

Management of Angle Closure Glaucoma in a Myopic Pregnant Woman during the COVID-19 Pandemic – A Case Journey

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ABSTRACT

Introduction: We present a case of a young Caucasian myopic patient with secondary ACG and the management during her pregnancy amidst the COVID-19 pandemic. Angle closure glaucoma (ACG) is an uncommon condition in younger myopic individuals. Thus, ACG in pregnancy is not well researched and no definitive guidelines exist for its treatment.

Case Report: This 27-year-old female patient had been diagnosed with hypertensive uveitis and referred to the glaucoma clinic where peripheral anterior synechiae (PAS) was noticed on gonioscopy. As she had subacute angle closure glaucoma symptoms, she had been started on topical pilocarpine drops. She remained stable and under our regular follow up (dates). At her review in January 2021, she notified us that she was 27 weeks pregnant. She had continued pilocarpine drops once a day. Pilocarpine is a category C drug (with potential foetal risk though lack of human studies). Pilocarpine was advised to be stopped in the clinic as intra-ocular pressure is known to stabilise during pregnancy. She was further reviewed in the third trimester and had an uneventful delivery with a healthy baby. Her last review was post-pregnancy. She remained asymptomatic and her intra-ocular pressures were stable for the entire duration.

Conclusion: Our case was an unusual presentation of subacute angle closure secondary to PAS in a young myopic female. Her management of pregnancy in the COVID-19 pandemic when secondary to the social distancing rules was challenging as the clinic reviews are limited. We successfully managed timely reviews without risking the patient or the baby of any potential side effects to pilocarpine or COVID-19.

Keywords

Angle Closure Glaucoma, COVID-19, Pilocarpine, Pregnancy.

Abbreviations

ACG: Angle Closure Glaucoma; IOP: Intraocular Pressure; COVID 19: Corona virus disease 2019; PAS: Peripheral anterior synechiae; BCVA: Best corrected Visual acuity; FDA: U.S. Food and Drug Administration.

Introduction

Angle-closure glaucoma (ACG) is a group of diseases in which there is appositional (reversible) or adhesional (synechial) closure

of the trabecular meshwork resulting in elevation of the intraocular pressure (IOP).

ACG can be primary or secondary and acute or chronic. The secondary form may be contributed by a range of pathology such as uveitis [1]. ACG is uncommon in younger and myopic individuals [2]. As a result, ACG in pregnancy is poorly researched and currently no definitive guidelines exist for its treatment. Treating this condition during pregnancy can be quite complicated, especially during the peak of the Corona Virus Disease 2019 (COVID 19) pandemic when social distancing rules applied, and patient-doctor contact was reduced.

In this report we detail an unusual case of a young patient with mild myopic astigmatism who developed secondary ACG and her subsequent management during the COVID 19 pandemic, which had to be stopped due to pregnancy.

Case Report

A 27-year-old Caucasian myopic lady presented with right eye ACG secondary to uveitis in 2017. She came to the Acute Eye Clinic with a painful, red right eye. She was diagnosed with acute anterior uveitis with increased ocular pressure (64 mmHg). The examination of the left eye did not reveal any pathology. Although no previous ocular history was elicited, a family history of psoriasis was recorded. She was treated with intravenous acetazolamide and topical glaucoma medications to reduce IOP in clinic and sent home on topical corticosteroid and glaucoma medications. Most of the glaucoma drops were stopped after a week and the topical steroids were tapered. Brinzolamide drops were continued in the affected eye.

Unfortunately, a few weeks later, the patient presented back with an acutely painful right red eye. On examination, she had a sluggishly reacting pupil, presumably due to iris ischaemia from her hypertensive uveitis and an intraocular pressure of 24 mmHg with mild aqueous flare. Gonioscopy revealed sectoral (superotemporal, over 90 degrees and 3 clock hours) peripheral anterior synechiae (PAS) with a dragged and peaked pupil (pupillary ectopia) corresponding to the area of PAS. The angle remained reasonably open over the other quadrants with mild trabecular pigmentation. The patient was left on topical brinzolamide and a tapering course of steroid drops.

At review, a few months later the IOP normalized and all pressure-lowering drops were stopped. However, as she complained of symptoms of intermittent angle closure, a trial of topical pilocarpine was prescribed to see if this could alleviate the symptoms.

She remained asymptomatic on preservative free topical pilocarpine, nocte for the next two years. She retained Best corrected Visual acuity (BCVA) of 6/6 in the affected eye and the PAS persisted.

During the COVID 19 pandemic, the patient had to be managed appropriately without unnecessary hospital visits. The patient presented to the clinic for scheduled follow-up and reported that she was 27 weeks pregnant. The patient had been taking pilocarpine throughout her first trimester. As pilocarpine is a category C drug from the toxicological point of view (with potential foetal risk though lack of human studies), a detailed discussion was had where the patient was happy to stop applying the drops. The patient remained asymptomatic during and after the pregnancy despite being on any drops, when we reviewed her via monthly telephonic consultations. She had a healthy baby boy following an uncomplicated vaginal delivery.

On her last recorded follow up, 4 weeks postnatally, she remains asymptomatic with BCVA of 6/9 and an intraocular pressure of 14

mmHg in the affected eye. She remains under our regular follow up care.

Discussion

We have described a young patient who developed angle closure glaucoma and had to be managed during the COVID pandemic while being pregnant. As per our knowledge, no similar cases have yet been reported. ACG is a condition usually affecting the older population (peak age between 55 and 70 years) [3] and associated with an acute increase in intraocular pressure (IOP). Though it is rarer in the younger age group, several isolated cases have been described in the literature [4-6]. These younger patients usually have structural dysgenesis or developmental pathologies in their eyes as the contributing mechanism instead for their angle closure.

As glaucoma is usually a disease affecting the elderly, angle closure in pregnancy is uncommon [7]. It is challenging to study this topic due to the ethical and legal constraints along with the problems of conducting large randomized clinical trials on this patient population [8]. Hence, the bulk of the evidence available regarding this condition is made up of isolated case reports and animal studies. As a result, no unified guidelines exist for dealing with these patients. This was further confirmed by a survey which showed 31% of ophthalmologists were unsure how to handle these cases [9]. Pregnancy-induced hormonal changes normally mean there is a slight drop in the IOP in normal eyes during pregnancy. However, the IOP changes in pregnant women are still unpredictable with a reported 10% of patients experiencing an increase of their IOP and progression of glaucoma [10]. There is additional evidence that labour can precipitate acute angle closure attack [11]. This presents a further challenge as most of the medical management of glaucoma could have potential adverse effects on the foetus and the infant. The U.S. Food and Drug Administration (FDA) has categorised glaucoma medications in order to highlight the safety of each medication in pregnancy (Table 1) [8]. Ideally glaucoma medications should be stopped during pregnancy especially the first trimester (first 12 weeks) when organogenesis occurs and hence, there is a high chance for drug induced teratogenesis. Our patient presented to the clinic for review whilst being 27 weeks pregnant. She had unfortunately, continued to apply pilocarpine, a category C drug throughout this time. This had the potential to cause foetal abnormalities or problems with the pregnancy, which fortunately were not confirmed till date.

Table 1: FDA classification for medications and their teratogenicity.

Category A	Significant evidence from controlled studies suggests there is no risk to the foetus
Category B: brimonidine	Either animal studies may show risk, but human studies do not; or animal studies show no risk whilst there being no human studies. Thus, the evidence suggests no risk in humans.
Category C: timolol, latanoprost, dorzolamide, pilocarpine	There is a lack of human studies with animal studies being positive for risk or also lacking. Therefore, it is not possible to rule out risk, but the potential benefits may outweigh any risk.
Category D	Initial investigation data shows a positive risk to the foetus, but the potential benefits still may outweigh the risk.
Category X	Animal/human studies confirm harm to the foetus, resulting in drugs in this category being contraindicated in pregnancy.

A common feature that causes angle closure is a short, hyperopic eye with shallow anterior chamber depth and a thickened lens [12]. Myopic patients on the other hand have deeper anterior chamber depth, large anterior chamber volumes with long axial lengths. Therefore, myopic patients usually are prone to primary open angle glaucoma and are unlikely to suffer from ACG as their baseline draining angle is broad [13,14]. This makes our patient an unusual case as she had ACG as a myope.

The COVID-19 pandemic was an unprecedented problem that changed the landscape of ophthalmology outpatient services. Patients coming into ophthalmology clinic rooms have close contact with ophthalmologists and are directly touching the optical equipment. The surface of these instruments presents a potential route for COVID-19 transmission. This also means both the ophthalmologists and their patients have a high risk of becoming infected. Social distancing rules further complicated the picture. Risk mitigations strategies were implemented to protect patients and ophthalmologists. Elective care was suspended while telemedicine consultations were initiated for appropriate eye conditions to diminish clinic crowding [15]. Patients had to be triaged which would often pose a difficult decision as to which patients were classed as urgent (who would need to come to the hospital) or non-urgent. This made managing our patient challenging as the treatment of her ACG had to be weighed up along with the risk of being exposed to COVID-19.

Conclusion

When prescribing Glaucoma medications to women of the reproductive age, it is imperative ophthalmologists inform them of the potential side effects of the treatment on the foetus. As soon as pregnancy is suspected, drops should be discontinued wherever possible. During the present COVID-19 pandemic, this group of patients need regular telemedicine consultations at the least to monitor their condition and prevent any ocular emergencies.

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