

## Case report: Treatment of vitreous hemorrhage in the presence of diabetic retinopathy

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### Introduction

Cardiovascular diseases are a major cause of incapacitation and mortality globally [1, 2].

Current statistics of diabetes mellitus is also a matter of concern. Diabetes mellitus (DM) is the third most prevalent disease after cardiovascular diseases and cancer. According to the WHO, the global number of patients with DM is around 285 million, and by 2025, it is expected to rise to 435 million [2]. In developed European countries, the estimated prevalence of DM in the general population varies from 3 to 10%, and in at risk and elderly patients it is as high as 30%. The prevalence of DM in Ukraine increases substantially year by year and the number of diabetic patients in the country exceeds one million. It is noteworthy that this number increases mainly due to those with type 2 DM. In patients diagnosed with DM before the age of 30 years, the incidence of diabetic retinopathy (DR) after 10 years is 50%, and after 30 years 90%. The incidence of DR in patients with type 1 DM is 42%, and in those with type 2 DM it exceeds 80%. DR rarely develops within 5 years of the onset of diabetes or before puberty [2]. About 5% of type 2 diabetics have DR at presentation.

The pathogenesis of DR involves imbalanced carbohydrate metabolism and retinal microangiopathy [3, 4]. Diffuse retinal ischemia, increased anaerobic glycolysis, development of local acidosis and venous stasis result in deep hypoxia and initiation of proliferative processes [3-5].

Diabetic retinopathy is the main but not the only cause of visual impairment in patients with DM [4, 5].

Changes in ocular media [3] also degrade the quality of the image projected onto the retina. Thus, corneal epithelial dystrophy, transitory edema of lens fibers in hyperglycemia, diabetic cataract and vitreous hemorrhage can contribute to visual impairment in diabetic patients [3].

**The purpose** of the study was to report a case of unilateral vitreous hemorrhage developed in the presence of diabetic retinopathy.

### Materials and Methods

A 16-year-old girl presented to the Emergency Room of the Eye Center at the Rivno Regional Pediatric Hospital

in January 2016 with a 2 week history of gradual visual loss in her right eye. Her medical history was significant for 11 years of type 1 diabetes mellitus treated with insulin. In addition, endocrinologist's opinion was that of "severe type I diabetes mellitus and life-threatening hyperglycemia". The patient reported wearing spectacle correction for myopia since age fourteen.

The patient underwent standard ophthalmological examination.

**Right eye:** unaided visual acuity (VA), 0.2; VA with spectacle correction, 0.9; refractive error, myopia of 2.0 D; IOP, within the normal range (estimated by palpation). Anterior segment biomicroscopy was unremarkable. Fundus examination revealed an optic disc of a pale rose color, with clearly defined margins, narrow and tortuous arteries, dilated veins, and artery to vein ratio of 1:4; macular and foveal reflexes were normal.

**Left eye:** unaided VA, 0.04; refraction, not possible because of media haze; IOP, within the normal range (estimated by palpation). Biomicroscopy revealed diffuse corneal edema; moderately deep anterior chamber; clear aqueous humor; round pupil of 3-mm diameter; clear lens; and thickening of the posterior capsule of the lens. In addition, pupillary reactions were normal. Partial vitreous hemorrhage was observed. Fundus details were not visible by ophthalmoscopy.

The provisional diagnosis based on history, patient's complaints, and results of ophthalmological examination was as follows: Vitreous hemorrhage of the left eye; diabetic retinopathy; bilateral low myopia; severe type I diabetes mellitus; life-threatening hyperglycemia.

The treatment regimen included: type II physical activity regimen (involving sitting on the bed with her feet on the floor for 30 minutes a day; ambulating in the hospital room; having her meals while sitting on the bed or on the chair; using mobile toilet facility; doing some therapeutic exercises in the hospital room); diabetic diet; Rheopolyglucine, i.v. drops, 200 ml, once daily, for 2 days; calcium gluconate, i.v. bolus, 5.0 ml, once daily, for 3 days; vitamin C, i.v. bolus, 1.0 ml, once daily, for 3 days; Metamax, subconjunctivally, 0.5 ml, once daily, for 6 days; Metamax, retrobulbarly, 0.5 ml, once daily, for 4 days; heparin, parabulbarly, 5000 units, 0.5 ml, once daily, for 2 days; Dicynon, i.v. bolus, 1.0 ml, once daily, for 3 days; Dicynon, retrobulbarly, 1.0 ml, once daily, for

2 days; L-Lysine aescinat, i.v. drops, 5 ml, once daily, for 2 days; Ascorutin, 1 tablet orally TID for 14 days; and potassium iodide 3%, glucose 40%, and Cornergel, 1 drop, QID, for 14 days.

On completion of that treatment, the patient was administered Metamax, orally, 250 mg, TID for 30 days. In addition, she was advised to abstain from physical activities for 30 days.

Retinal optical coherence tomography with Topcon 3DOCT 2000 (Topcon Corporation, Tokyo, Japan) was performed 2 months and 6 days after the onset of medical treatment. The follow-up duration was 10 months.

### Results and Discussion

The clinical case is interesting for the presence of diabetic retinopathy combined with vitreous hemorrhage, both of which can cause macular edema [1]. Intravitreal antiproliferative treatment has been reported to be indicated for the patient's condition [1, 2]; however, it would not be the treatment of choice since it can pose a high risk for the development of ischemic zone within the retina. Laser photocoagulation may also contribute to increased retinal ischemia, and result in exacerbation of the patient's condition; in addition, it is not indicated in the presence of vitreous hemorrhage [2, 5]. That is why a decision was made to use conservative treatment for the condition.

The treatment outcome was visual improvement and improvement in ocular status.

The ocular status at the time of discharge was as follows:

Right eye: unaided VA, 0.3; VA with spectacle correction, 0.95; refractive error, myopia of 2.0 D; quiet eye in the correct position. The cornea was clear, near spherically shaped, moist and sensible. The anterior chamber was moderately deep, and was filled with clear aqueous humor. The pupil was round, with a diameter of 3 mm, and pupillary reactions were normal. The lens and vitreous were clear. Fundus examination revealed an optic disc of a pale rose color, with clearly defined

margins, narrow and tortuous arteries, dilated veins, artery to vein ratio of 1:4, macular and foveal reflexes were normal.

Left eye: unaided VA, 0.08; VA with spectacle correction, 0.1; refractive error, myopia of 2.0 D; eyelid hematoma; subconjunctival hemorrhage. The cornea was clear, moist and sensible. The anterior chamber was moderately deep, and was filled with clear aqueous humor. The pupil had a diameter of 3 mm, and pupillary reactions were normal. Thickening of the posterior capsule of the lens was noted. Filaments resulting from vitreous hemorrhage were observed. Retinal and subretinal flame-like hemorrhages were noted. Fundus examination revealed an optic disc, with partially defined margins, narrow and tortuous arteries, dilated veins, no macular reflexes and no foveal reflexes.

At month 5, the clinical picture was as follows:

Right eye: unaided VA, 0.5; VA with spectacle correction, 1.0; refractive error, myopia of 2.0 D; no changes in the anterior eye were observed. The lens and vitreous were clear. The fundus showed no changes as compared to previous fundus examination.

Left eye: unaided VA, 0.5; VA with spectacle correction, 0.9; refractive error, myopia of 2.0 D; the eye was quiet; no changes in the anterior eye were observed. The vitreous was clear, and isolated filament-like inclusions were seen in the vitreous. Fundus examination revealed an optic disc of a pale rose color, with clearly defined margins, narrow and tortuous arteries, dilated veins, artery to vein ratio of 1:4, and chorioretinal focus in the inferior retinal periphery. In addition, macular reflex was normal.

At month 10, there was no change in the patient's ophthalmological assessment.

### Conclusion

The outcome of the conservative therapy for vitreous hemorrhage in the presence of diabetic retinopathy confirms that the therapy is effective and can be used for the treatment of the condition.

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