

A PROSPECTIVE OBSERVATIONAL STUDY TO ANALYZE THE CAUSES AND TYPES OF PRE SENILE CATARACT IN SOUTH INDIAN PATIENTSManoj Vasudevan¹, (Maj) G. Premnath²**HOW TO CITE THIS ARTICLE:**

Manoj Vasudevan, (Maj) G. Premnath. "A Prospective Observational Study to Analyze the Causes and Types of Pre Senile Cataract in South Indian Patients". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 53, October 16; Page: 12308-12315, DOI: 10.14260/jemds/2014/3626

ABSTRACT: Cataract is the opacification of the crystalline lens and or its capsule. Senile cataract is the cataract occurring commonly in the elderly who are above 50 years of age. It is one of the major causes of blindness in both the developing and the developed countries. Cataracts which develop prior to age of 50 are defined as pre senile cataract. There may be several reasons for an individual to develop such pre senile cataract. Some of the major identified risk factors are ocular trauma, uncontrolled diabetes, nutritional deficiencies, environmental factors like chronic exposure to sunlight as in tropics, cigarette smoking, refractive errors like high myopia, chronic intake of certain drugs for some systemic illness and certain ocular inflammatory diseases. **AIM AND OBJECTIVES:** To determine the various types of pre senile cataract and to determine the common causes of pre senile cataract. **DESIGN:** Prospective Observational study. **METHODS & MATERIALS:** The patients attending the out-patient clinics of the ophthalmology department who are found to have pre senile cataract and who give consent to participate in the observational study are requested to fill the questionnaire and undergo a complete ocular examination. The type of cataract and any cause of the cataract formation identified from the questionnaire, examination or investigations done are documented and analyzed using frequency distribution. **RESULTS:** 100 eyes of 54 patients were included in the study. Most common type of cataract was found to be posterior sub capsular cataract. The common causes identified were sunlight exposure, chronic steroid use, diabetes, uveitis and smoking. **CONCLUSION:** Protection from sunlight, avoidance of chronic steroid usage, screening and adequate control of diabetes, meticulous management of uveitis and avoiding cigarette smoking helps to prevent early development of cataracts.

KEYWORDS: Pre senile cataract.

INTRODUCTION: Cataract is the formation of opacity of the crystalline lens of the eyes. These usually are caused by degenerative changes in the lens often occurring after the age of 50 years.^{1,2} The foremost cause of blindness in the world is due to cataract. Cataract is one of the curable causes of blindness which is included in the VISION 2020, a global initiative taken by WHO to combat preventable, curable and avoidable blindness. Around 7.75 million people were affected with cataract in India above the age of 50 years in the year 2001 and it is expected to go to about 8.25 million by the year 2020 due to a substantial increase in the population above 50 years in India.³ 3.38 million people above 50 years were operated for cataract in the year 2001 in India and it is expected to rise to 7.63 million by the year 2020.³

Age related cataract is a multifactorial disease and different risk factors play a role in different types of cataract formation. Identifying the risk factors responsible for cataract formation is a very difficult and complicated problem because a realistic causal model in cataract formation is not yet

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identified but several epidemiological studies are being done and still are underway to establish several environmental factors as causative risks for the development of both age related and pre senile cataract. Pre senile cataract by definition is the occurrence of cataracts before the age of 50 years^{1,2}. Recently the incidence of early onset cataract is on the rise. This will definitely add on to the currently existing burden of age related cataract.

Though some of the landmark studies relating to this have clearly established several factors contributing to both age related as well as pre senile cataract formation the exact reasons for such occurrences are yet to be analyzed using many more large scale epidemiological studies worldwide. This study is one such observational study done to identify the risk factors attributable to the onset of cataract in patients younger than 50 years in south Indian population and also to determine the types of such cataracts in these individuals.

METHODS: The patients attending the out-patient clinics of the ophthalmology department of the hospital who were found to have pre senile cataract and who gave consent to participate in the observational study were included for the study. Patients who had congenital or developmental cataracts were excluded from the study. All the patients selected were requested to fill up a questionnaire consisting of their age which was confirmed with one of their identity proof, occupation and the amount of sunlight exposure per day, personal habitual addictions to tobacco and alcohol, dietary pattern, history of any systemic disorders like Diabetes mellitus, hypertension, tuberculosis, skin diseases, asthma, or any other diseases for which the patient is on long term drug therapy, any significant ocular trauma, use of any long term topical preparations and a detailed family history with any history of intra ocular surgery performed for the patient or their relatives. Following this weight and height are recorded to calculate the body mass index (BMI) and then a complete ocular examination is done to look for any evidence of intra ocular inflammatory conditions which predispose the individual to cataract formation like chronic uveitis. The eye having the cataract is documented, photographed and the type of cataract is categorized as immature, mature, hyper mature, posterior sub capsular cataract or any specific cataract based on the morphological appearance of the lenticular opacity.

ETHICS: The institutional human ethics committee approval was obtained for the conducting this study and the procedures followed were in accordance with the ethical standards of the responsible committee on institutional human experimentation and with the Helsinki declaration of 1975 that was revised in 2000.

STATISTICS AND RESULTS

The analysis was done using frequency distribution. The results are as follows: -

Table 1:

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Age (in years)	54	25	49	41.70	6.188

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Table 2:

Occupation		
	Frequency	Percent
AUTO DRIVER	1	1.9
BUSINESS	4	7.4
CIVIL	1	1.9
DRIVER	1	1.9
ELECTRICIAN	1	1.9
FANCY STORES	1	1.9
FARMER	5	9.3
GARDENER	1	1.9
HOME MAKER	21	38.9
HOTEL WORKER	1	1.9
HOUSE KEEPER	2	3.7
HOUSE MAID	1	1.9
MANUAL LABOUR	5	9.3
MASON	1	1.9
PLUMBER	1	1.9
SECURITY MAN	1	1.9
SHOP KEEPER	4	7.4
SUPERVISOR	1	1.9
TAILOR	1	1.9
Total	54	100.0

Table 3A:

Outdoor Activity^{9, 10}	
≤4 hrs	9 (16.7)
>4 hrs	21 (38.9)
Nil	24 (44.4)
Diabetes^{4, 11, 12}	
≤5 yrs	6 (11.1)
>5 yrs	7 (13.0)
Nil	41 (75.9)
Hypertension¹¹	
≤5 yrs	3 (5.6)
>5 yrs	3 (5.6)
Nil	48 (88.9)
Skin Disease¹³	
Yes	2 (3.7)
No	52 (96.3)

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Table 3B:

Ocular Trauma	
Blunt	1 (1.9)
Penetrating	2 (3.7)
Nil	51 (94.4)
Topical Steroid Use¹³	
>6 months	3 (5.6)
Nil	51 (94.4)
Systemic Steroid Use¹³	
>6 months	11 (20.4)
Nil	43 (79.6)
Sexually Transmitted Disease	
Yes	1 (1.9)
No	53 (98.1)
Similar Condition in Parents/Siblings	
Yes	1 (1.9)
No	53 (98.1)

Table 3C:

Consanguinity in Parents	
3 rd Degree	3 (5.6)
Nil	51 (94.4)
Tobacco Pack Per Yrs^{5, 15}	
>5 pack yrs	5 (9.3)
Nil	49 (90.7)
Alcoholism^{5, 14}	
>5 yrs	7 (13.0)
Nil	47 (87.0)
Asthma	
Yes	7 (13.0)
No	47 (87.0)
Refractive Error	
Short Sightedness	1 (1.9)
Long Sightedness	1 (1.9)
Nil	52 (96.3)

Table 3D:

Chemotherapy	
Yes	1 (1.9)
No	53 (98.1)
Sign of Intraocular Lesions¹⁶	
Yes	8 (14.8)
No	46 (85.2)
Laterality of Cataract	
RE	5 (9.3)
LE	3 (5.6)
BE	46 (85.2)
Type of Cataract	
IMC	15 (27.8)
MC	8 (14.8)
HMC	1 (1.9)
PSCC	25 (46.3)
Others	5 (9.3)
BMI¹⁵	
<18.5	3 (5.6)
18.5-24.9	31 (57.4)
≥25	20 (37.0)

DISCUSSION: A total of 100 eyes of 54 patients were finally evaluated. The mean age was 41.7 years. There were 20 males and 34 females in the study. In this study the most common type of cataract identified among the study group was posterior sub capsular cataract (PSCC). 46 of the 54 patients had bilateral cataracts at the time of presentation. The 6 major risk factors identified in this study were sunlight exposure (55.6%), steroid use (26%), diabetes (24.1%), uveitis (14.8%), alcohol consumption for more than 5 years (13%) and smoking cigarette^{5, 15} more than 5 pack years (9.3%). A standard drink of alcohol is one which has somewhere between 12-14 grams of alcohol.^{5, 14}

One pack year of smoking is defined as smoking 1 pack of cigarette daily for 1 year. In this study out of the 54 patients only 4 of them were pure vegetarians the rest of them consumed non vegetarian diet at least once a week. 31 patients had a normal BMI, 20 of them were overweight, while 3 of them were under weight. Majority of the patients who presented with pre senile cataract were women and 21 of the 34 patients were homemakers, 5 were farmers and 5 manual workers. The most frequent type of cataract was PSCC seen in 25 of the 54 patients; immature cataracts were seen in 15, total cataract (mature and hyper mature) in 9 and other non-specific types in 5 patients.

Two major landmark studies in the history of ophthalmology relating to the causes and risk factors for the onset of age related cataract are the Beaver dam study and the Blue Mountains eye study.

The BEAVER DAM STUDY⁴ in Wisconsin was a study conducted in 1988 on the prevalence and incidence of age related cataract to identify the causes of cataract. A 20 year follow up of the

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study was concluded in 2010, an important finding of the study was association of cigarette smoking with cataract.

The BLUE MOUNTAINS EYE STUDY^{5,6} in Australia; a population based cohort study was conducted to identify the risk factors for age related cataract formation. The study included dietary factors, smoking, alcohol consumption; medications and refractive errors of the individuals enrolled for the study for a 10 year period and followed up. Higher intakes of protein, vitamin A, niacin, thiamin, and riboflavin were associated with reduced prevalence of nuclear cataract. Intake of polyunsaturated fats was associated with reduced prevalence of cortical cataract. No nutrients were associated with PSCC. The nucleus of the lens is particularly sensitive to nutrient deficiencies. Protein, vitamin A, niacin, thiamin, and riboflavin protected against nuclear cataract. An important finding from the study is the association of cigarette smoking and dietary deficiencies in vitamins and proteins with cataract.

It is not yet possible to confirm that antioxidants in the diet have a major role to play in the prevention of cataract formation, but epidemiologic studies suggests that it is wise to consume diets rich in vitamin C, E and carotenoids to prevent the early development of cataracts.^{7,8}

CONCLUSION: Pre senile cataract incidence is on the rise due to changes in the lifestyle of the individual starting from his diet, habitual addictions, occupational stress, environmental influences and also due to early medical consultation due to the fast growing eye screening awareness programs. In general avoidance of direct exposure to sunlight as much as possible by use of umbrellas, protective sun goggles, regular screening for diabetes in high risk individuals and keeping them under good control, avoiding long term usage of topical or systemic steroids, refraining from use of tobacco and alcohol in any form, regular eye screening for any ocular or systemic disorders and having a healthy balanced diet rich in anti-oxidants with regular exercise will help us in retarding the early onset of cataract and probably might play a major role in delaying the onset of age related cataract as well.

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PATIENT QUESTIONNAIRE:

Name	Age	Sex
Occupation	No. of hrs outdoors	
H/o DM		
H/o HT		
H/o TB		
H/o Skin diseases		
H/o Trauma		
H/o Topical drug instillation		
H/o Oral medicines		
H/o STD's/HIV/HBV/Recent leptospirosis		
H/o work in hot environment		
H/o Veg/Non-veg diet		

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H/o parent/sibling affected	
H/o Consanguinity in parents	
H/o use of tobacco in any form	
H/o alcoholism	
H/o asthma	
H/o refractive error	
H/o chemo/radiotherapy	
H/o thyroid disease	
Height (in cms)	
Weight (in kgs)	
Laterality of cataract	
Type of cataract	
Any signs of uveitis/FHIC	
H/o intra ocular surgery	
H/o any body tumors	

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