

*Research Article***Gonioscopy in angle closure suspect patients**

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Abstract

Introduction: Glaucoma is an optic nerve disease of progressive course and it is one of the main diseases that can cause blindness worldwide. Fortunately glaucoma can be avoided with prophylaxis, this makes early detection and therefore early treatment is critical. **Aim of the study:** To detect PACG suspects using gonioscopy. **Patients and Methods: Study Design:** A prospective cross-sectional observational study. **Study Population:** The study was done in Minia University hospital ophthalmology department on forty PAC suspect patients. It was performed between April 2019 and December 2019. **Results: 1-Demographic data & basic characteristics:** The mean age of the patients was 46 ± 10.2 years (range: 25 to 65 years). Twenty-eight patients (70 %) were females and twelve patients (30%) were males. Patients with positive family history of angle closure glaucoma were nine (22.5%) while thirty-one patients (77.50%) were negative for family history.

Keywords: Glaucoma, gonioscopy, blindness

Introduction

Glaucoma is an optic nerve disease of progressive course and it is one of the main diseases that can cause blindness worldwide. Fortunately glaucoma can be avoided with prophylaxis, this makes early detection and therefore early treatment is critical.^[1]

Glaucoma causes loss of the ganglion cells of the retina which is responsible for the changes seen in the optic nerve head, the defects present in the visual field and the loss in the nerve fiber layer of the retina. For VF to show a defect, at least 40% of RGCs have to be lost, therefore early diagnosis in the glaucoma suspect stage is very important.^[2]

Two types of glaucoma suspect are known: Primary Open angle and primary angle closure suspect.^[3]

Primary angle-closure suspects can be recognized by gonioscopic visualization of the trabecular meshwork only in 180° or less of the angle of the anterior chamber, but on condition that the intraocular pressure is normal and the optic nerve head shows no structural damage.^[4]

Aim of the study

To detect PACG suspects using gonioscopy.

Patients and Methods**Study Design:**

A prospective cross-sectional observational study.

Study Population:

The study was done in Minia University hospital ophthalmology department on forty PAC suspect patients. It was performed between April 2019 and December 2019.

Ethical Consideration:

The persons taken in this study were told about the details, risks and the nature of the study. An oral consent was obtained from all included patients. The local committee of ethics in the faculty of medicine in university of Minia has approved it. Also, it was consistent with the Helsinki Declaration tenets.

Inclusion criteria:

1. Age (30-70yrs).
2. Shallow AC known by Van Herick test:

The patient was seated on the slit lamp (Sun Kingdom, China) with putting the chin on the chin rest and the forehead against the forehead rest. A slit light beam was adjusted to be perpendicular to the corneal periphery. At an angle of about 60° from the light beam the oculars of the slit lamp were placed.

The anterior chamber depth was graded by comparing it to the thickness of the cornea.

- 1:1 – Open angle, VH grade 4.
 - 1:1/2 – Open angle, VH grade 3.
 - 1:1/4 – Narrow angle, VH grade 2 (Angle Closure is possible).
 - 1: <1/4 – Angle closure is likely, VH grade 1.
- Hyperopes with Nidek® autorefractometer and with retinoscopy.
2. IOP ≤ 21 as measured by Goldmann applanation tonometry (Keeler, UK).
 3. Normal optic nerve head (ONH) appearance on fundus examination with both direct ophthalmoscope (Keeler, VISTA20, UK) and central lens of Goldmann 3 mirror lens (Ocular, USA).
 4. Normal visual field on static auto-mated perimetry (SAP) testing using a 24-2 protocol and a SITA-Standard strategy done with HUMPHREY FIELD ANALYZER (754i, Germany).

5. Family history of primary angle closure disease.

Exclusion criteria

- 1- Eyes with significant corneal opacity that can impair signal strings of any of the used imaging modalities.
- 2- Eyes with history of intraocular surgery (e.g. cataract surgery, retinal detachment surgery).

Results

Demographic data & basic characteristics:

The mean age of the patients was 46 ± 10.2 years (range: 25 to 65 years). Twenty-eight patients (70%) were females and twelve patients (30%) were males. Patients with positive family history of angle closure glaucoma were nine (22.5%) while thirty-one patients (77.50%) were negative for family history. Patients with hypermetropia are 40(100%). (Table 3).

Table 2: Showing demographic data and basic characteristics of the studied group:

	Range (25-65yrs)	Mean ± SD 46±10.2
Age		
Sex	Female 28 (70%)	Male 12 (30%)
Patients with positive family history of angle closure glaucoma	+ve: 9 (22.5%)	-ve: 31 (77.50%)
Patients with hypermetropia	40(100%)	

BCVA, C/D Ratio, slit-lamp examination, refraction & visual field test of the studied group:

The median BCVA (Log MAR) was 0.3 (the IQR of BCVA was 0.2 to 0.3) The median IOP was 15 mmHg (IQR: 14- 17 mmHg). The

median C/D ratio was 0.3(IQR was 0.3 to 0.3). Eyes with shallow AC on slit-lamp examination was 34(42.5%). Patients with normal visual field test were forty (100%) Patients with hypermetropia are forty (100%) (Table 4).

Table 3: showing BCVA, C/D Ratio, slit-lamp, refraction & visual field test of the studied group:

BCVA	Median :0.3	IQR:0.2-0.3
C/D ratio	Median:0.3	IQR:0.3-0.3
Slit-lamp	Shallow AC 34(42.5%)	-ve: 46(57.5%)
Visual field test	Normal: 40 (100%)	Abnormal: 0 (0%)
Refraction	Median: +3	IQR: +2.25 to +3

Discussion

Angle closure glaucoma is one of the sight threatening diseases and is a major cause of worldwide blindness.

A relationship was found between configuration of anterior chamber and primary angle closure (PAC). It was proved that shallow anterior chamber and narrow angle were significant risk factors for PACG. so, measurement of intraocular pressure (IOP) and evaluation of anterior chamber angle are important for the prevention and early treatment of PACG.

Anterior chamber Assessment can be done by multiple methods as Van Herick technique, gonioscopy, and ultrasound bio microscopy (UBM).

As regarding Van Herick technique, it is simple and doesn't need direct contact with the ocular surface, but it is highly subjective.

Gonioscopy is considered the standard method for angle examination. It is very accurate in assessing Anterior chamber width.

Unfortunately, although UBM is very helpful in examination of anterior chamber angle, it has some difficulties as the need to place patient in supine position and to apply a topical anesthetic and an ocular cup to the eye also, it requires skill and is equipment dependent, thus, it is not suitable for screening for narrow angled eyes.

Summary & Conclusion

Angle closure glaucoma is one of the major diseases that can cause blindness all over the world, so early detection and therefore early treatment is critical.

The aim of this study is to screen for angle closure suspect patients using gonioscopy. This prospective cross-sectional study included 30 patients (18 females and 12 males, 60 eyes) with the range of age between 35 and 70 years. They were recruited from ophthalmology outpatient clinic of Minia University Hospital.

All patients underwent detailed ophthalmological examination including IOP measurement, slit lamp examination of AC. Gonioscopy was done

Data were collected, revised, verified, coded then entered PC for statistical analysis using SPSS program version 20.

The analysis of anterior chamber angle using gonioscopy and IOP before and after mydriatic test revealed significant increase in IOP after mydriasis also there was significant decrease in AC Angle with gonioscopy after mydriasis.

This study showed that gonioscopy is an effective tool in screening for narrow angled patients. Also, it revealed that mydriatic test is a valuable provocative test as it predisposes to angle narrowing in angle closure suspects.

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