

Effect of Chronic Cigarette Smoking On Cataract:

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Abstract:

Objective: The purpose of this study was to examine the effects of chronic smoking on various types of cataracts in healthy male smokers. Tobacco use as the single most important preventable risk factor to human health in developed countries and an important cause of cataract. Out of 4000 chemical in cigarette, 100 are toxic. smoke contains harmful free radicals that potentially damaging lens proteins and the fiber cell membrane in the lens. smoking reduces the body's levels of antioxidants and certain enzymes which may help to remove damaged proteins from the lens.

Methods: 53 smokers and 53 nonsmokers were selected from the OPD of ophthalmology department of konaseema institute of medical sciences and research foundation (KIMS & RF) ,Amalapuram, EG district, AP,india with age of 40-60 yrs as subjects. Smoking group smokes for a period 12 to 40 yrs. **Results:** the smokers registered an increase Incidences of Immature Cataract is more among the smokers 60.38 % (No.32) than the nonsmokers 52.83 % (No.28). Incidences of mature Cataract is more among the smokers 28.30 % (No.15)than the nonsmokers 22.64 % (No.12). Incidences of Nuclear Cataract is more among the smokers 11.32 % (No.6)than the nonsmokers 09.43 % (5). Incidences of Cataract among the smokers is highest in the tobacco roll smokers 84.91 % (No.45),high in the cigarette smokers 13.21 % (No.7), 13.21 % (No.7), very low among the beedi smokers 01.88 % (1).

Conclusion: In our study, on 53 smokers, we found the significant increase in number all types of cataract.

Key Words: Cataract, Cigarette smoking, Slit lamp examination

I. Introduction

Smoking is a serious global public health hazard. According to WHO 1.1 Billion smokers are present, 4 million deaths for year, eleven hundreds for day. India is the third largest smoking country in the world [1].

Cigarettes contain thousands of chemical substances like formaldehyde, ammonia, and hydrogen sulfide that act as irritants, carcinogens and inflammatory agents, all of which can interfere with blood flow and damage eyes [2]. Research has established smoking as a definitive cause of serious, progressive disorders of the eye that can lead to partial or total vision loss. Heavy smokers and those who smoke for an extended number of years are particularly at risk of eye damage.

Smoking is responsible for a pronged attack on the eyes that can lead to the development of cataracts in two ways. First of all, tobacco smoke contains harmful free radicals that directly assault the eye, potentially damaging lens proteins [3]. and the fiber cell membrane in the lens. Secondly, smoking reduces the body's levels of antioxidants and certain enzymes which may help to remove damaged proteins from the lens.

Side stream smoke, involuntary smoking, secondhand smoke also causes eye complications like conjunctiva, sclera, episclera, cornea, lens, iris, retina, choroid, optic nerve, uveitis, blindness, visual loss, cataract [4], conjunctivitis, age-related macular degeneration.

Some of the effects in the eyes from cigarette smoking can be detected immediately. Cigarette smoke that hits the eye membrane can cause immediate irritation and redness. Smoke that is inhaled can take longer to restrict the blood flow to the retina, causing decreased eyesight [5]. Long term effects such as uveitis an inflammation of the middle layer of the eye and diabetic retinopathy, blood vessel damage associated with diabetes. The internal structures that contribute to vision such as the optic chiasm in the brain can also be effected by the chemicals from smoking by depriving the blood flow.

II. Material & Methods

The study was conducted in the OPD of ophthalmology department Konaseema institute of medical sciences Amalapuram, EG dist, Andhra Pradesh India. The present study was conducted on GROUP (A) 53 healthy male smokers and GROUP (B) 53 healthy male nonsmokers in the age group of 40-60 years from the Amalapuram city.

The inclusion criteria of smokers GROUP (A) (smoking group) includes, n=53 subjects who smokes cigarettes, bidi, tobacco roll, for a period 12 to 40 yrs, non alcoholics. The smoking index was calculated by the multiplication of average number of cigarettes/bidis smoked per day and duration (in years) of smoking. The exclusion criteria of our study are, female subjects, persons with previous eye surgery, eye diseases, eye trauma, diabetics, alcoholics, color blindness, congenital blindness, congenital deafness, and other ear diseases. All subjects were of same socio economical status. Detailed history of name, age, sex, occupation, personal history, personal habits are taken. Family history of hypertension, diabetes, refractive errors, and glaucoma were enquired.

Detailed smoking history was taken as follows, Name of the smoke (Cigarette, bidi, tobacco roll), number of smokes per day, Method of smoking (Reverse, normal), Regularity of smoking (Daily, occasionally), type of smoking habits (deep smoke or superficial smoke), type of cigarette (filter, non filter). The study protocol was ethically approved by the institutional ethical committee. An informed consent of the volunteers was taken on an approved proforma.

Slit lamp examination : Lens opacity was graded by Slit lamp examination and retro illumination photographs.

The slit lamp is essentially a simple and generally under-used piece of equipment. It consists of an illumination system and a binocular observation system [6]. which when correctly aligned will result in a coincidental focus of the slit and microscope, Slit lamp contain illumination system Basically a short focus projector projecting an image of the illuminated slit aperture on to the eye. This part of the system should be flexible to allow various sizes and shape of slit beam. Types of illumination are: Diffuse illumination, Direct (focal) illumination, narrow beam (optic section) broad beam (parallelepiped), Retro illumination[6].

Observation system Consists of a binocular microscope with parallel or convergent eyepieces. Generally magnification from 6x to 40x is allowed by varying the eyepiece and objective lens of the microscope. The illuminating system and observation system are normally focused at the same point coupled. The slit width is varied by rotating either the left hand or right hand.

III. Results :

Out of 53 smokers 13.20% (No.7) were in the age group of 40-50 years and 86.80% (No.46) were in the age group of 50-60 years. Out of 53 nonsmokers 30.19% (No. 16) were in the age group of 40-50 years and 69.81% (No.37) were in the age group of 50-60 years[9]. The percentage distribution of smoking index indicated that maximum percentage 71.69% (no. 38) of smokers have smoking index more than 450, followed by 28.31% of smokers have smoking index less than 300.

TABLE 1 : Comparative study of cataracts among smokers (No 53) and nonsmokers(No 53)

	NON SMOKERS	SMOKERS	P Value
Immature Cataract	52.83 % (No.28)	60.38 % (No.32)	0.0001
Mature Cataract	22.64 % (No.12)	28.30 % (No.15)	0.0001
Nuclear Cataract	09.43 % (5)	11.32 % (No.6)	0.0001
Nil Cataract	15.09 % (No.8)	0% (No.0)	0.0001

TABLE 1 depict the comparison of cataract among smokers and nonsmokers group. Incidences of Immature Cataract is more among the smokers 60.38% (No.32) than the nonsmokers 52.83% (No.28). Incidences of mature Cataract is more among the smokers 28.30% (No.15) than the nonsmokers 22.64% (No.12) [7]. Incidences of Nuclear Cataract is more among the smokers 11.32% (No.6) than the nonsmokers 09.43% (No.5) [8]. These results shows that there is highly statistical difference between smokers and nonsmokers in the formation of various types cataract [7].

TABLE 2 : Comparative study of cataracts among Type of smoking in smokers (No 53)

	SMOKERS	P Value.
Cigarette	13.21 % (No.7)	0.0001
Beedi	01.88 % (No 1)	0.0061
Tobacco Rool	84.91 % (No.45)	0.0001

TABLE 2: depict the comparison of cataract among type of smoking in the smokers. The association between cigarette smoking and cataract 13.21 % (No.7) and between bidi smoking and cataract 01.88 % (1) and between tobacco roll smoking and cataract 84.91% (No.45). Incidences of Cataract among the smokers is highest in the tobacco roll smokers 84.91 % (No.45), high in the cigarette smokers 13.21 % (No.7) [10]. very low among the beedi smokers 01.88 % (1) [11]. These results also shows very high incidence of cataract formation among the tobacco roll smokers [11].

IV. Discussion

Incidences of Immature Cataract is more among the smokers 60.38 % (No.32) than the nonsmokers 52.83 % (No.28). Incidences of mature Cataract is more among the smokers 28.30 % (No.15) than the nonsmokers 22.64 % (No.12). Incidences of Nuclear Cataract is more among the smokers 11.32 % (No.6) than the nonsmokers 09.43 % (5). These results shows that there is highly statistical difference between smokers and nonsmokers in the formation of various types cataract [12].

Incidences of Cataract among the smokers is highest in the tobacco roll smokers 84.91 % (No.45), high in the cigarette smokers 13.21 % (No.7), 13.21 % (No.7), very low among the beedi smokers 01.88 % (1). These results also shows very high incidence of cataract formation among the tobacco roll smokers [11].

Smoking boosts a person's risk of developing cataracts, an opacity in the lens of the eye. The data suggest that smoking causes 20 percent of all cataract cases. Statistical analyses revealed that men who reported smoking at least a pack (20 cigarettes) per day significantly greater risk of cataracts than did men who had never smoked. Smokers faced an estimated 200 percent increased risk of developing a posterior sub capsular cataract, and an estimated 100 percent increased risk of nuclear sclerosis cataract, a less serious form in which the opacity occurs in the center of the lens. Smoking is linked with macular degeneration [13]. Hypotheses include the suppression of antioxidants by tobacco smoke and impairment of blood circulation in the eye. Diets rich in fruits, vegetables and whole grains are high in antioxidants such as vitamin C and lutein, protects against cataract formation [14].

V. Conclusion

Smoking is associated with cataract in many persons. These data provide support for the hypothesis that cigarette smoking increases the risk of developing both nuclear sclerosis [8], and posterior subcapsular cataract. people who smoked and drank heavily had an increased prevalence of nuclear cataract.

Whilst increasing age is undoubtedly the main risk factor when it comes to cataracts, most common form are known as senile cataract [9]. Experts believe that cigarette smoking may in fact be responsible for up to 20 per cent of all cataracts. Statistical analyses revealed that men who smoke more than a pack a day increase their risk for cataracts by 200 per cent. For female smokers, the risk of developing cataracts increases by a still very significant 63 per cent. The risk of getting cataracts can be reduced by stopping smoking. Smoking has been strongly correlated with cataract formation in several studies. One of the best things you can do for your eye and overall health is to quit smoking. Even if you are not a smoker, being subjected to second-hand smoke may be just as dangerous to your eye health.

Quitting smoking is vitally important for our health and well being. Most of us are aware of the links between smoking and conditions such as heart disease, stroke, cancer and various lung diseases. The damage to vision caused by AMD [13] and cataracts takes an immense toll on a person's everyday life.

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