

Socio-Economic Impacts of Primary Open-Angle Glaucoma in Rural Environment in Mali

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How to cite this paper: Sidibe, M., Napo, A., Dembele, A., Goita, D., Diallo, O., Dembele, D.J., Togo, M.A., Koita, K.B., Coulibaly, A.N., Tounkara, C.F., Toure, N., Konaté, A., Traore, J., N'diaye, F., Traore, L. and Thera, J.P. (2022) Socio-Economic Impacts of Primary Open-Angle Glaucoma in Rural Environment in Mali. *Open Journal of Ophthalmology*, 12, 430-437.

<https://doi.org/10.4236/ojoph.2022.124040>

Received: September 23, 2022

Accepted: November 26, 2022

Published: November 29, 2022

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Abstract

Primary open-angle glaucoma (POAG) is an optic neuropathy that affects the patient's quality of life. The present study aims to write the socio-economic factors influencing the management of glaucomatous patients in rural areas. This was a retrospective, descriptive cross-sectional study, carried out from October 19 to 31, 2017 in a rural town. The variables studied were age, sex, occupation, level of knowledge about the disease and its treatment, average monthly income, accessibility of eye care service, health insurance membership, degree of severity of the disease. The frequency of POAG was 5.68%. The average age of the patients was 52 years old with extremes ranging from 25 to 73 years old; the female sex was the most represented with 19 cases out of 36 or 52.77%. 66.67% of our patients were at their first ophthalmological consultations. Health insurance coverage was 2.78%. The average monthly income was 10,000 to 25,000 FCFA in 58.33%. More than half of our glaucomatous patients, 63.89%, think they are affected by their disease. 80% of patients are unaware that they have eye disease. Many lost vision in one or both eyes and were unaware of the disease affecting their eyes. Accessibility to health services and their costs seem to be a factor, in addition to illiteracy.

Keywords

Glaucoma, Postman, Rural Environment, Socio-Economic

1. Introduction

Primary open-angle glaucoma (POAG) is a progressive, degenerative optic neuropathy characterized by an insidious disappearance of the retinal ganglion cells and their axons which constitute the optic nerve with an open iridocorneal angle associated with an alteration of the visual field [1]. It is the first cause of irreversible blindness in the world whose main risk factor is ocular hypertension [1]. It is a public health problem due to its morbidity and prevalence. In the absence of effective treatment, the evolution takes place naturally and irreversibly towards blindness. This condition poses a double problem, diagnostic and therapeutic, because most patients consult late and few patients have sufficient means to bear the cost of their care, with particular emphasis on those in rural areas. Thus, the resulting blindness leads to socio-economic burden that impacts the life of the patient, his family and society.

Thus, the present study aims to write the socio-economic factors influencing the management of glaucomatous patients in rural areas.

2. Patients and Methods

This was a retrospective, cross-sectional descriptive study. Data were collected from the consultation register and medical records during the free eye screening and care campaign of the Alliance for the Development of Community Ophthalmology (ADOC) of Mali. It was carried out at the Dougourakoro community health center in the Koulikoro region from October 19 to 31, 2017. We carried out systematic screening for the disease in all people who requested the services of the teams providing consultation activities on the site.

All patients underwent a complete ophthalmological examination including visual acuity (VA), slit lamp biomicroscopy, intraocular pressure and fundus examination. Gonioscopy was performed for suspected cases of glaucoma. The POAG diagnostic criteria were made on:

- The association of ocular hypertension greater than 21 mmHg, papillary excavation with a Cup-Disk ratio greater than or equal to 0.5 and an alteration of the visual field (CV); where
- The association of papillary excavation with a Cup-Disk ratio greater than or equal to 0.5 is associated with an alteration of the visual field (VC). The corneal irido angle was open.

A total of 36 glaucomatous patients were included in the study.

The variables studied were age, sex, profession, level of knowledge about the disease and its treatment, average monthly income, accessibility of the ophthalmology service, membership of health insurance, degree of severity of the disease.

We defined:

- Affected by illness: when the sick person cannot go to the mosque or to the church or to the toilet alone, impossibility to drive, impossibility to recognize his environment, to open his door and to have recourse to a third person for

his needs.

- Little affected: when these gestures are performed by the patient with difficulty.
- Unaffected: when the gestures are executed without major constraint.

Data collection was done on individual survey sheets. Data entry and analysis were performed using Epi-Info 7 software.

3. Results

Epidemio-clinical aspects:

During the study period we carried out 634 consultations. Among this number, 36 people presented POAG, a frequency of 5.68%. The average age of the patients was 52 years old with extremes ranging from 25 to 73 years old; the female sex was the most represented with 19 cases out of 36 or 52.77%. Housewives represented 52.78% followed by farmers and workers with 16.67% and 13.89% respectively. Concerning the level of education, 72.22% of our patients had no level of education against 25.00% of primary level and 2.78% of secondary level.

Regarding the use of eye care services, 66.67% of our patients (24/36) were at their first ophthalmological consultation. Only 1 out of 36 patients, or 2.78%, was covered by health insurance (**Table 1**). The average monthly income was (10,000 to 25,000 FCFA) in 58.33% followed by (25,000 to 50,000 FCFA) for 25% and more than (50,000 FCFA) for 16.67%. More than half of our glaucomatous patients, *i.e.* 63.89%, think they are affected by their disease against 36.11% who consider themselves as unaffected (**Table 2**).

Table 1. Breakdown of patients according to membership in health insurance or mutuality.

Health Insurance	Frequency	Percentage
NOPE	35	97.2
YES	1	2.8
Total	36	100.0

Table 2. Distribution of patients according to the impact of the disease on the patient's daily life.

Impact of the disease on the daily life of the patient	Workforce (Patient)	Frequency
Affected	16	44.45%
Little affected	7	19.44%
Unaffected	13	36.11%
Total	36	100.00%

The glaucomatous disease was unknown as well as the therapeutic methods in 80.56% of our patients, *i.e.* 29 patients out of 36. The loss of total vision in monocular vision (negative Light Perception PL– and positive PL+) represented 42 eyes out of 72 *i.e.* 58.34% (Table 3). Bilateral blindness (binocular vision) (negative Light Perception PL– and positive PL+) represented 15 out of 36 patients, *i.e.* 41.67% (Table 4). The cups/disk ratio was rated at 1 in 46 eyes, *i.e.* 63.89% followed by 0.7 (12.5%); 0.8 (12.5%) and 0.9 (8.33%) (Table 5).

4. Discussion

Limitations of the study: retrospective and the sample were small.

4.1. Sociodemographic Characteristic

According to the literature, the prevalence of glaucoma increases with age [2].

Table 3. Distribution of eyes according to AVLsc in monocular vision.

Monocular vision	Workforce (Eyes)	Frequency
PL– to PL+	42	58.33%
1/20 < AV ≤ 3/10	16	22.22%
≥3/10	14	19.45%
Total	72	100.00%

NB: PL– (Absence of light perception); PL+ (Presence of light perception); AV (Visual acuity); AVLsc (Distance visual acuity without correction).

Table 4. Distribution of glaucomatous patients according to AVLSc in ODG binocular vision.

AVLSc ODG	Workforce (patient)	Frequency
PL– to PL+	15	41.67%
1/20 < AV ≤ 3/10	10	27.78%
≥3/10	11	30.56%
Total	36	100.00%

Table 5. Distribution according to the ratio of the cups/disk of the optic papillae.

Cups/Disk report	Workforce (Eyes)	Frequency
0.6	2	2.78%
0.7	9	12.50%
0.8	9	12.50%
0.9	6	8.33%
1.0	46	63.89%
Total	72	100.00%

Our results agree with this statement. Indeed in our series, the prevalence of 11.11% to 27.78% for the respective age groups of 31 to 40 years and 61 to 70 years. The average age of the patients was 52 years old with extremes ranging from 25 to 73 years old, which is similar to that reported by Adio and Onua [3], who had found an average age of 52.7 years. On the other hand, I. Sounouvou *et al.* [4], Packed [5] *et al.* and Kobelt *et al.* [6] found extreme ages higher than ours with respectively 56.3 ± 14.6 years, 62.2 years and 65 years. These observations prove that the average age of onset of POAG varies according to the studies.

4.2. Influence of Knowledge of Glaucoma by Glaucomatous Patients

The knowledge of the disease by the patient is very decisive for rapid management. In our study, 80.56% of patients did not know they had glaucoma. It would probably be linked to the asymptomatic nature and the insidious evolution of the disease where the loss of vision only occurs at the final stage. Other factors could intervene, such as the use of traditional healers and cultural beliefs. This lack of knowledge was studied in Madagascar by Bernadin *et al.* [7] [8] in a descriptive study on the reasons for the late detection of POAG, during which the major difficulties in the detection of glaucoma lay in the ignorance of the disease and its treatment. This finding was confirmed by MOUKOURI E. *et al.* [9] in Cameroon which had found that 96.72% of glaucoma patients, *i.e.* 59 cases out of 61, were unaware of their disease with a fortuitous discovery of glaucoma in 27.54% of patients. He attributes this to the lack of a screening strategy as well as the difficulties of access to hospital structures which mean that most patients consult at a terminal stage of the disease with a significant drop in visual acuity. [9]. In France Bron *et al.* estimate that approximately 400,000 French people are unaware of their disease due to the absence of suggestive functional signs before a late stage [10].

In our study, 72.22% of glaucomatous patients were not schooled. So we think aeducated patient better understands his disease and cooperates in the management of his condition. The more we know, the better we treat ourselves.

4.3. Impact of Socio-Economic Factors on the Management of the Disease in Glaucomatous Patients

One of the factors that can influence or alter the management of the disease is the socio-economic level and affiliation to a health insurance or mutuality. In our study, the majority occupation was housewives followed by farmers and workers with 52.78% respectively; 16.67% and 13.89%. The average monthly income of 58.33% of the patients varied between (10,000 FCFA and 25,000 FCFA) and 97.22% had no health insurance or affiliated with a mutuality, which agrees with data from the Demographic and Health Survey (EDSM-2018-2019) [11] which had found national medical insurance coverage of 3%, with a disparity between rural and urban areas. Indeed, 13% of women in urban areas have taken

out medical insurance against only 3% in rural areas. The same trend is observed among men (14% against 3%) [11]. This problem of subscribing to insurance is a real problem in our countries where the cost of care is borne entirely by patients and their families despite low income. This observation was made by Moukouri E. *et al.* [9] in Cameroon, who found that more than 60% of patients have a low socioeconomic level and are unable to fully support the costs related to the management of their disease (examinations and medication). The same observation was also made by Eballé. HAS [5], still in Cameroon, which had found a low rate of achievement of the visual field linked to the relatively high cost compared to the low socio-economic level of the patients.

I. Sounouvou [4], in Benin, found that the average monthly cost of drug treatment was (11,676 FCFA) or (€17.8) and this cost varied according to the stage of the disease. He found that a glaucomatous patient spends at the time of diagnosis on average (64874.24 FCFA) or (€98.9) in terms of direct costs (consultation, routine examinations, drugs and transport) [4]. In Nigeria, Adio and Onua [3], had found (US\$105.4) expenses incurred by the glaucomatous patient.

We have not studied this aspect related to the cost of drugs, examinations and transport. But by relating the expenses of these studies to the monthly income of our glaucomatous patients and with an SMIG (Guaranteed Interprofessional Minimum Salary) in Mali at (40,000 FCFA) *i.e.* (€60.98) [12], we realize that they cannot face the expenses related to the care of their illness and in addition ensured their daily life. I Sounouvou in Benin had already made this observation [4].

4.4. Accessibility of Eye Care Services

Accessibility to eye care services in our countries poses a real problem in terms of care. Thus, 24 out of 36 patients or 66.67% were at their first ophthalmological consultation. This is consistent with the results of several African authors [13] [14] [15] [16]. This could be explained by the lack of local eye care services, certainly associated with financial inaccessibility given the low income of our populations.

4.5. The Burden of the Disease on the Daily Life of the Patient

The evaluation of binocular visual acuity found a frequency of blindness at 41.67% (PL- to PL+) in our patients, against 30.56% with visual acuity greater than or equal to 3/10. This frequency of blindness shows the seriousness of this sickness. Javitt JC *et al.* [17], found that the prevalence among black subjects was 3 to 4 times higher and had at least 4 times more blindness [15]. This blindness or low vision could have an impact on the daily life of the patient in the absence of adequate support. Thus, we found that 44.44% of our patients think they are affected by their disease. This could lead to a drop in performance or professional productivity because the majority of our patients were housewives with agriculture as their main activity; followed by farmers and workers.

5. Conclusion

POAG is a frequent pathology responsible for blindness and visual impairment in rural areas. This blindness and low vision have significant repercussions on the individual and society in terms of degradation of the quality of life. The ignorance of the disease, the low socio-economic level and the absence of health insurance coverage make the management of this chronic pathology problematic. The decentralization of eye care services, universal health insurance and the organization of free screening campaigns could contribute to reducing the consequences of this scourge.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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