



## Original Article

## Association between Type of Cataract According to LOCS Classification with Diabetes Mellitus

Nawar Jan<sup>1</sup>, Muhammad Ahmad<sup>2</sup>, Maria Liaqat<sup>3</sup>, Samia Iqbal<sup>4</sup>, Muhammad Mujahid<sup>1</sup>, Saleem Ullah<sup>5</sup>, Tallat Anwar faridi<sup>6</sup><sup>1</sup>Department of Ophthalmology, Mayo Hospital, Lahore<sup>2</sup>Ramzan Eye and Dental Clinic.<sup>3</sup>University College of Medicine and Dentistry, University of Lahore.<sup>4</sup>Department of Public Health IUB, Bahawalpur<sup>5</sup>Department of Ophthalmology, Lahore General Hospital, Lahore<sup>6</sup>Department of Public Health University of Lahore, Lahore

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## \*Corresponding Author:

Samia Iqbal

Department of Public Health IUB, Bahawalpur  
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## ABSTRACT

Prevalence of diabetes mellitus has increased over time. DM has several adverse effects on body, out of which cataract is the most common ocular complication. Cataract is found to be more common in patients with diabetes mellitus due to changes in the metabolism of body.

**Objectives:** To determine the association of type of cataract according to LOCS classification with diabetes mellitus. **Methods:** The age of the patients was in the range of 25-80 years old. The inclusion criteria were the diabetic patients having the diabetic history of more than 8 years. Patients who were older than 80 years old and who had a history of any systemic disease were disqualified from the trial. All of the patients who were included underwent thorough eye examination. **Results:** 98 patients were included in the study having positive history of diabetes mellitus. The most common kind of cataract in people with diabetes is PSCC. There were 51 participants with posterior sub-capsular cataract (PSCC) (52.0 percent). This was followed by nuclear sclerosis cataract in twenty (20.04%) patients and cortical cataract in twelve (12.2%) individuals. In contrast, diabetic patients only experienced posterior polar cataract in seven (7.1%) patients and nuclear sclerosis and PSCC in the remaining eight (8.1%) patients. **Conclusions:** Diabetic mellitus patients should be checked for PSCC, which can impair vision, particularly in bright light, or during the day.

## INTRODUCTION

Patients with diabetes mellitus are more likely to develop cataract up to five times at an early age particularly [1]. Increase in the incidence of diabetes mellitus has given rise to cataract resultantly [2, 3]. Several procedures of cataract extraction have been introduced. However, in individuals having diabetes, improvement scale is a matter of deliberation, and many studies have shown complications of cataract surgeries in patients of diabetes [4]. Research of different studies recommended that the polyol pathway through the monosaccharose reductase (AR) catalyzes aldohexose reduction into sorbitol- pathway which is a central part of the mechanism of development

of cataract [5, 6]. Many studies were conducted to clarify the role of AR pathway within the method of cataract development and the accumulation of sorbitol intracellularly ends up in hyperosmotic result that provides rise to hydropic lens fibers that then degenerate and cataract forms [7]. Sorbitol production takes place faster in diabetic patients as compared to non-diabetic patients. Removal of sorbitol intracellularly takes place through diffusion. In a very recent study it had been found that AR levels in patients underneath the age of sixty and people United Nations have polygenic disease from short length had a direct correlation with the prevalence of

posterior subcapsular cataract (PSSC) [8]. Moreover, indirect correlation was testified between the extent of AR in erythrocytes and therefore the lower density of lens tissue cells that is understood in diabetics than in non-diabetics. These outcomes prompt that AR could cause the formations of posterior capsular cataract [9]. The swelling of the tissue lens fibers that causes diffusion stress is another combining mechanism that contributes within the speedy development of cataracts, particularly in young patients [10]. Since the endoplasmic reticulum (ER), which is the primary location where protein synthesis occurs, is stressed as a result of the diffusion stress, free radicals are created. The variation of aldohexose levels, which damages lens fibres with aerophilic pressure, is another source of the pressure in the emergency room [11]. Additionally, when the quantity of aldohexose in bodily fluids increases, lens proteins should glycate, which results in the production of advanced glycation end products. According to some research, diffusion stress in the lens that results in sorbitol buildup kills lens tissue cells involuntarily [12, 13]. By creating a hypoxic environment that leads to cataract development in diabetes patients, quick glycemic control may further intensify these effects within the lens. [14].

## METHODS

The study was conducted in Department of ophthalmology, The university of Lahore teaching Hospital Lahore from May to November 2020. It was a descriptive cross sectional study. Patients between 25-80 years of age with diabetes have been covered in the study. The diabetic patients having history of diabetes for at least 8-9 years were included. Patients having age greater than 80 years and having history of any systematic disorder was excluded. Data were analyzed using SPSS version 25.0.

## RESULTS

In this study, Ninety-eight (n=98) patients were enrolled with positive history of diabetes. Table 1 shows the age with percentages i.e., 25-40 years (23.4%), 41-55 years (39.7%), 56-70 years (26.5%) and remaining 10.2% with the age of 71-80.

Age	Frequency	Percent
25-40	23	23.4
41-55	39	39.7
56-70	26	26.5
71-80	10	10.2
Total	45	100

**Table 1:** Descriptive Statistics

Table 2 shows most typical form of cataract is PSSC in diabetic mellitus. Subjects with posterior sub-capsular cataract (PSSC) were fifty one (52.0%). This was followed by nuclear sclerosis cataract in twenty (20.04%) and cortical

cataract in twelve (12.2%) patients, whereas in diabetic patients posterior polar cataract was seen in 7 (7.1%) patients and remaining eight (8.1%) had PSSC and nuclear sclerosis as represented in Table 2.

Age	Frequency	Percent
PSSC	51	52
Nuclear Sclerosis	20	20.4
Cortical Cataract	12	12.2
Posterior Polar Cataract	7	7.1
PSSC and Nuclear Sclerosis	8	8.2
Total	98	100

**Table 2:** Types of Cataract

## DISCUSSION

Our study result showed that posterior sub-capsular cataract (PSSC) is the most typical variety of cataract in diabetic patients with prevalence of fifty one (52.0%). It absolutely was followed by nuclear sclerosis cataract in twenty (20.04%) and plant tissue cataract in twelve (12.2%) diabetic patients, whereas in diabetic patients posterior polar cataract was less common and seen in 7 (7.1%) patients and remaining eight (8.1%) had PSSC and nuclear sclerosis cataract. According to a recent study, those between the ages of 36 and 50 had the highest rates of lens clouding. When the same survey was published in 2003, it was unquestionably discovered that forty-four percent of people had cataracts [15]. In the current investigation, there were 79 (85.9%) cases of cataract with polygenic condition, and was absent in 20 (19.6 percent) of cases. Taking into account the frequency of females afflicted by polygenic condition, cataract was observed in thirteen (14.1%) and missing in eighty-two (80.4%) patients among non-diabetics. According to a prior study, diabetic individuals were included in the investigation. The cataract cluster served as a substitute for the management cluster in the first cluster [16]. The findings showed that females were more prevalent in the cataract cluster than in the management cluster [17]. Out of 194 patients, 63 (52.94%) were female and 29 (38.66) were male patients who received cataract surgery. The incidence of polygenic disorder was observed to be higher in females as compared to males [18]. In a recent study, researchers looked at the frequency of cataracts in people with and without diabetes. According to the research, 274 people had polygenic disorders, and 256 of them did not have diabetes. The type of cataracts determined within the study were 5% having cortical cataract, forty eighth nuclear cataract and 42.5% PSSC in diabetic patients [15]. It is thus concluded that CC was the foremost common subtype, among the monotype cataracts in patients with sort a pair of DM (15.1%). The mix of PPSC, NC and CC was the foremost common (19.5%) within the mixed sort cataracts. Results of another showed important relationship between polygenic

disorder and PSCC [19]. This study found 43 (54.43%) PSCC, 14 (17.72%) cortical cataracts, and 17 (21.51%) nuclear cataracts in diabetes individuals, which was unquestionably higher than the results of the previous study. While among non-diabetic individuals, three (23.07%) had PSCC, one (7.59%) had premature lenticular alterations, six (46.15%) had nuclear sclerosis cataract, and three (2.37%) had cortical cataract (23.07 percent). Thus, one of the fundamental goals for future research on cataracts must be to accelerate the development of pharmaceutical treatment and safe methods for cataract extraction [20].

## CONCLUSION

Diabetic mellitus patients should be checked for PSCC, which can impair vision, particularly in bright light, or during the day.

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