

*Original research article***A CROSS SECTIONAL STUDY ON THE PREVALENCE OF CATARACT AMONG PATIENTS WITH TYPE II DIABETES ABOVE 50 YEARS IN A PRIMARY HEALTH CENTRE IN CHENNAI**Advithi S¹, Aravind G², Arun Murugan S³, Ramasubramanian R⁴, Arulmozhi P⁵, SathishKumar K⁶

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Article infoReceived on 7th November 2023Accepted on 29th November 2023Published on 16th December 2023<https://doi.org/10.61986/ijpem.v1.i1.2023.5>**Abstract**

Introduction: Cataract is one of the major causes of visual impairment in diabetic patients. This study was done to find out the prevalence of cataract among diabetics above 50 years in a primary health centre in Chennai.

Objectives: To find out the prevalence of cataract among diabetics above 50 years in a primary health centre in Chennai.

Material and methods: This study is a descriptive cross-sectional carried out at Kollumedu Primary Health centre during the time period of June 2022 - September 2022 among 200 diabetic patients who come for treatment. Clinical and demographic details like age, sex, occupation, ocular examination findings, type of cataract, and other clinical details were collected using a detailed questionnaire. The samples were selected by convenient sampling technique. Data was analysed using SPSS version 20 software.

Results: This study revealed that 40% of the participants above the age of 50 years of age had cataract, which is a significant proportion of the diabetic population. About 6% of the participants were newly diagnosed to be having cataract.

Conclusion: Periodic ocular examination has to be recommended for the patients having Type II diabetes.

Keywords: Prevalence, cataract, Type II diabetes

Introduction

The prevalence of diabetes mellitus (DM) is increasing on a daily basis, with the International Diabetes Federation estimating that there will be 439 million DM patients by 2030¹. An aging population and longer patient life expectancy also means that the prevalence of DM will exceed 33% by 2050². DM can lead to pathologies in many tissues in the eye structure, with both a systemic chronic metabolic disease and a microangiopathic

character³. Cataract is one of the major causes of visual impairment in diabetic patients⁴. Patients with DM are reported to be up to five times more likely to develop cataract, in particular at an early age⁵⁻⁸. Due to the increasing prevalence of DM, the incidence of diabetic cataracts has also risen. Cataract extraction is one of the most common surgical procedures among the general population, and the number of cataract surgeries each year also continues to increase. Recent technological advancements in cataract surgery have improved

surgical outcomes. However, in diabetic individuals, the scale of improvement is still a matter of debate, and many studies have revealed both the results and complications of cataract surgery in diabetic patients⁹. Different types of mechanisms have been proposed for the pathogenesis of cataract in cases of DM. It has been suggested that the polyol pathway-via which the enzyme aldose reductase (AR) catalyzes the reduction of glucose into sorbitol-is a central part of the mechanism of cataract development¹⁰⁻¹². Multiple studies have been conducted to explain the AR pathway's role in this process. The increased intracellular accumulation of sorbitol leads to a hyperosmotic effect, resulting in hydropic lens fibers that degenerate and form cataract^{10,13}. The production of sorbitol in diabetic patients (as compared to nondiabetic patients) takes place more quickly than it can be converted into fructose by the enzyme sorbitol dehydrogenase. Intracellular removal of sorbitol through diffusion is also prevented because of its polar character. A hyperosmotic effect is created when an accumulation of sorbitol results in an infusion of fluid. Finally, animal studies have shown that the intracellular accumulation of polyols causes liquefaction of lens fibers resulting in the formation of lens opacities^{10,11,13,14}. In a study by Oishe et al¹⁴, it was found that AR levels in red blood cells of patients under the age of 60 and with short duration of DM had a positive correlation with the prevalence of posterior subcapsular cataract. Moreover, a negative correlation was reported between the level of AR in erythrocytes and the density of lens epithelial cells, which is known to be lower in diabetics than in nondiabetics. These findings suggest that AR may play a role in this mechanism. Osmotic stress as a result of extensive swelling of the cortical lens fibers is another compounding mechanism in the rapid development of cataracts, especially in young patients with type 1 DM. Hence, it necessitated the conduct of the study with the objective to find out the prevalence of cataract among diabetics above 50 years in a primary health centre in Chennai.

Material and methods

This was a descriptive cross sectional study conducted among patients with Type II Diabetes more than 50 years of age coming for treatment at Kollumedu PHC in Thiruvallur District, Chennai from June 2022 to September 2022. Data was collected from 200 eligible participants during the study period. Those who were not willing to participate were excluded from the study. Institutional ethics committee approval was obtained and informed consent was obtained from the study participants. Clinical and demographic details like age, sex, occupation, ocular examination findings using hand held torch, type of cataract, and other clinical details were collected using a detailed questionnaire. Participants were selected by convenient sampling technique. Data was entered and analysed in Microsoft Excel. Descriptive statistics like percentages were used.

Results

Majority (65.0%) of the respondents were males. Hypertension was the most common comorbidity which existed along with diabetes among the participants (Table1). Table 2 shows that prevalence of cataract among diabetics was 40%, of which immature cataract was the most common type of cataract. The most important finding in this study was that, about 6% of the participants were newly diagnosed to be having cataract.

Table 1: General characteristics of the participants

Variable	Categories	Frequency
Gender	Male	130 (65.0)
	Female	70 (35.0)
Other comorbidities	Hypertension	48 (24.0)
	Hypothyroid	14 (7.0)

Table 2: Prevalence of cataract.

Variable	Categories	Frequency
Presence of cataract	Yes	80 (40.0)
	No	120 (60.0)
Type of cataract	Mature	8 (10.0)
	Immature	32 (30.0)
	No cataract	120 (60.0)
Awareness of the condition	Newly	12 (6.0)
	Already	28 (14.0)

Discussion

This study revealed that 40% of the participants above the age of 50 years of age had cataract. Majority of the participants in this were suffering from immature cataract (30%). The prevalence of cataract among cataract among diabetics was 29% in a nationwide study done in India¹⁴. Different epidemiological studies also report that cataract is a common cause of visual impairment among diabetic patients and diabetic persons are more likely to develop cataract than non-diabetic persons¹⁵⁻¹⁷. A study based on India also reports that a prolonged exposure to hyperglycemia is associated with higher risk of cataract among diabetic patients¹⁸. Increasing age and poor glycemic control are the important risk factors of cataract; whereby, macroalbuminuria and anemia are the risk factors of cataract among patients with shorter duration of diabetes and among the newly diagnosed diabetic patients¹⁸. Diabetes mellitus (DM) as a health condition certainly affects a person's quality of life¹⁹. A person who is suffering from DM is vulnerable to different other medical complications with a substantial risk to develop different eye problems²⁰⁻²¹. India is home to a significant number of diabetic individuals and the older adults who suffer from diabetes carry a significant risk of developing eye problems like cataract. This study revealed a relationship between occupation and cataract.

Conclusions

This study revealed that 40% of the participants above the age of 50 years of age had cataract,

which is a significant proportion of the population in kollumedu. It was observed that about 6% of the participants were newly diagnosed to be having cataract. Therefore, health awareness programs can be initiated for this population and periodic ocular examination has to be recommended for diabetic patients.

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Conflict of interest

none

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