



CATARACT; DIABETES AND SMOKING AS A MAJOR RISK FACTOR FOR CATARACT IN THE COMMUNITY POPULATION OF RESIDENTS OF LAHORE CANTT.

Zain Taseer¹, Muhammad Ather Khan², Saira Afzal³, Syed Amir Gillani⁴, Sabah Sarwar⁵

1. MBBS, MPH
Senior Demonstrator
Department of Community Medicine
Avicenna Medical College Lahore.
2. MPH, PhD
Professor & Head
Department of Allied Health
Sciences University of Lahore.
3. MBBS, FCPS, M.Phil, PhD
Assistant Professor
Chairperson and Head
Department of Community Medicine
King Edward Medical University
Lahore.
4. MBBS, MPH, PhD
Dean
Faculty of Allied Health Sciences
University of Lahore.
5. MBBS
Lecturer
Department of Pharmacology
Avicenna Medical College Lahore.

Correspondence Address:

Dr. Zain Taseer
Department of Community Medicine
Avicenna Medical College Lahore.
taseerzain@gmail.com

Article received on:

08/02/2018

Accepted for publication:

15/11/2018

Received after proof reading:

31/01/2019

ABSTRACT... Introduction: Cataract is a growing eye condition all over the world which ultimately leads to the loss of eyesight or blindness. Cataract is majorly an age related issue which is commonly observed in population of older age typically more than 40. **Objectives:** It is necessary that the risk factors which have association with the progress and development of the condition must be identified in order to prevent and manage the condition. **Study Design:** Case-Control study. **Setting:** Ophthalmology OPD of Avicenna Hospital Lahore. **Period:** 09 months. **Materials and Methods:** Total of 400 patients over the age of 40 years. They were further divided into 200 cases and controls in equal number. From the patients attending the eye OPD, cases were selected and they were examined under ophthalmoscope for diagnosis of cataract. For controls, different patients were selected that attended the hospital for conditions other than the cataract. The same diagnostic criterion was used to exclude any possibility of cataract in controls. The study included 12 risk factors which were, smoking, duration of smoking in years, number of cigarettes smoked, diabetes mellitus and duration, hypertension, duration of hypertension and medication used to counter hypertension, usage of corticosteroids, anti-depressants and obesity. Moreover, demographic data was also obtained. Data was gathered by using a structured questionnaire as a study tool. **Study Design:** Simple random sampling was used as sampling technique Matching was done for socio-economic characteristics to reduce the error. Information from the questionnaire was kept confidential. Odds ratio and statistical analysis was calculated by IBM SPSS Software version 22.0. **Result:** Through the study conducted in the population of Lahore visiting the Ophthalmology OPD of Avicenna Hospital it was found that among the risk factors studied that were responsible for the development of cataract, random sampling was used. Diabetes mellitus, hypertension, smoking along with the duration of smoking and socioeconomic status has shown significant association and were considered potential risk along with the age factor that was selected to be more than 40, which is the basic consideration in the development of age related cataract. Along with these factors, usage of anti-hypertensive medication, corticosteroids and anti-depressants didn't show any significant association with the development of cataract. **Conclusion:** It can be concluded from the study that the risk factors estimated for the development of cataract has shown significant association. However, it can be prevented by adopting some of the preventive strategies such as controlling the blood sugar level through healthy diet, management of hypertension, quitting smoking and most importantly it is necessary that people who have a history of cataract in family should visit eye clinics regularly for eye examinations.

Key words: Age Degeneration, Cataract, Diabetes Mellitus, Hypertension, Risk Factors, Statistical Analysis.

Article Citation: Tasser Z, Khan MA, Afzal S, Gillani SA, Sarwar S. Cataract; diabetes and smoking as a major risk factor for cataract in the community population of residents of Lahore Cantt. Professional Med J DOI; 26(2):229-241.

DOI: 10.29309/TPMJ/2019.26.02.3085

INTRODUCTION

Obscuring and loss of the vision because of obfuscating of the focal point in the eyes is for the most part portrayed as cataract. It is for the most part because of natural aging.¹ These days significant wellbeing concern all around the

globe includes the eye state of creating cataract.² As indicated by 2010 WHO information cataract was said to be the real reason for creating visual deficiency all through the world which accounts just about 51%. Among every one of the cataracts, age related cataract alone, contributes around 80

percent. As indicated by the area of murkiness age related cataract is named atomic, cortical or back sub capsular.³ Other than being the significant guilty party towards visual impairment, cataract can likewise prompt more prominent human services cost. Tragically in close past no such investigation was directed in Pakistan to decide the hazard components of cataract. There is learning holes display when all is said in done population of Pakistan with respect to chance elements of cataract. In United States the cost on cataract among eye human services constitutes around 21 percent in population of 40 years or more.¹ However the scope of costs is considerably higher for the individuals who age 65 years or all the more right around 68.6 percent. Among the population of Bangladesh, about 650,000 individuals were accounted for to get visually impaired at 30 years old years and more seasoned where cataract was the real reason in 80 percent. Be that as it may, among all eye surgeries, cataract operation constituted around 90%.⁴

In the current reports, commonness of the eye condition especially cataract is developing quickly with a scope of around 4.9 percent in Brazil expanding as high as 23 percent in Indonesia and Sweden.⁵ In India the pervasiveness of un-worked cataract in individuals over the age of 60 was 58% in north India and 53% in south India.⁶ As per Korean National Health and Nutrition Examination Survey, the common cataract ended up being 40%, which is once more, most noteworthy among the entire eye related diseases.⁷ Around the globe ladies are liable to a prior occurrence of cataract.⁸ Hence estimation of hazard factors is vital for building up general wellbeing design and limiting general wellbeing trouble. Different hazard factors have been recognized being developed of cataract.⁹ Certain restrictions are available to deal with every last hazard factors identified with cataract.¹⁰ This examination will concentrate on basically Diabetes^{11,12,13,14} Smoking is one of the modifiable hazard factors of cataract^{15,16,17} Two noteworthy hazard factors were related to cataract in Malay people which were commonly smoking and low financial status. Here 1 of every 6 atomic cataract cases in men could be ascribed to

smoking. The relationship of smoking to cataract improvement was accounted for to be higher in Malay than in white population.¹³ Smoking can be considered as a noteworthy hazard factor for cataract advancement.

Metal particles are observed to be available in the smoke of cigarette. In this manner, in another study correlation of levels of these metal particles was led in the examples of contributors that were named smokers and non-smokers. It was presumed that ladies are at higher danger of creating cataract; yet, the distinction in the levels of metal particles based on sexual orientation couldn't be resolved fundamentally. Notwithstanding, the measure of Molybdenum was observed to be diminished in men when contrasted with the ladies population.¹⁸ In another investigation on oxidative harm of focal point, it is proposed through confirmation that the presentation of eye to larger amounts of atomic oxygen can likewise quicken the age-related blurring of core of the focal point which at last prompts cataract.

The securing components of the eye which are in charge of the support of low oxygen incomplete weight around the focal point of the eyes are vital to play their capacity in ensuring the eye^{19,20} Low financial status and ineffectively instructed are more inclined to cataract.²¹ The impact of hyperglycemia on age-related cataract can be portrayed by means of galactokinase deficiency.^{19,20,21} Diabetes is likewise a noteworthy supporter of the arrangement of cataract. Patients with Type 2 Diabetes are at higher danger of creating cataract. In this way it is important to pay exceptional thought over eye examination in patients that are as of now experiencing Type 2 Diabetes.^{22,23,24} Consumption of the weight control plans that are significantly dependable to convey sugar into the blood quickly are likewise known to indicate relationship with the advancement of cataract and in addition different conditions, for example, age related macular degeneration, Type 2 Diabetes and cardiovascular issue.²⁵

As indicated by various investigations, hoisted weight list (BMI) that compares to corpulence is likewise answered to expand the danger

of cataract development.²⁶ Another meta-examination infers that hypertension that is co morbid with diabetes can serve to be a noteworthy hazard factor in cataract improvement especially back sub-capsular kind of cataract.¹⁰ Fundamental hypertension altogether builds the danger of cataract arrangement in the rodent eyes by means of balance of the cancer prevention agent safeguard system and electrolyte homeostasis^{31,27} Eating routine and dietary status assumes an essential part in development of cataract. Veggie lovers were at brings down danger of cataract than were meat eaters in an examination directed on British residents.¹¹ Association of age to cataract is watched more in ladies of more established ages than in men. However in men, cataract was observed to be related with age, diabetic condition, utilize antihypertensive prescription and folate inadequacy, and with age and antihypertensive pharmaceutical just in more established ladies.

Cataract because of folate deficiency was additionally present in more seasoned men who had a typical level of vitamin B2, B6 and B12. Indeed, even after the change of whatever is left of hazard factors, cataract related to folate deficiency was seen in more established men with the time of ≥ 75 years, while, diabetes and hypertensive pharmaceutical related cataract was found in men of age 65-74 years. The ponder additionally depicts that the more seasoned age that is ≥ 75 years stayed to be a hazard factor for cataract to create even in individuals without diabetes or those that does not take any medication to oversee hypertension and individuals with ordinary folate levels.²⁸

A population based settled case control contemplate uncovered expanded danger of cataract advancement in patients ceaselessly utilizing antidepressants.²⁹ In any case, the advancement of carotenoids, xanthophylls, B vitamins, and multivitamin supplements admission can be save strength of focal point, especially concerning lessening danger of atomic and, perhaps, cortical cataract.^{30,31} The utilization of topical caffeine in smaller scale molar sums has ended up being extensively

successful against diabetes related cataract by restraining the arrangement of galactose cataract.³² Consumption of green tea at a direct centralization of a normal of more than 500mL every day may help keep the event and movement of cataract with age.³³

Proteins of the focal point denaturation may happen by the actuation of calcium-subordinate compound, calpain. Magnesium (Mg^{2+}) assumes critical part not just in the support of low levels of calcium (Ca^{2+}) and sodium in focal point yet additionally in protecting the redox status of the lens.^{34,35}

WHO approximates demonstrate that as much as 82 % of the instances of loss of vision are accounted for by individuals having an age of 50 years or more noteworthy. Moreover, the predominance of feeble ophthalmic issue is relied upon to increment with developing expected a very long time of life because of a general change in therapeutic findings and administrations anticipated that in the years would come.³⁶

This epidemiological effect of cataract influences the countries by bringing about money related expenses to them as well as a social and compassionate issue for them as the decrepit population minimized to live with their cataract lead a low quality of life.^{37,38,39,40} Lessening of capacities and capacities frequently connected to other decrepit wonders do in reality add to the etiology of cataract.⁴¹

MATERIALS AND METHODS

Study Design

This investigation was hospital facility based and comprises of case and control groups. The groups were coordinated. The exploration for eye examination was led in the ophthalmology OPD of Avicenna Hospital Lahore with diminished vision. The investigation was planned and directed on the general population living in Lahore locality. In a planned report either two or majorly diabetes and diabetes related factors are included. In this regard a case control study was conducted to assess the parameters. The groups were matched

and odds ratios were calculated using SPSS software of both control and study groups. The research was conducted in the ophthalmology OPD of Avicenna Hospital Lahore.

Sample of Study Designed

The study included those people who visit OPD wards of ophthalmology OPD of Avicenna Hospital Lahore.

Sample Size

Sample size was determined by using the following equation:

$$n = \left(\frac{r+1}{r} \right) \frac{(\bar{p})(1-\bar{p})(Z_{\beta} + Z_{\alpha/2})^2}{(p_1 - p_2)^2}$$

For 80% power, $Z_{\beta} = .84$ and for the 0.05 significance level, Z_{α} would be 1.96. As there are equal number of cases and control, $r=1$. To get proportion of cases exposed, we used the equation:

$$p_{case\ exp} = \frac{OR p_{controls\ exp}}{p_{controls\ exp}(OR-1)+1} \quad p_{case\ exp} = \frac{2.0(.20)}{(.20)(2.0-1)+1} = \frac{.40}{1.20} = .33$$

Average person exposed = $(0.33+0.20)/2 = 0.265$. The number of sample was finally found out as;

$$n = 2 \frac{(.265)(1-.265)(.84+1.96)^2}{(.33-.20)^2} = 181 \quad n = 2 \frac{(.265)(1-.265)(.84+1.96)^2}{(.33-.20)^2} = 181$$

Along these lines the aggregate number of test was ascertained to 362 which were measurably critical. In which there were 181 cases and 181 controls. To decrease the possibility of mistake, test estimate was expanded to 200 cases and 200 controls. We have gathered information of 400 patients who went by Ophthalmology division OPD of hospital used by general public of Lahore. Consent was acquired from Ethical audit leading body of Hospital with a specific end goal to get the information of the patients. The information was gathered amid a time of 9 months. The patient's information included financial statuses, age of the patient, smoking propensities and nearness of illness conditions, for example, diabetes and hypertension. Furthermore, the

utilization of hypertensive pharmaceutical, antidepressants and corticosteroids by these patients was additionally incorporated into the patient's information.

Sampling Technique

Simple random technique of sampling was employed for the selection of patients to be included in the study. Biasness was minimized through this sampling technique.

Inclusion Criteria

1. Age of patients (years): 40 and above
2. Patients attending ophthalmology OPD of hospital in Lahore with diminished vision.
3. The controls will be selected from the patients attending the same hospital from which the cases were selected, for conditions other than the cataract.

Exclusion Criteria

1. Age less than 40 years
2. Patients of congenital cataract
3. Patients having any other eye disorder.

Study Setting

The research was conducted in the ophthalmology OPD of Avicenna Hospital Lahore.

Study Duration

The study was conducted over a period of 9 months after the approval of research.

Variables

The variables considered in the study were Diabetes as major factor along with Hypertension and smoking in association with diabetes in inducing cataract.

Data Collection Tools

Prior permission to participate in the study and also data was collected through self-structured questionnaire. A Case-Control study about was done in the Eye OPD of Avicenna Hospital facility in Lahore. A sum of 400 patients beyond 40 years old years were incorporated which was then separated into 200 cases and equivalent number of controls. Cases were chosen from the patients going to the eye OPD and were

analysed under ophthalmoscope for finding of cataract. The controls were chosen from the patients going to the healing centre for conditions other than the cataract. The same analytic criteria were utilized to reject any plausibility of cataract in controls. Information was accumulated by utilizing an organized survey as an investigation device. Coordinating was to limit the possibility of mistake. Data from the survey was kept secret as per standards set down in Helsinki assertion of Bio-Ethics.

Data Analysis

For data analysis SPSS (Statistical Package for Social Sciences) version 22.0 was used. Odds ratio for every risk factor was calculated. For quantitative data standard deviation was calculated and for qualitative data percentages were calculated. Bar and pie charts were used to present categorical data. The data was collected over the period of 9 months.

RESULTS AND DISCUSSION

The study included a total of 200 patients among which there were 55% with the age ranging from 41-55 years. However, within the range of 56-70 years there were 43.6% of a total 100%. This can be clearly seen in the table as well as in the Figure-1 below.

The study on the gender of the patients participating in the study revealed that most of the population suffering from cataract was male, comprising about 94% while the female population was only 12%. This is elaborated by results of SPSS in Figure-2 below:

The prevalence of cataract was determined in relation to different risk factors. Smoking habit is known to be associated with cataract. It can be seen from the table that there was an existing relationship between smoking habit and the development of cataract. Moreover, the smoking population only consisted of male. No such habits were found in female population. Missing percentage describes the missing responses provided by the patients. Below Figure-3 is the SPSS generated results:

The response of the population on the years of smoking was mostly missing. Among the patients of cataracts that also had habit of smoking, there were almost 22% of the population that were indulged in the habit of smoking for about 10 years. However, such patients were also present who had been smoking for 25 years.

The distribution of respondents by the years of smoking can also be seen in the Figure-4 below.

The study revealed that among the filled responses regarding the number of cigarettes smoked per day, there was high percentage of 5-10 cigarettes smoked which is about 16-18 percent of the total 100%. A lot of missing response was found upon evaluating the responses obtained by the patients. Figure-5 elaborates this:

Cataract is closely associated to the existence of diabetes. Diabetes is known to induce and progress the development of cataract. It can be clearly seen from the table that the patients who visited Ophthalmology OPD with the complaint of cataract already had diabetes. 63 percent of the population had positive response towards diabetes.

The distribution is illustrated in the form of figure below.

It can be seen from the table that the patients who visited Ophthalmology OPD of Avicenna Hospital Lahore with the diagnosis of cataract also had diabetes existing with duration of 5 to 10 years mostly. 34.5 % of the population had diabetes for 5 years whereas, 24.5 percent of the population had diabetes for over 10 years. However, only 3 percent had diabetes existing for over 15 years. This indicates the relation of diabetes with cataract.

The distribution of years of diabetes in these patients can be seen from the figure below.

ODDS RATIO OF THE RISK FACTORS

The tables presented below shows the risk factor for each variable. Odds ratio is calculated in order to estimate the relationship between the exposures of the subject to any factor that

is assumed to be a risk to develop the certain condition that is assessed in the study.

In the following study, risk factors especially smoking, diabetes both is evaluated in terms of risk that is estimated to develop cataract. The

tables below show cross tabulation of each risk factor (A) which are the percentage and count of risk factor for both cases and controls whereas table (B) shows the risk estimate for each risk factor at $p(<0.05)$ and confidence interval of 95%.

Frequency of Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	41-55	111	55.5	55.8	55.8
	56-70	88	44.0	44.2	100.0
	Total	199	99.5	100.0	
Missing	System	1	.5		
Total		200	100.0		

Table-I. Patient's demographic data:

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	188	94.0	94.0	94.0
	Female	12	6.0	6.0	100.0
	Total	200	100.0	100.0	

Table-II. Distribution of respondents by gender

Smoking					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	108	54.0	56.3	56.3
	Yes	84	42.0	43.8	100.0
	Total	192	96.0	100.0	
Missing	System	8	4.0		
Total		200	100.0		

Table-III. Distribution of respondents by risk factors

Years of Smoking					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5.00	27	13.5	32.5	32.5
	10.00	44	22.0	53.0	85.5
	15.00	8	4.0	9.6	95.2
	20.00	2	1.0	2.4	97.6
	25.00	2	1.0	2.4	100.0
	Total	83	41.5	100.0	
Missing	System	117	58.5		
Total		200	100.0		

Table-IV. Distribution of respondents by risk factors: years of smoking:

Number of Cigarettes Smoked					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5.00	36	18.0	46.2	46.2
	10.00	33	16.5	42.3	88.5
	15.00	2	1.0	2.6	91.0
	20.00	6	3.0	7.7	98.7
	25.00	1	.5	1.3	100.0
	Total	78	39.0	100.0	
Missing	System	122	61.0		
Total		200	100.0		

Table-V. Distribution of respondents by risk factors: number of cigarettes smoked per day:

Diabetes Millitus					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	74	37.0	37.0	37.0
	Yes	126	63.0	63.0	100.0
	Total	200	100.0	100.0	

Table-VI. Distribution of respondents by risk factors: diabetes:

Diabetes Duration					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	5.00	69	34.5	55.6	55.6
	10.00	49	24.5	39.5	95.2
	15.00	6	3.0	4.8	100.0
	Total	124	62.0	100.0	
Missing	System	76	38.0		
Total		200	100.0		

Table-VII. Distribution of respondents by risk factors: duration of diabetes:

Smoking Study Groups Cross Tabulation					
			Study Groups		Total
			Cases	Controls	
Smoking	Non-Smokers	Count % within Smoking	108 38.2%	175 61.8%	283 100.0%
	Smokers	Count % within Smoking	84 77.8%	24 22.2%	108 100.0%
Total		Count % within Smoking	192 49.1%	199 50.9%	391 100.0%

Table-VIII. Odds ratio of risk factor: Smoking

Risk Estimate			
	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for Smoking (Non-smokers / Smokers)	.176	.106	.295

Diabetes Study groups Crosstabulation					
			Study Groups		Total
			Cases	Controls	
Diabetes	Diabetic	Count % within Diabetes	125 70.8%	52 29.2%	178 100.0%
	Non-diabetic	Count % within Diabetes	74 33.3%	148 66.7%	222 100.0%
Total		Count % within Diabetes	200 50.0%	200 50.0%	400 100.0%

Table-IX. Odds ratio of risk factor: Diabetes

Risk Estimate			
	Value	95% Confidence Interval	
		Lower	Upper
Odds Ratio for Diabetes (Diabetic / Non-diabetic)	4.845	3.12	7.427

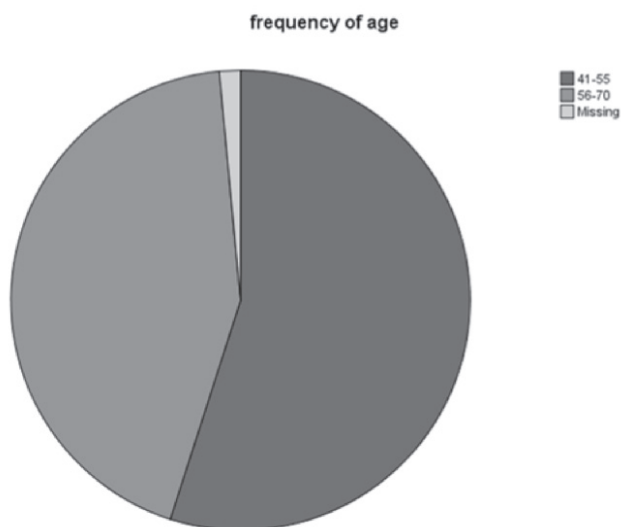


Figure-1. Frequency and percentage of age in years of patient

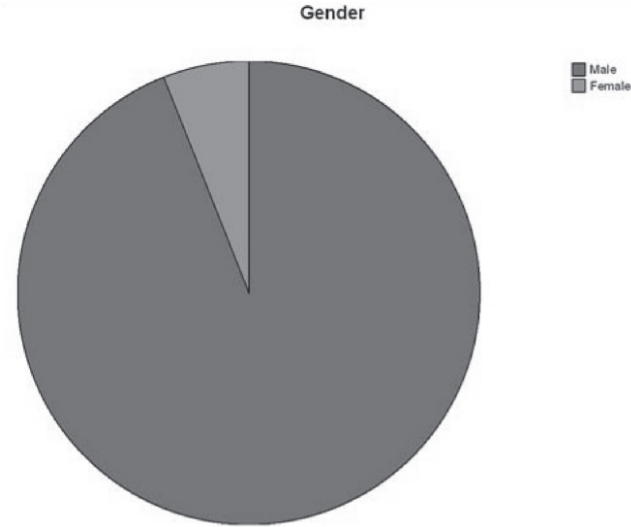


Figure-2. Distribution of respondents by gender

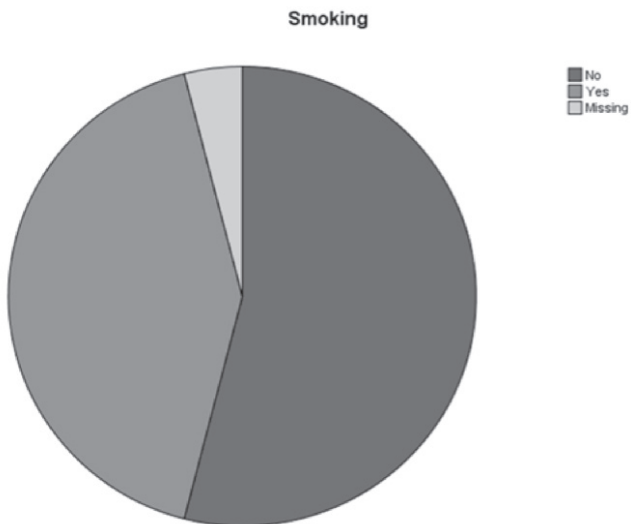


Figure-3. Distribution of respondents by risk factor: Smoking

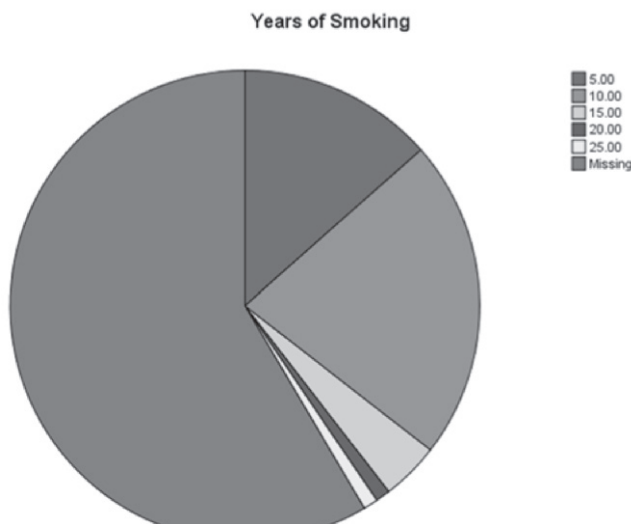


Figure-4. Distribution of respondents by risk factors: years of smoking

DISCUSSION

The present examination was led to decide a huge connection between 2 hazard factors including, smoking, years of smoking, number of cigarettes smoked every day, and diabetes alongside considering age and sexual orientation of the population contemplated.

It is evaluated that cataract create amid the more seasoned ages, for the most part after the age of 40. Age is thought to be a critical factor in population creating cataract alongside every extraordinary condition, for example, co-

morbidity and the financial status.⁴² men are at higher danger of creating cataract than females. However another imperative factor is the financial status. Individuals with low financial status create cataract more every now and again than the centre or high financial statuses' population. Additionally, absence of education rate have likewise demonstrated relationship to cataract.⁴³

The relationship of diabetes with cataract is outstanding.

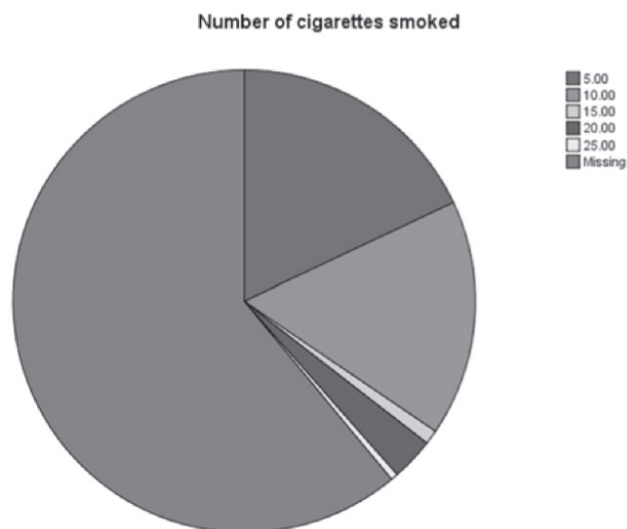


Figure-5. Distribution of respondents by risk factors: number of cigarettes smoked per day

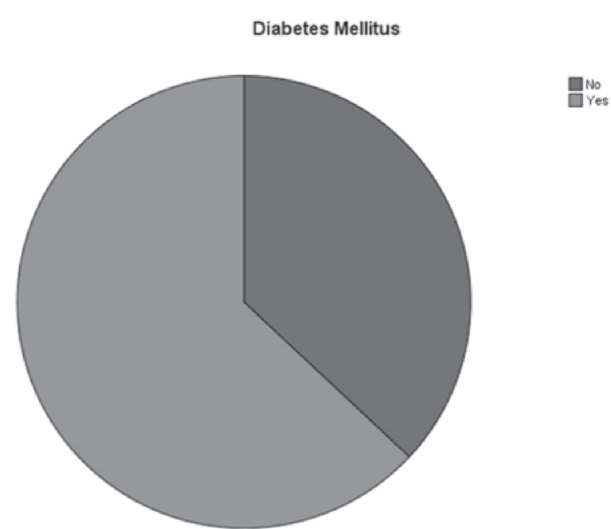


Figure-6. Distribution of respondents by risk factors: diabetes

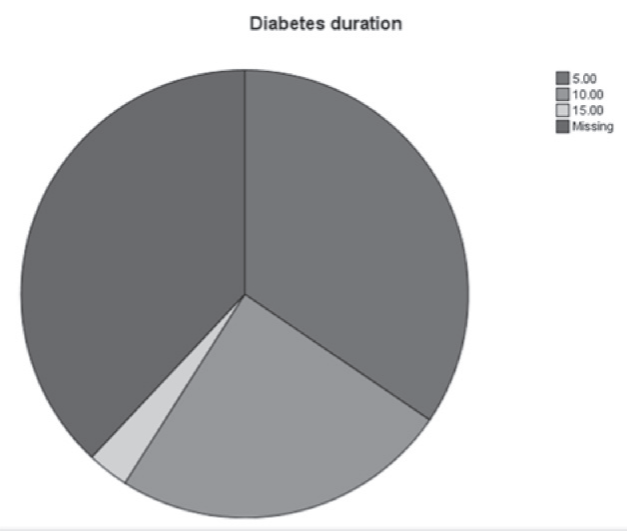


Figure-7. Distribution of respondents by risk factors: Duration of diabetes

Among the population considered in the examination, a large portion of the general population who had cataract likewise had diabetes enduring for very nearly 5 years or above. Diabetes as a rule causes retinopathies in quiet which can be related to the advancement of cataract.⁴⁴

Cataract has high relationship with smoking of cigarettes. The investigation demonstrated that individuals who smoked cigarettes much of the time for past 5-10 years have created cataract when contrasted with the non-smokers which

were taken as control.⁴⁵ As the examination was led in Pakistan, the relationship of cataract with liquor couldn't be resolved.

In addition, cataract likewise has known relationship with hypertension and the medicines used to oversee hypertension. The majority of the population creating cataract have been utilized either Atenolol or Lisinopril to deal with their hypertension. However the component behind this couldn't be determined.⁴⁶ Weight is likewise known to assume a part in cataract development.⁴⁷ Increase in the BMI ≥ 30 have demonstrated relationship with cataract. In the examination, a large portion of the population was corpulent or overweighed which is a typical example in the nation. However this expansion in weight can cause age related cataract in more seasoned ages.^{48,49} The utilization of antidepressants commonly SSRIs have a known relationship with cataract advancement which has been resolved in past studies.⁵⁰ however in the present examination the general population utilizing stimulant were not seen. Correspondingly, the relationship of utilization of corticosteroids as for cataract improvement couldn't be resolved in the present examination.

The present investigation additionally decided the inferable hazard related with the watched factors that were low financial status, absence of

education, smoking propensities, hypertension, diabetes and utilization of corticosteroids, hostile to hypertensive pharmaceutical and antidepressants in the number of inhabitants in Lahore, Pakistan. A broad and more exploratory examination is required to be led with a specific end goal to keep the advancement of cataract and diminishing the general proportion of the presence of cataract in more established population which is normally seen in Pakistan.

The present examination finishes up the main considerations that are associated with the improvement of cataract in the number of inhabitants in Lahore, Pakistan. The huge outcomes were acquired for the hazard factors including diabetes mellitus, hypertension, smoking, low financial status, utilization of antihypertensive medicine regularly atenolol and ignorance rate. The population incorporated into the investigation was over 40 years old as this was the real consideration criteria of the examination as the investigation depended on evaluating the age related cataract improvement in relationship with various components that may help the advancement of the condition. It was discovered that all the previously mentioned hazard factors were engaged with expanding the improvement of the cataract in the population examined.

As said, diabetes can be significant hazard factor in the advancement of cataract, it is fundamental that the patients precisely screen their weight control plans as far as the day by day glucose consumption. In addition the strength of the focal point can be enhanced by expanding the Vitamin C admission. The cell reinforcements give defensive consequences for the lens.⁵¹ Cessation of smoking can likewise help in enhancing the wellbeing of eyes as it is specifically connected with the atomic and back sub capsular cataract.⁵²

Daylight is likewise known to have relationship with cataract improvement. Accordingly, utilization of shades and defensive shades can decrease the danger of cataract advancement and progression.⁵³

It is likewise imperative that individuals who

have been determined to have cataract or have a family history of diabetes, hypertension or cataract should routinely visit optician so as to get their visual perception tried as they are at higher danger of create cataract.

CONCLUSION

It can be concluded from the study that the risk factors estimated for the development of cataract has shown significant association. However, it can be prevented by adopting some of the preventive strategies such as controlling the blood sugar level through healthy diet, management of hypertension, quitting smoking and most importantly it is necessary that people who have a history of cataract in family should visit eye clinics regularly for eye examinations.

Copyright© 15 Nov, 2018.

REFERENCES

1. Shih YH, Chang HY, Lu MI, Hurng BS. **Time trend of prevalence of self-reported cataract and its association with prolonged sitting in Taiwan from 2001 and 2013.** BMC Ophthalmol. 2014; 14:128.
2. Pascolini D, Mariotti SP. **Global estimates of visual impairment: 2010.** The British journal of ophthalmology. 2012; 96(5):614-8.
3. Jiang Z, Liang K, Zhang Q, Tao L. **Glutathione S-transferases polymorphisms confer susceptibility to senile cortical cataract in the Han Chinese population.** Molecular Vision. 2012; 18:1247-52.
4. Tanchangya J, Geater AF. **Use of traditional cooking fuels and the risk of young adult cataract in rural Bangladesh: a hospital-based case-control study.** BMC Ophthalmology. 2011; 11(1):16.
5. Lee D-S, Han K, Kim H-A, Lee S-Y, Park Y-H, Yim HW, et al. **The gender-dependent association between obesity and age-related cataracts in middle-aged Korean adults.** PloS one. 2015; 10(5):e0124262.
6. Vashist P, Talwar B, Gogoi M, Maraini G, Camparini M, Ravindran RD, et al. **Prevalence of cataract in an older population in India: The India study of age-related eye disease.** Ophthalmology. 2011; 118(2-19):272-8.e2
7. Yoon KC, Mun GH, Kim SD, Kim SH, Kim CY, Park KH, et al. **Prevalence of eye diseases in South Korea: data from the Korea national health and nutrition examination survey 2008–2009.** Korean J Ophthalmol. 2011; 25.

8. Carlos GA, Schellini SA, Espindola RF, Lana FP, Rodrigues AC, Padovani CR. **Cataract prevalence in Central-West region of Sao Paulo State, Brazil.** *Arquivos brasileiros de oftalmologia.* 2009; 72(3):375-9.
9. Gupta VB, Rajagopala M, Ravishankar B. **Etiopathogenesis of cataract: An appraisal.** *Indian Journal of Ophthalmology.* 2014; 62(2):103-10.
10. Yu X, Lyu D, Dong X, He J, Yao K. **Hypertension and risk of cataract: A meta-analysis.** *PloS one.* 2014; 9(12):e114012.
11. Appleby PN, Allen NE, Key TJ. **Diet, vegetarianism, and cataract risk.** *Am J Clin Nutr.* 2011; 93(5):1128-35.
12. Christen WG, Glynn RJ, Gaziano JM, Darke AK, Crowley JJ, Goodman PJ, et al. **Age-related Cataract in a Randomized Trial of Selenium and Vitamin E in Men: The Select Eye Endpoints (SEE) Study.** *JAMA ophthalmology.* 2015; 133(1):17-24.
13. Wu R, Wang JJ, Mitchell P, Lamoureux EL, Zheng Y, Rochtchina E, et al. **Smoking, socioeconomic factors, and age-related cataract: The Singapore Malay eye study.** *Arch Ophthalmol.* 2010; 128.
14. Ma T, Chen T, Li P, Ye Z, Zhai W, Jia L, et al. **Heme oxygenase-1 (HO-1) protects human lens epithelial cells (SRA01/04) against hydrogen peroxide (H₂O₂)-induced oxidative stress and apoptosis.** *Experimental eye research.* 2016; 146:318-29.
15. Sheng Y, He F, Lin J-F, Shen W, Qiu Y-W. **Tea and risk of age-related cataracts: A cross-sectional study in Zhejiang Province, China.** *Journal of Epidemiology.* 2016; 26(11):587-92.
16. Garcia Garcia E, Garcia Robles E. **Cataract: A forgotten early complication of diabetes in children and adolescents.** *Endocrinologia, diabetes y nutricion.* 2017; 64(1):58-9.
17. Zhu M, Yu J, Gao Q, Wang Y, Hu L, Zheng Y, et al. **The relationship between disability-adjusted life years of cataracts and ambient erythemal ultraviolet radiation in China.** *Journal of Epidemiology.* 2015; 25(1):57-65.
18. Langford-Smith A, Tilakaratna V, Lythgoe PR, Clark SJ, Bishop PN, Day AJ. **Age and smoking related changes in metal ion levels in human lens: Implications for cataract formation.** *PloS one.* 2016; 11(1):e0147576.
19. Beebe DC, Holekamp NM, Shui Y-B. **Oxidative damage and the prevention of age-related cataracts.** *Ophthalmic Research.* 2010; 44(3):155-65.
20. Babizhayev MA, Yegorov YE. **Telomere Attrition in Human Lens Epithelial Cells Associated with Oxidative Stress Provide a New Therapeutic Target for the Treatment, Dissolving and Prevention of Cataract with N-Acetylcarnosine Lubricant Eye Drops. Kinetic, Pharmacological and Activity-Dependent Separation of Therapeutic Targeting: Transcorneal Penetration and Delivery of L-Carnosine in the Aqueous Humor and Hormone-Like Hypothalamic Antiaging Effects of the Instilled Ophthalmic Drug Through a Safe Eye Medication Technique.** *Recent patents on drug delivery & formulation.* 2016; 10(2):82-129.
21. **Ghana National Report on World Health Organization's Study on global AGEing and adult health (SAGE) in Ghana, Wave 1.** Geneva: WHO; 2012 2012//.
22. Olafsdottir E, Andersson DK, Stefansson E. **The prevalence of cataract in a population with and without type 2 diabetes mellitus.** *Acta Ophthalmol.* 2012;90.
23. Obrosova IG, Chung SSM, Kador PF. **Diabetic cataracts: Mechanisms and management.** *Diabetes Metab Res Rev.* 2010;26.
24. Li L, Wan X-h, Zhao G-h. **Meta-analysis of the risk of cataract in type 2 diabetes.** *BMC Ophthalmology.* 2014; 14(1):94.
25. Taylor A. **Mechanistically linking age-related diseases and dietary carbohydrate via autophagy and the ubiquitin proteolytic systems.** *Autophagy.* 2012; 8(9):1404-6.
26. Ye J, Lou L-X, He J-J, Xu Y-F. **Body mass index and risk of age-related cataract: A meta-analysis of prospective cohort studies.** *PloS one.* 2014; 9(2):e89923.
27. Khan SA, Choudhary R, Singh A, Bodakhe SH. **Hypertension potentiates cataractogenesis in rat eye through modulation of oxidative stress and electrolyte homeostasis.** *Journal of Current Ophthalmology.* 2016; 28(3):123-30.
28. Chen KJ, Pan WH, Huang CJ, Lin BF. **Association between folate status, diabetes, antihypertensive medication and age-related cataracts in elderly Taiwanese.** *The journal of nutrition, health & aging.* 2011; 15(4):304-10.
29. Chou PH, Chu CS, Chen YH, Hsu MY, Huang MW, Lan TH, et al. **Antidepressants and risk of cataract development: A population-based, nested case-control study.** *Journal of affective disorders.* 2017; 215:237-44.
30. Weikel KA, Garber C, Baburins A, Taylor A. **Nutritional modulation of cataract.** *Nutrition reviews.* 2014; 72(1):30-47.

31. Glaser TS, Doss LE, Shih G, Nigam D, Sperduto RD, Ferris FL, 3rd, et al. **The Association of Dietary Lutein plus Zeaxanthin and B Vitamins with Cataracts in the Age-Related Eye Disease Study: AREDS Report No. 37.** *Ophthalmology*. 2015; 122(7):1471-9.
32. Varma SD, Kovtun S, Hegde K. **Effectiveness of topical caffeine in cataract prevention: Studies with galactose cataract.** *Molecular Vision*. 2010; 16:2626-33.
33. Sheng Y, He F, Lin JF, Shen W, Qiu YW. **Tea and Risk of Age-Related Cataracts: A Cross-Sectional Study in Zhejiang Province, China.** *J Epidemiol*. 2016; 26(11):587-92.
34. Agarwal R, Iezhitsa IN, Agarwal P, Spasov AA. **Mechanisms of cataractogenesis in the presence of magnesium deficiency.** *Magnesium research*. 2013; 26(1):2-8.
35. Agarwal R, Iezhitsa I, Awaludin NA, Ahmad Fisol NF, Bakar NS, Agarwal P, et al. **Effects of magnesium taurate on the onset and progression of galactose-induced experimental cataract: In vivo and in vitro evaluation.** *Experimental eye research*. 2013; 110:35-43.
36. Laitinen A, Laatikainen L, Härkönen T, Koskinen S, Reunanen A, Aromaa A. **Prevalence of major eye diseases and causes of visual impairment in the adult Finnish population: A nationwide population-based survey.** *Acta Ophthalmologica* 2010; vol. 88, no. 4, pp. 463–471.
37. Sheng Y, He F, Lin JF, Shen W, Qiu YW. **Tea and risk of age-related cataracts: A cross-sectional study in Zhejiang Province, China.** *J Epidemiol*. 2016; 26(11):587-92.
38. Agarwal R, Iezhitsa IN, Agarwal P, Spasov AA. **Mechanisms of cataractogenesis in the presence of magnesium deficiency.** *Magnesium research*. 2013; 26(1):2-8.
39. Agarwal R, Iezhitsa I, Awaludin NA, Ahmad Fisol NF, Bakar NS, Agarwal P, et al. **Effects of magnesium taurate on the onset and progression of galactose-induced experimental cataract: In vivo and in vitro evaluation.** *Experimental eye research*. 2013; 110:35-43.
40. Laitinen A, Laatikainen L, Härkönen T, Koskinen S, Reunanen A, Aromaa A. **Prevalence of major eye diseases and causes of visual impairment in the adult Finnish population: A nationwide population-based survey.** *Acta Ophthalmologica* 2010; vol. 88, no. 4, pp. 463–471.
41. Yawson AE, Ackuaku-Dogbe EM, Seneadza NAH, Mensah G, Minicuci N, Naidoo N, et al. **Self-reported cataracts in older adults in Ghana: Sociodemographic and health related factors;** *BMC Public Health* 2014 14:949.
42. Hiller R, Sperduto RD, Ederer F. **Epidemiologic associations with nuclear, cortical, and posterior subcapsular cataracts** *Am J Epidemiol*. 1986 Dec; 124(6):916-25.
43. Hodge WG, Whitcher JP, Satariano W. **Risk factors for age-related cataracts.** *Epidemiologic Reviews* 1995; 17:336-46.
44. Klein BE, Klein R, Moss SE. **Prevalence of cataracts in a population-based study of persons with diabetes mellitus.** *Ophthalmology*. 1985:1191-1196.
45. William G. Christen, ScD; Robert J. Glynn, ScD; Umed A. Ajani, MBBS; et al Debra A. **Schaumburg, ScD; Julie E. Buring, ScD; Charles H. Hennekens, MD; JoAnn E. Manson, MD Smoking Cessation and Risk of Age-Related Cataract in Men** *JAMA*. 2000; 284(6):713-716. doi:10.1001/jama.284.6.713.
46. Yu X, Lyu D, Dong X, He J, and Yao K. **Hypertension and Risk of Cataract: A Meta-Analysis** *PLoS One*. 2014; 9(12): e114012.
47. Cheung N and Wong TY. **Obesity and Eye Diseases** *Surv Ophthalmol*. 2007; 52(2): 180-195.
48. **Risk factors associated with age-related macular degeneration. A case-control study in the age-related eye disease study: Age-Related Eye Disease Study Report Number 3.** *Ophthalmology*. 2000; 107:2224–32.
49. Park S; Kim T; Cho S; Lee E. **Association between cataract and the degree of obesity association between cataract and the degree of obesity** 2013; 90(9):1019–1027.
50. Chou PH, Chu CS, Chen YH, Hsu MY, Huang MW, Lan TH, Lin CH. **Antidepressants and risk of cataract development: A population-based, nested case-control study.** 2017 Jun; 215:237-244. doi: 10.1016/j.jad.2017.03.044.
51. Fernandez, M., & Afshari, N. (2008). **Nutrition and the prevention of cataracts.** *Current Opinion in Ophthalmology*;19; (1):66–70.
52. Cumming, RG., Mitchell, P., Alcohol, **Smoking, and Cataracts The Blue Mountains Eye Study** *Arch Ophthalmol* 1997;115(10):1296-1303.
53. Collman, G W., Shore, D L., Shy, C M., Checkoway, H., and Luria, A S., **Sunlight and other risk factors for cataracts: an epidemiologic study.** *Am J Public Health*. 1988; 78(11): 1459–1462.



Those who don't know **history** are destined to **repeat** it.



“Edmund Burke”

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Zain Taseer	Corresponding Author	
2	Muhammad Ather Khan	Co-author	
3	Saira Afzal	Co-author	
4	Syed Amir Gillani	Co-author	
5	Sabah Sarwar	Co-author	