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Prospective Study

### Glaucoma Medical Treatment: Impact on Quality of Life and Patient Compliance

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#### Abstract

**Objective:** To determine the impact of the medical treatment on the quality of life of glaucoma patients.

**Patient and Method:** It was a prospective, transversal and descriptive study on patients with chronic open-angle glaucoma. It took place at the Ophthalmology Service in the teaching hospital of Bouake from January to June 2013, through a 6 month period. Chronic glaucoma patients confirmed by a visual field and who had an open iridocorneal angle of 360 degrees at gonioscopy were included. Furthermore, these patients were under medical treatment for at least 6 months.

**Results:** 24 patients including 14 men (58.33%) and 10 women (41.67%) aged 20-69 years (mean 47 years), 6 (25%) had no activity generating income. Among the remaining 18, 12 (50%) had no health insurance. The treatment was based primarily on monotherapy (54.16%). The Bitherapy was found in 8 patients (33%) and triple therapy in 3 patients (12.50%). As monotherapy or in combination, beta-blockers were the most prescribed. Local side effects were dominated by tingling (54%), pruritus and ocular burning sensation (33.33%). Non ocular side effects have been reported: cough (20.83%) headache (16.66%) and shortness of breath (8.33%). Nine patients (37.5%) believe that the treatment had a negative impact on their daily lives, 6 patients felt the cost of treatment unbearable and almost half, 10 patients (41, 67%) said they had interrupted the treatment at least once for various reasons.

**Conclusion:** The impact of the medical treatment of glaucoma on patients' quality of life can be the cause of poor adherence.

**Keywords:** medical treatment-chronic glaucoma-quality of life-compliance-therapeutic.

#### Introduction

Chronic open angle glaucoma (COAG) or primary open angle glaucoma (POAG) is a chronic and progressive anterior optic neuropathy. It is characterized by a pathological excavation of the optic nerve head and visual field defects that result in deficits perimeter. The disease is associated with damage and destruction of ganglion cell axons [1]. The progressive and irreversible impairment of vision up to blindness is the consequence of this neuronal destruction. As such, glaucoma is the leading cause of irreversible blindness in the world [1]. The etiology of the disease being not well known, the main

goal of treatments available is not to cure, but to prevent visual impairment by fighting against the main risk factor which is ocular hypertension [2]. Drug treatments for glaucoma therefore come to lowering eye pressure and make it less or not harmful to the optic nerve and the visual field. They are based mainly on the single or multi daily instillation of one or more hypotonic eye drops at fixed times. These treatments include, in addition to potential side effects [3, 4], many constraints: they are to be taken for life and involve a series of repetitive and delicate gestures especially for the elderly with comorbidities including osteoarthritis of the hands and fingers. Furthermore, at least initially, where the

lesion is not functionally annoying or crippling, patients must undergo treatment even when they do not feel the need nor the beneficial effects [2]. Quality of life is a complex concept that brings a sense of well-being of an individual as perceived by itself [5]. It can be influenced by the constraints, costs, and side effects of treatment, as well as the disease itself. The inclusion of this concept would limit the negative effects of the disease and its treatment on the patient's daily life [6] and would improve adherence to treatment of chronic diseases [2]. If elsewhere especially in developed countries and in North Africa, several studies have confirmed this hypothesis [7- 9], what about our Ivorian context about glaucoma?

The virtual absence of national data on the influence of medical treatment on the quality of life of glaucoma patients motivated us to conduct this study whose main objective was to determine the impact of medical therapy on quality of life and adherence of patients with COAG in the department of ophthalmology of the teaching hospital of Bouaké.

## Patients and Methods

This is a prospective, transversal and descriptive study on patients with chronic open-angle glaucoma. It took place at the Ophthalmology Service in the teaching hospital of Bouake from January to June 2013, thus a 6 month period. We included in the study, chronic glaucoma patients confirmed by a visual field and who had an open iridocorneal angle of 360 degrees at gonioscopy. Furthermore, these patients were under medical treatment for at least 6 months and had given their verbal agreement to participate in the study. Patients followed in service for another eye disease associated with glaucoma have not been retained as well as those who had not given explicitly their verbal agreement. For selected patients, we raised the sociodemographic characteristics which are age, sex, socioeconomic status, the existence or not of a social insurance (illness or mutual insurance). Then we raised the modalities of treatment ie, mono or combination therapy and type of association. Finally, data on adverse effects and impact on daily life as experienced by patients were collected. We did not use standardized scale for measuring the quality of life [10,11] because after having tested, we found that many items of these scales were inadequate to lifestyle of the majority of our patients. Until such standardized measuring instruments and adapted to our economic and cultural environment are available, we based on the subjectivity of patients by asking a question whose answer had four modalities: "For you, what is the impact of glaucoma treatment on your quality of life?" The four response categories were: 1- No effect 2-Quality of life deteriorated 3- Quality of life improved 4- No rating. Accordingly, the impact on the quality of life could not be quantified.

## Results

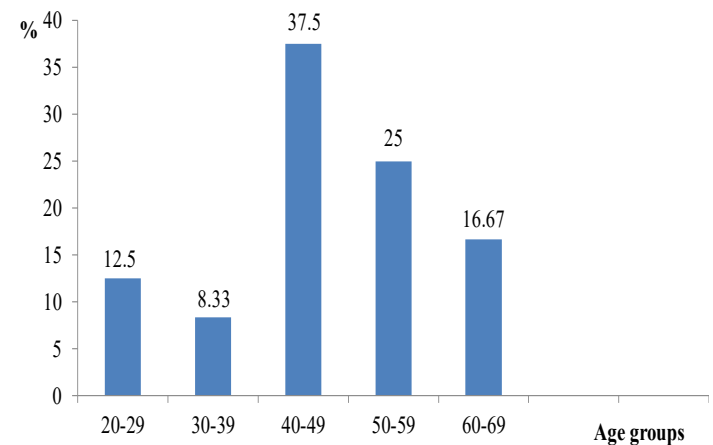
### Sex

The size of our sample was 24 patients, including 14 men (58.33%) and 10 women (41.67%), with a sex ratio of 0.71.

### Age

The age of patients ranged from 20-69 years with an average of 47 years. Nearly 80% of patients were aged 40 and above (Figure 1)

**Figure 1.** Distribution of patients by age



### Socio-economic status and social insurance

Six out of 24 patients (25%) had no activity generating income and 12 (50%) of the 18 who had activities generating income had not signed any health insurance.

### Details of medical treatment and type of combination treatment

The average length of anti-glaucoma treatment was 14.91 months with extremes of 7 and 36 months, a median of 13 months and a standard deviation of 7.183. Over half of the patients were treated with monotherapy (54.16%). The others were treated with bitherapy (33.33%) or triple therapy (12.50%) (Table I). In monotherapy, beta blockers were the most prescribed (76.92%) followed by carbonic anhydrase inhibitors (23.07%). There were no prostaglandin analogs in monotherapy. As for the bitherapy, it has always combined a beta-blocker and a carbonic anhydrase inhibitor (62.5%) or a beta-blocker and a prostaglandin analog (37.5%). Tritherapy has always combined a beta-blocker with a carbonic anhydrase inhibitor and a prostaglandin analog (Table II).

**Table 1.** Modalities of Treatment

	Monothérapie	Bithérapie*	Trithérapie	Total
Effectif	13	8	3	24
%	54.16	33.33	12.50	100

\*same association or not

**Table 2.** Therapeutic families and types of association.

types of association	size	%
<b>Monothérapie : n1=13</b>	BB	76.92
	CAI	23.07
<b>Bithérapie : n2=8</b>	BB+ CAI	62.5
	BB+PA	37.5
<b>Trithérapie : n3=3</b>	BB+CAI+PA	100

Legend: BB = Beta-blocker; CAI = carbonic anhydrase inhibitor; AP = prostaglandin analogue

### Treatment side effects

Local side effects were dominated by the feeling of itchy eyes (54.16%), followed by burning and ocular pruritus (33.33% each). It was also noted non-local side effects such as cough (20.83%), headache (16.66%) and shortness of breath (8.33%) (Table III).

**Table 3.** Types and frequency of side effects of treatment.

side effects	number	%
tingling	13	54.16
burns	8	33.33
dry eye	1	4.16
itching	8	33.33
lacrimation	5	20.83
cephalalgia	4	16.66
breathlessness	2	8.33
Cough	5	20.83
eye pain	2	8.33

### Constraints of treatment and impact of treatment on lives of patients

Nine patients (37.5%) estimated that their treatments have a negative impact on their daily life, 6 patients (25%) found unbearable the cost of treatment and 10 patients (41.67%) said they had stopped their medical treatment at least once for various reasons (forgetfulness, prescribed drugs not available in pharmacies, deliberate decision in the absence of beneficial effects felt etc.).

### Discussion

#### Socio-demographic data

In our study, the predominant age group was that of 40-65 years (79.17%), which is consistent with literature data that indicate that the disease usually affects people over 40 years [12,13]. However, the proportion of younger glaucoma patients (about 20% under 40 years) incites to look for epidemiological features of the disease in our conditions: Is glaucoma appearing earlier in melanoderm subject? The predominance male found (58.33%), almost identical to those found by Ahnoux et al. in 1998 in Abidjan, Côte d'Ivoire (59.4%) [14] and Sounouyou et al between 2007 and 2008 in Cotonou, Benin (57.6%) [15] could be explained by greater accessibility of men to medical care in the African context [15]. This would be a selection bias because sex is not a risk factor for the disease, given the conflicting data of numerous studies on the subject [16]. But this masculine predominance always found, could also be a particular epidemiological profile indicator of the disease related to sex, in the African context in south of the Sahara.

The cost of treatment can be a source of difficulties with certain socio-economically disadvantaged patients, although this is rarely involved in developed countries, due to health insurance systems [17]. In our study, 25% of patients were without income generating activities. Half of the sample (among patients who had income generating activities) wasn't covered by any health insurance. This causes difficulty in meeting the cost of treatment and it's an objective cause of non-adherence [18]. Moreover, in our sample a quarter of patients reported not able to bear the financial cost of their treatments. This would explain the sudden interruption of treatment without medical advice found in 41.67% of patients in our series and abandonment of the treatment observed in 25% in a series of 196 patients carried out by Kosoko et al. whereas 85% of them were aware of the risk of blindness due to glaucoma. [19]. Furthermore, other reasons were mentioned by patients in our series, in addition to the lack of financial means: the breakdown of prescribed drugs in pharmacies in their community or simply a lack of interest in the treatment. All these observations highlight the issue of first-line surgery in the treatment of glaucoma in populations at high risk of blindness in low-income countries [15- 20, 21]. However such an approach would

require careful study of the indications of that surgery.

### Therapeutic diagrams and side effects

The therapeutic diagram is dominated by the prescription of a monotherapy (54.16%) followed by a combination therapy (33.33%) and a triple therapy (12.50%), in comparable proportions to those of Sounouvou and al (respectively 59.4%, 30.8% and 9.8%) [15]. As monotherapy or in associations, the Beta-blockers had a prominent place, probably because of their relatively low costs since the advent of generic [22, 23]. Could this be the “Swiss knife” of the African glaucoma doctors? [24] Adverse effects of treatment recognized by our patients are many and varied. They are similar to the literature data. They report that the side effects of anti-glaucomatous treatment vary from most banal effects (itching, tingling ...) to more severe such as asthma attack triggered by beta-blockers [25, 26]. This suggests that although the COAG is not mortal its treatment can become mortal. Cough and breathlessness reported by some patients recall the need to search through a careful examination, the patient history that can be an absolute or a relative contra-indication against the prescribed molecules.

### Impact on quality of life

More than three quarters of patients felt that their quality of life defined by themselves, deteriorated since the start of their treatment. They blamed the decrease in revenues, the daily stress of treatment, the anxiety of forgetting to instill eye drops and losing his sight not to mention the side effects that are sometimes painful to bear. ROULAND JF also mentioned the additional costs generated by appointments and additional examinations. These factors are an obstacle to proper treatment adherence as underlined in the literature [23]. But the quality of life, as felt, falls within a socio-cultural or economic approach. Indeed, several instruments such as questionnaires Glau-QOL 17, short form of the questionnaire Glau-Qol-36 were designed to measure the quality of life of glaucoma patients. The questionnaire includes 17 items divided into seven dimensions are: daily life, driving (car), anxiety, self-image, the psyche, constraints and support. This is a self-administered questionnaire that the patient completes alone. Furthermore, concerning the “daily life” dimension, there are items related to reading and recreation. And regarding the “behavior” dimension, there are questions such as “do you have difficulties to drive during day time?” [5]. It appears, therefore, in our context with high illiteracy rates where reading is not the most common leisure and where driving is still a luxury reserved for the privileged few, such a measuring instrument would be inappropriate. That’s why we did not use such an instrument but opted for the collection of the impact of treatment such as felt and expressed by patients in their daily life.

### Effects on adherence

Like most cardiovascular and metabolic chronic diseases, adherence of glaucoma patients to medical treatment is a key to success of the management of the disease. [27]. Adherence to treatment has recently given birth to two concepts that are compliance and persistence [28]: compliance is the adequacy of the patient’s behavior to the requirements and recommendations of the physician while persistence is the continuation by the patient of his treatment in the long term [17]. Another fundamental concept in the management of chronic conditions is adherence to treatment. The adherence to medical treatment is the compliance by the patient to therapeutic prescription, dose and duration and this is an essential condition for the effectiveness of any treatment [29]. An adhesion failure is therefore a worsening factor of glaucoma [30]. If compliance puts the patient in a passive role [27], the persistence which represents continued treatment by the patient in the long term, involves a decision-making factor also influenced by the experience of the patient [29]. This is why to improve adherence of glaucoma patients, we must question his perception of the disease and the proposed treatment, his motives and obstacles encountered in the monitoring of treatment. In other words, it is necessary to measure the impact of the disease and its treatment on quality of life. But with which measuring instruments in our context? We must therefore devise measuring instruments more suited to our context, knowing that the implementation of such a project is long and tedious. Moreover, it requires a multidisciplinary collaboration involving doctors, psychologists, sociologists, statisticians etc. [2,31,32].

### Conclusion

Medical treatment of glaucoma is a daily administration of treatment for life. Therefore, it must fully integrate into the glaucoma patient’s habits. This results in a variety of constraints on the patient, especially financial and behavioral. Continued treatment over the long term and adherence to regular monitoring is the only way to hope to stabilize the disease and avoid its inexorable progression to blindness. But how to motivate patients to continue treatment for a usually asymptomatic disease? We must question the impact of this disease and especially its treatment on their quality of life. It is at this price we can improve adherence of glaucoma patients that is deemed poor in general and most often poorly estimated by the doctor. However, such an approach could not be done effectively without measuring instruments adapted to the socio-economic and cultural context of our work environment.

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