

# Study of pachymetry and iridocorneal angle in patients with chronic glaucoma: About 111 cases at the niamey national hospital in niger.

Abba Kaka HY<sup>1\*</sup>, Amoumoune GS<sup>1</sup>, Nouhou Diiori A<sup>2</sup>, Amza A<sup>2</sup>, Laminou L<sup>3</sup>, Traore H<sup>4</sup>

<sup>1</sup>Department of Ophthalmology, National Hospital of Niamey, Niger, West Africa

<sup>2</sup>Department of Ophthalmology, Lamorde Hospital in Niamey, Niger, West Africa

<sup>3</sup>Department of Ophthalmology, Zinder National Hospital, Niger, West Africa

<sup>4</sup>Department of Ophthalmology, Zinder Regional Hospital, Niger, West Africa

**Received:** 01-Jan-2024, *Manuscript No. AACOVs-24-123104*; **Editor assigned:** 05-Jan-2024, *PreQC No. AACOVs-24-123104 (PQ)*; **Reviewed:** 22-Jan-2024, *QC No. AACOVs-24-123104*; **Revised:** 30-Jan-2024, *Manuscript No. AACOVs-24-123104 (R)*; **Published:** 06-Feb-2024, *DOI: 10.35841/AACOVs.8.1.447-448*

## Abstract

**Introduction:** The aim of our study was to evaluate the central corneal thickness and the iridocorneal angle in glaucoma patients at the Niamey National Hospital.

**Methodology:** This was a prospective descriptive study carried out over 20 months from March 2021 to October 2022 in the ophthalmology department of the Niamey National Hospital.

**Results:** The hospital prevalence was 1.95%, the average age was  $52.48 \pm 16.23$  years (16-84years). M/F sex ratio 1.38. Age over 40 years was the main risk factor (56.08%). The average ECC was  $515.25 \pm 40.38 \mu\text{m}$ . The AIC was completely open in 98.20% of cases. Goniosynechia represented 6.75% of anomalies. The types of glaucoma encountered were as follows: POAG 90%, GSAO 8%, and GCFA 2%.

**Conclusion:** Despite the predominance of POAG, particular attention must be paid to other types of glaucoma. The corneal thinness found in this study calls for early detection strategies for glaucomatous disease.

**Keywords:** Pachymetry, Iridocorneal angle, Glaucomatous, Niger.

**Abbreviations:** ATCD: Past history/Background; AIC: Iridology Corneal Angle; ICA: Irido Corneal Angle; GPAO: Glaucoma Primary Open Angle; GCFA: Glaucoma Chronic Angle Closure; GSAO: Glaucoma Secondary Open Angle; GCAO: Glaucoma Chronic Open-Angle; NOG: Glaucomatous Optic Neuropathy; ECC: Central Corneal Thickness; POAG: Primary Open Angle Glaucoma; GFA: Angle Closure Glaucoma; OHTS: Oculariste Hypertension Treatment Study.

## Introduction

Glaucoma is a progressive optic neuropathy that manifests itself by abnormalities of the optic disc and alterations of the visual field [1]. It is the leading cause of blindness worldwide after cataracts and the second leading cause of irreversible blindness. In Niger, glaucoma represents 22% of the causes of blindness, the prevalence of which was 2.2% [2]. Its clinical and therapeutic diversity makes gonioscopy a crucial step in the clinical examination to deduce the different clinical forms. Fine ECC being considered a risk factor for the development of glaucoma, raises the interest of an evaluation in genetically predisposed melanoderma subjects [3,4].

## Case presentation

This was a prospective, descriptive study carried out over 20 months, from March 2021 to October 2022, at the Ophthalmology department of the Niamey National Hospital. This study concerned all patients followed for chronic glaucoma, regardless of age and sex, in whom gonioscopy and pachymetry were performed. The sampling method was non-

probability, convenience was the technique used. We gradually identified all the patients meeting our inclusion criteria. The responding patients had all benefited from a three-mirror Goldmann glass gonioscopy without pupillary dilation, pachymetry with the Topcon CT-80 optical tonopachymeter.

## Results

During our study period of 11,257 patients, 220 patients were diagnosed with glaucoma, representing a hospital prevalence of 1.95%. One hundred and eleven (111) patients met our study criteria, i.e. 50.45%. The average age of the patients was  $52.48 \pm 16.23$  years with extremes of 16 and 84 years. There was a male predominance of 58%, i.e., an M/F sex ratio of 1.38. A quarter of the patients were retirees (25.22%). Hypertension was the main comorbidity found (27.22%), past history (ATCD) eye surgery was reported by 12.60% of patients, familial glaucoma reported by 12.60% of patients. Age over 40 years was the main risk factor (56.08%) followed by ocular hypertension (33.8%). Glaucoma was discovered following a visual decline in 51.80% of cases and incidentally in 18.70% of cases. The AIC was completely open over  $360^\circ$  in 98.20% of

eyes (Table 1). The anomalies found were predominated by goniosynechia (6.75%), of which 4.95% concerned one to two quadrants of the ICA and 1.80% concerned three to four (Table 2) quadrants of the ICA. Angular hyperpigmentation by deposition of iris pigments was found in 5% of eyes and pigmentation by deposition of pseudoexfoliative material found in 1.80% of eyes. Following the AIC examination, the GPAO represented 90% of the sample, (Table 3) followed by the GSAO 8% and the GCAO 2%. The average ECC was  $515.25 \pm 40.38 \mu\text{m}$  with extremes of  $575 \mu\text{m}$  and  $416 \mu\text{m}$ ; (Table 4) 69% of right eyes and 72% of left eyes had an ECC less than  $520 \mu\text{m}$ .

**Table 1:** Distribution of patients according to the opening of the AIC.

Shaffer classification	Frequency	Percentage (%)
Grade 1	4	1.8
Grade 4	218	98.2
Total	222	100

**Table 2:** Distribution of patients according to angular anomalies.

Angular anomalies	Effective	Percentage (%)
Angular hyperpigmentation	5	4.5
Goniosynechia 1C-2C	8	7.2
Goniosynechia 3C-4C	2	1.8
Pseudo-exfoliative material	3	2.7
Small diameter angular recession	3	2.7
Neovessels	1	0.9
None	89	80.2
Total	111	100

**Table 3:** Distribution of eyes according to type of glaucoma.

Types of glaucoma	Effective	Percentage (%)
GCAO	4	1.8
GSAO	15	6.75
GPAO	200	90.1
Absence of c	3	1.35
Total	222	100

**Table 4:** Distribution of patients according to pachymetry.

ECC ( $\mu\text{m}$ )	Effective	Percentage (%)	Effective	Percentage (%)
>550	14	13	17	15
550-520	28	26	22	20
<520	69	61	72	65
Total	111	100	111	100

## Discussion

The average age was  $52.48 \pm 16.23$  years, with extremes of 16 and 84 years, the age group of 51-84 years was the most represented in 61.20% of cases [5]. It would be higher in studies concerning glaucoma in adults because of the increased risk of the disease with age, so our results were slightly lower than those of Abba Kaka who found an average age of 54 years with extremes practically superimposable ages of 17 and 82 years. This reduction could be in agreement with studies reporting the occurrence of glaucoma increasingly among young active Africans. For Moro.S it was 52 years old. Furthermore, Atipo-Tsiba et al., found an average age of 47.9 years [4]. In this study, age over 40 years was the first risk factor (56%), followed by ocular hypertension (33.8%), these data are variable in the literature and are similar to those of Atipo-Tsiba et al., in Congo who noted age over 40 years as the primary risk factor in 89.9% of cases [4,6].

On gonioscopy, goniosynechia were the most common abnormalities found in 6.75% of cases and would probably be linked to local inflammatory pathologies. Thus Kyari in Nigeria found 8% of secondary [5,7] forms of glaucoma including 19% following uveitis [7]. Furthermore, the bilaterality of goniosynechia in certain patients in this study could be the prerogative of general chronic inflammatory pathologies.

Following the AIC examination, the GCAO represented 90% of our sample followed by the GSAO 8% and the GCAO 2%. Our results were comparable to those of Atipo in Congo which found the prevalence of POAG at 90.6% and GSAO at 5.5% [6]. For Kyari in Nigeria, POAG [5,7] represented 86%, GCAO 14% including 8% secondary form [7]. Several authors had noted the predominance of POAG in melanoderma subjects compared to GSAO, moreover GCAO is confused with POAG and treated as such, hence the interest of gonioscopy in any case of chronic glaucoma.

Average ECC in our study was  $515.25 \mu\text{m}$ , lower than that of the majority of African authors. Lawani and Nomo reported an average ECC of  $549 \mu\text{m}$  and  $536 \mu\text{m}$  respectively [6], moreover, for Koman the ECC was less than  $550 \mu\text{m}$  in 80.58% of cases [8]. The corneal thinness found in this series supports the relationship between ECC and glaucoma reported by the OHTS.

## Conclusion

In this study, goniosynechia were the predominant angular abnormalities, followed by angular hyperpigmentation. A general etiological assessment would be of great benefit given the bilateral nature of these anomalies. The newfound corneal thinness calls for early detection strategies for glaucomatous disease. Thus, it would be wise to ask: What about the ECC of the non-glaucoma subject in our context?

## Conflict of interest

None

## Acknowledgements

Staff of the ophthalmology department of the National Hospital of Niamey, all co-authors for the writing and correction of this article.

## References

1. Moro S, Napo A, Fomba S et al. Epidemiological and clinical aspects of primary open-angle glaucoma in rural areas. *Revue SOAO*. 2019;(01):28-33.
2. Nouhou DA, Abba Kaka HY, Yacoubou S. Contribution of Optical Coherence Tomography (OCT) in Primary Open Angle Glaucoma (POAG) in Niger. *ESJ*. 2022;96-109.
3. Gbe K, Coulibaly F, Ouattara OA, et al. Screening for primary open-angle glaucoma in 506 staff at the Treichville university hospital. *SOAO Review*. 2019;01:53-55.
4. Atipo-Tsiba PW, Dohvoma VA, Eballe A, et al. Epidemiological and clinical aspects of glaucoma at brazzaville university hospital. *Health Sci*. 2017;18(1): 8-10.
5. Kyari F, Gabriel E, Rabiou MM, et al. A population-based survey of the prevalence and types of glaucoma in Nigeria: Results from the Nigeria National Blindness and Visual Impairment Survey. *BCM ophthalmol*. 2015;15(1):176.
6. Lawani R, Ayena KD, Epee E, et al. The distribution of central corneal thickness in beninese patients. *Health Sci*. 2015;16(2):1-4.
7. Nomo AF, Mvogo ESR, Dohvoma VA, et al. Relative afferent pupillary deficiency in primary open angle glaucoma in the middle cameroonian. *Health Sci*. 2021;22(11):81-85.
8. Koman CE, Soumahoro M, Kouassi-RAC, et al. Refractive and pachymetric aspects of primary open-angle glaucoma in African melanoderma: About 260 cases. *Rev SOAO*. 2019;(02):54-59.

### \*Correspondence to

Dr. Abba Kaka Hadjia Yakoura

Department of Ophthalmology

National Hospital of Niamey,

Niger, West Africa

E-mail: [abbakakayakoura.@yahoo.fr](mailto:abbakakayakoura@yahoo.fr)