy are also prone to develop squint [17]. An increased risk of current smoking on primary open-angle glaucoma was suggested by Bonovas and associates [18]. Uveitis is 2.2 times more common in smokers than nonsmokers [19]. Current smoking is also associated with symptoms of dry eye.

**How tobacco influences the eye?**

Tobacco influences the eye either by producing ischemia or oxidative stress. Nicotine present in tobacco causes vasoconstriction and it is well known that the process of atherosclerosis increases and carbonmono-oxide decreases the oxygen carrying capacity of blood in smokers; these all factors are responsible for ocular ischemia leading to anterior ischemic optic neuropathy and retinal ischemia. Smoking increases the risk of age-related macular degeneration by reducing antioxidants concentration in plasma and by increasing oxidative stress and lipid peroxidation. A study by Marianne and Maria evaluated that Nicotine increases the VEGF/PEDF Ratio (proangiogenic vascular endothelial growth factor (VEGF) and antiangiogenic pigment epithelium derived factor (PEDF) in Retinal Pigment Epithelium through nAchR(nicotinic acetylcholine receptors ) which is a possible mechanism for chronic neovascularisation in passive smokers with ARMD. Nicotine is abundant in second-hand smoke so play a major role in the pathogenesis of wet AMD. [20]. Oxidative damage is also responsible for cataractogenesis. Compounds in cigarette smoke stimulate inflammation within the blood vessels which contribute to disruption of immune system and uveitis [19]. In smokers there is an increase in thyroglobulin protein which possibly increases thyroid autoantibodies and therefore thyrotoxicosis. Smoking-induced hypoxia increases cytokine release and the inflammation of thyroid eye disease [21].

**CONCLUSION**

Tobacco smoking is not only the major preventable risk factor of many systemic diseases but also a leading preventable cause of many eye diseases. This suggests that by eliminating smoking, it might be possible to decrease the load of eye diseases in a community .We should teach our patients to quit smoking, and make them aware of the eye diseases which occur or their incidence or severity increases because of tobacco smoking. As primary eye care providers, optometrists and ophthalmologist we all should educate our patients to quit this harmful habit of smoking which not only affects them but also the innocent bystanders. We should impose the policy of non smoking in public places. So in the battle against smoking ophthalmologist should join hands with general physicians. Strict enforcement of control measures would effectively contribute to decrease in the incidence of smoking related ocular and general diseases.

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