

# Acute Bilateral Cataract in Patient with Type 1 Diabetes Mellitus and Celiac Disease

Ashish Kumar Bhagat<sup>1</sup>, Harnoor Bhardwaj<sup>2</sup>, Bachan Lal Bhardwaj<sup>3</sup>, Sanjay Goyal<sup>1</sup>, Salil Jaura<sup>4</sup>, Pallav Jain<sup>4</sup>

## Introduction

Cataract represents one of the most frequent eye complications in type 1 DM and type 2 DM patients; contrarily, acute cataract in young diabetic patients occurs very rarely. Only few cases with acute bilateral cataract - all relatively shortly after the diagnosis of type 1 DM have been reported. It can affect visual acuity from slight visual impairment to complete blindness. Although usually associated with chronic hyperglycaemia, it may also occur on rapid restoration of euglycaemia.<sup>1</sup> Early detection of diabetes and adequate glycaemic control, particularly in female adolescents, may prevent this debilitating complication of diabetes.

## Case Report

A 21-year-old female was diagnosed as type 1 DM/Celiac disease 3 yrs back when she presented with complaints of polyuria, polydipsia, weight loss and put on insulin therapy. 3 months back patient developed sudden blurring of vision in both eyes which progressed over a duration of 7 days. On ophthalmologic examination visual acuity was found to be restricted to hand movements in both eyes. There was no history of previous eye problems and visual acuity was normal in both eyes at the start of treatment. Slit-lamp biomicroscopy revealed dense cortical cataracts bilaterally. No fundus details were visible in either eye. She was diagnosed as having bilateral acute irreversible metabolic cataract. She had no antecedent trauma, life-threatening diarrhea, or renal failure, and no exposure to drugs known to be associated with cataracts, such as steroids, barbiturates, phenothiazines



Fig. : Patient showing bilateral mature cortical cataract

and diuretics. There were no features to suggest chronic hypocalcaemia, or a family history of cataracts, DM, Celiac disease, thyroid disorder or rheumatoid arthritis. The HbA1c level was 8.9% (NV-<6.5%) and FPG -285 mg/dl (NV-<126mg/dl). B.urea-28mg/dl (20-40mg/dl), S.creatinine-0.8mg/dl (0.5-0.9mg/dl), Na<sup>+</sup>-142meq/l (135-155meq/l), k<sup>+</sup>-4.2meq/l (3.5-5.5meq/l). Hemogram revealed Hb-10gm/dl (12.0-15.8), tlc-9400(3.54-9.06 x 10<sup>3</sup>), dlc-neutrophils-69/lymphocytes-28/basophils-01/eosinophils-02(neutrophils-40-70%/lymphocytes-20-50%/basophils-0-6%/eosinophils-0-2%). Urine examination revealed sugar 4+, ketone bodies were absent. UGI endoscopy revealed flattening of duodenal fold. Duodenal biopsy showed focal areas of villous atrophy along with inflammatory cells in lamina propria. Anti tTg antibody levels were 140units/ml (>9 units/ml is considered positive for celiac disease). The patient was treated with bilateral phaco emulsification once sugar levels fell within normal limits.

## Discussion

Young patients with diabetes mellitus can present with eye problems during the early course of the disease and treatment. The exact mechanism of diabetic cataract is not known although it is thought to be related to poor glycaemic control and abnormalities in the polyol pathway. Reduction of glucose to sorbitol by aldose reductase (AR) leads to accumulation of sorbitol, which produces osmotic stress. It also produces oxidative stress by depleting cofactor NADPH that is an important cofactor for regeneration of reduced glutathione (GSH).<sup>2</sup> Some authors also mention the probable importance of genetic factors in their case studies but the mechanism is still poorly understood.<sup>3</sup> Some other researchers have suggested that rapid glycemic improvement on institution

of insulin therapy leads to a hypoxic phenomenon which may also affect the activities of the protective enzymes in the lens, resulting in increased oxidative stress and subsequently to acute cataract formation.<sup>4</sup> The factors associated with cataract in young persons with diabetes include high HbA1c levels, adolescence and female gender.<sup>5</sup> A female preponderance has been suggested in various case series on acute cataracts and newly diagnosed cases of type 1 diabetes.<sup>6</sup>

## Conclusion

In conclusion, acute-onset visual loss from cataracts is an unusual manifestation of type 1 diabetes. These cataracts once developed can be irreversible in spite of good metabolic control and require surgical intervention. Clinicians should stress on adequate and gradual control of hyperglycemia in newly diagnosed type 1 diabetes adolescents while at the same time balancing the risk of rapid glycaemic control in these patients.

## Abbreviations

DM: Diabetes mellitus; NV: Normal value; FPG: Fasting plasma glucose; NADPH: Nicotinamide adenine dinucleotide phosphate.

## References

- Sharma P, Vasavada AR. Acute transient bilateral diabetic posterior subcapsular cataracts. *J Cataract Refract Surg* 2001; 27:789-794.
- Lee AWY, Chung SSM. Contribution of polyol pathways to oxidative stress in diabetic cataract. *FASEB J* 1999; 13:23-30.
- Lang-Muritano M, La Roche GR, Stevens JL, Gloor BR, Schoenle EJ. Acute cataracts in newly diagnosed IDDM in five children and adolescents. *Diabet Care* 1995; 18:1395-1396.
- Yuen KCJ, Day JL, Flannagan DW, Rayman G. Diabetic neuropathic cachexia and acute bilateral cataract formation following rapid glycaemic control in a newly diagnosed Type 1 diabetic patient. *Diabet Med* 2001; 18:854-857.
- Datta V, Swift PGF, Woodruff GHA, Harris RF. Metabolic cataracts in newly diagnosed diabetes. *Arch Dis Child* 1997; 76:118-120.
- Lang-Muritano M, La Roche GR, Stevens JL, Gloor BRP, Schoenle EJ. Acute cataracts in newly diagnosed IDDM in five children and adolescents. *Diabetes Care* 1995; 18:1395-1396.