Assessment of Adherence in Outpatient Patients with Open-Angle Glaucoma

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ABSTRACT

Glaucoma is chronic, progressive optic nerve neuropathy that leads to permanent defects of visual field. Glaucoma still cannot be cured, however with proper and correct use of prescribed therapy it can be managed in a way to slow its progression and consequent loss of vision. Thus, having good adherence to recommended medications is of utmost importance for glaucoma patients.

We aimed at assessing the degree of adherence to prescribed therapy for open-angle glaucoma in outpatients.

Our one-month research was done at Glaucoma ward of Eye Infirmary at Clinic Center in Nis during February 2019. It was performed in 77 outpatients using anonymous, volunteer-based questionnaire consisting of 11 questions related to demographic and socioeconomic characteristic, disease duration, as well as adherence to recommended therapy and reasons for possible non-adherence.

Out of total outpatient number interviewed, 62.34 % stated that they take their therapy as recommended, and 37.66% stated doing it not so regularly. Among those who are not taking therapy regularly, more were patients of older age (p=0.00001; p<0.05). No difference related to gender was found. Patients on multidrug glaucoma therapy were less adherent than those who use only one drug (p=0.00034; p<0.05). Better adherence was found in patients without comorbidities (87.5%) comparing to those with some concomitant disease (35.14%), there was a statistically relevant correlation between these two parameters (p=0.000002; p<0.005). Most common reasons to non-adherence were adverse drugs effects (100%), very long treatment period (89.66%) and patients' forgetfulness.

Relatively high, but not absolutely adequate degree of adherence is present among open-angle outpatients. Improvement of adherence can be achieved with optimal choice of therapeutic regimen, prescription of drugs with milder adverse effects, patient education about course of disease and its possible consequences i.e. blindness, as well as with emphasizing of importance to follow recommended pharmacotherapeutic measures.

Keywords: adherence, open-angle glaucoma, outpatients

Procena adherencije kod ambulantnih pacijenata sa glaukomom otvorenog ugla

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APSTRAKT

Glaukom je hronična, progresivna neuropatija optičkog živca, koja dovodi do trajnog oštećenja u vidnom polju. Jednom dijagnostikovan glaukom nije moguće izlečiti, ali se pravilnim korišćenjem terapije može sprečiti dalja progresija bolesti i gubitak vida. Uspostavljanje dobre adherence ka farmakoterapijskim preporukama predstavlja jednu od ključnih komponenata u lečenju glaukoma.

Cilj: Ispitati stepen adherence kod vanbolničkih pacijenata sa glaukomom otvorenog ugla

Istraživanje je sprovedeno na odeljenju za glaukom, Očne klinike, Kliničkog centra u Nišu, februara 2019 godine u vidu anonimnog i dobrovoljnog anketiranja bolesnika. Upitnik je popunilo 77 ljudi. Upitnik se sastojao od 11 pitanja koja su se odnosila na demografske i socioekonomske osobine ispitanika, dužinu trajanja bolesti, adherentnost ka preporučenoj terapiji kao i razloge moguće neadherence.

Od ukupnog broja ispitanika, njih 62,34% je navelo da redovno uzima terapiju, dok 37,66% bolesnika nije redovno uzimalo propisane lekove. Među onima koji neredovno uzimaju terapiju više je bilo starijih osoba (p=0,00001; p<0,05), dok razlika u polu nije bila statistički značajna. Pacijenti koji su u terapiji koristili više lekova imali su manju adherentnost u odnosu na one koji su koristili samo jedan lek (p=0,00034; p<0,05). Bolju adherentnost su imali pacijenti bez pridruženih bolesti (87,5%) nego oni sa nekom pridruženom bolešću (35,14%), između ovih parametara postojala je statistički značajna korelacija (p=0,000002; p<0,005). Kao razloge neadherentnosti bolesnici su najčešće navodili neželjene efekte i nelagodnost (100%), dugo korišćenje terapije (89,66%) i zaboravnost (62,01%).

Postoji relativno visok, ali ne potpuno zadovoljavajuć stepen adherence među vanbolničkim pacijentima sa glaukomom otvorenog ugla. Izbor optimalnog terapijskog režima i lekova sa manje neželjenih efekata, edukacija pacijenata o prirodi same bolesti i njenim posledicama tj. mogućem slepilu, kao i naglašavanje značaja redovnog korišćenja terapije moglo bi da dovede do poboljšanja stepena adherence.

Ključne reči: adherenca; glaukom otvorenog ugla; vanbolnički pacijenti

Introduction

Glaucoma is a chronic, progressive neuropathy of the optic nerve, leading to changes in the optic nerve and damage to the visual field. Glaucoma is a multifactorial disease, where elevated intraocular pressure (IOP) is a key factor in its development and the only one that can currently be addressed through medication [1]. This is a disease with a growing global prevalence, affecting approximately 60 million people worldwide, of whom 4 million are blind. The estimated number of affected individuals in Serbia is around 100,000 [2]. It currently ranks as the second leading cause of blindness worldwide but is the leading cause of preventable blindness. Once diagnosed, glaucoma cannot be cured, but proper therapy can prevent further progression of the disease and vision loss.

Adherence represents the extent to which a patient's behavior aligns with the prescribed recommendations of the prescribing authority. Establishing good patient adherence is a constant challenge but is considered a key component of therapy. Several studies have shown that achieving good patient adherence is more likely if the patient has a good understanding of their disease, recognizes the importance of therapy, and if the treatment regimen is straightforward [3]. Additionally, the use of eye drops in glaucoma treatment further complicates the proper use of therapy and reduces adherence in these patients [4].

The aim of this scientific study is to examine the level of adherence among outpatient patients with open-angle glaucoma.

Participants and methods

The study was conducted at the Glaucoma Department of the Eye Clinic, Clinical Center in Niš, in February 2019, through anonymous and voluntary patient surveys. A total of 77 individuals completed the questionnaire. The questionnaire consisted of 11 questions related to the demographic and socioeconomic characteristics of the participants, the duration of the disease, adherence to the prescribed therapy, and reasons for possible non-adherence. Multiple sources were used to compose the questionnaire, and some questions were specifically designed for this research. The survey was conducted in collaboration with the staff of the Eye Clinic, Clinical Center in Niš.

The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Ethics Committee of the Clinical Center Niš, Niš, Serbia (no. 16368/112; approval date: 12 June 2012).

All analyses were performed using the online free calculator Social Science Statistics. Values for continuous variables were presented as the mean with standard deviation, while the frequency was used for categorical variables. Parametric (Student's t-test) and non-parametric (χ^2-test) correlation tests were used to assess the correlations between variables. Statistical significance was determined at the level of $p < 0.05$.

Results

The percentage of adherence in patients with glaucoma is presented in Figure 1. The percentage of patients who regularly used therapy was 62.34%, while the percentage of those who did not regularly use the prescribed therapy was 37.66%.

Figure 1: Percentage of patients who regularly use therapy

The distribution of participants by gender did not show a statistically significant difference between male and female genders, although the number of female participants was higher (46 males, 31 females). The average age of the participants was 62.7 ± 12.73 years. Ten patients (12.99%)

completed primary school, 41 patients (53.25%) completed high school, and 26 patients (33.77%) had higher education. The correlation between demographic and socioeconomic characteristics and the degree of adherence is shown in Table 1. We proved that there is no statistically significant correlation between gender and the degree of adherence (p=0.32; p<0.05). The average age of participants who regularly used therapy was 57.4 ± 12.29 years, while the average age of participants who did not regularly take therapy was 71.4 ± 7.52 years. There is a statistically significant correlation between the average age and the degree of adherence (p=0.00001; p<0.05), as well as between the level of education and the degree of adherence (p=0.00012; p<0.05).

Tabela 1: Correlation between demographic and socioeconomic characteristics and degree of adherence

	Sex male/female N (%)	Average age (years)	Education ps/hs/he N (%)
Use therapy regularly	26/21 (56.52/67.74)	57.4±12.29	2/24/22 (20/58.54/84.62)
Use therapy irregularly	20/10 (43.48/32.26)	71.4±7.52	8/17/4 (80/41.46/15.38)
	p=0,32; p<0,05	p=0,00001; p<0,05	p=00012, p<0,05

ps – primary school, hs – high school, he – high education

We also showed that there is a statistically significant correlation between regular follow-up visits and regular medication intake (p=0.01; p<0.05). All patients who regularly took medication also reported regularly attending follow-up examinations.

Figure 2 shows the reasons for patient non-adherence. The largest number of non-adherent patients cited discomfort and unwanted effects during therapy (100%) as the reason for their non-adherence, followed by the long duration of therapy (89.66%) and forgetfulness (62.01%). Just over half of the patients mentioned using therapy only when they experienced symptoms (58.62%), while about half stated not understanding how long they should use the therapy (51.72%). Patients less frequently mentioned not understanding how to use therapy (44.83%), thinking that the therapy would not help them (44.83%), not believing that regular use of therapy is important (27.59%), not considering glaucoma a serious disease (24.14%), and not having anyone to help them with the application of therapy (24.14%). The least common reason mentioned by respondents was thinking that the therapy did more harm than good (3.45%).
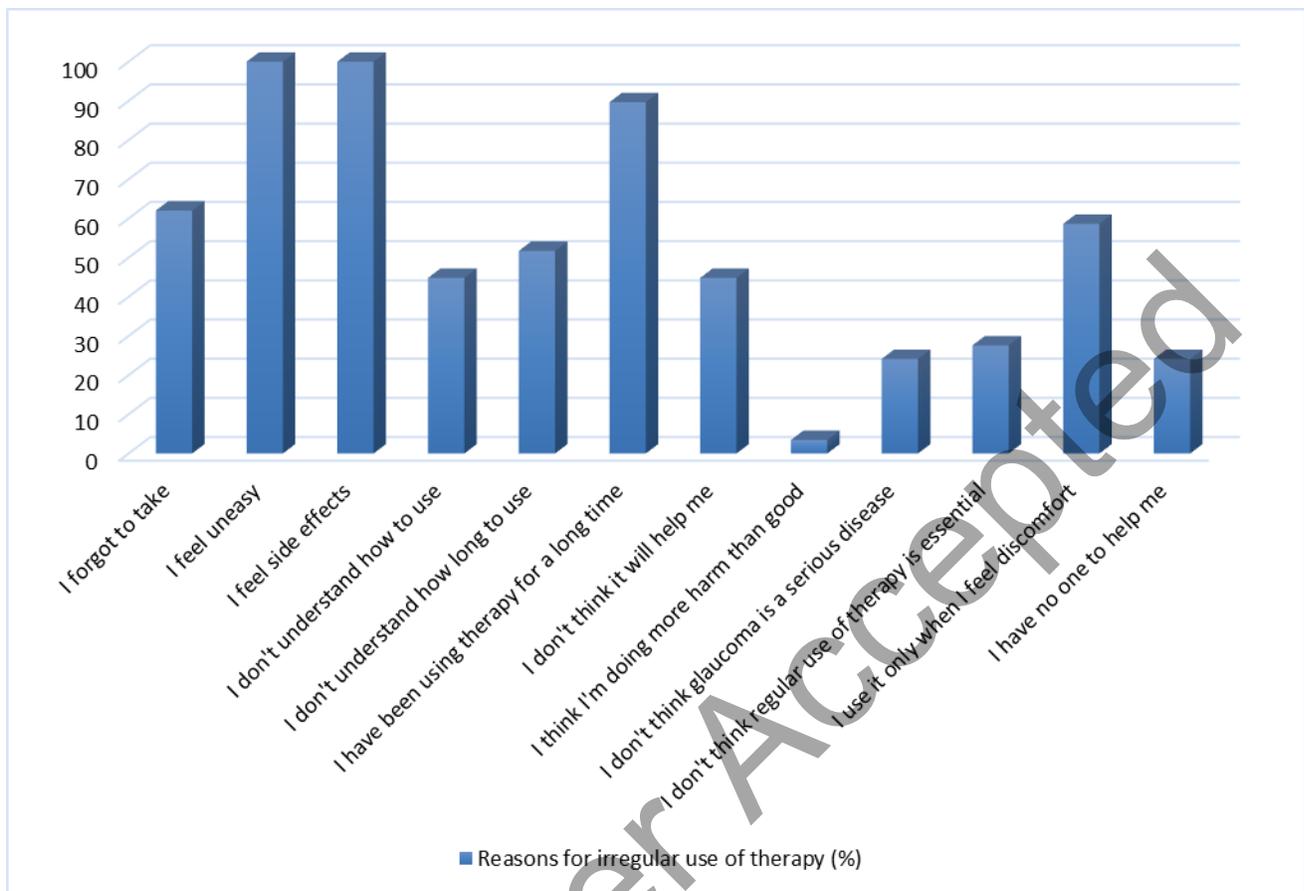
Figure 2: Reasons for irregular use of therapy (%)

Table 2 shows the correlation between the duration of the disease and the degree of adherence. The average duration of the disease in participants who regularly took therapy was 6.71 ± 3.63 years, while the average duration of the disease in participants who did not regularly take therapy was 10.97 ± 4.54 years. There was a statistically significant correlation between the duration of the disease and the degree of adherence (p=0.000014; p<0.05).

Tabela 2: Correlation between the duration of the disease and the degree of adherence

	Average duration of disease in years
Regularly usage of the treatment	6,71±3,63
Irregularly usage of the treatment	10,97±4,54
p=0,000014; p<0,05	

Table 3 presents the correlation between associated diseases and the degree of adherence. Patients with associated diseases, whether ophthalmological or systemic, had a significantly lower degree of adherence (35.14%) compared to patients without associated diseases (87.5%). There was a statistically significant correlation between these two parameters (p=0.000002; p<0.005).

Tabela 3: Correlation between comorbidities and degree of adherence

	With associated diseases N (%)	Withouth associated diseases N (%)
Regularly usage of the treatment	13 (35,14)	35 (87,5)
Irregularly usage of the treatment	24 (64,86)	5 (12,5)
p=0,000002; p<0,005		

Table 4 displays the correlation between the number of medications used in therapy and the degree of adherence. Patients who used 3 or 4 drugs in therapy had a significantly lower degree of adherence (3 drugs – 42.86%, 4 drugs – 30.77%) compared to patients who used 1 or 2 drugs in therapy (1 drug – 81.81%, 2 drugs – 88%). There is a statistically significant correlation between the number of drugs used in therapy and adherence (p=0.00034; p<0.05).

Tabela 4: Correlation between the number of drugs used in therapy and the degree of adherence

	1 drug N (%)	2 drugs N (%)	3 drugs N (%)	4 drugs N (%)
Regularly usage of the treatment	9 (81,81)	22 (88)	12(42,86)	4(30,77)
Irregularly usage of the treatment	2(18,19%)	3(12%)	16(57.14)	9(69.23)
p=0,00034; p<0,05				

Discussion

Patient non-adherence continues to be a significant problem in the treatment of open-angle glaucoma, despite advancements in finding medications and therapeutic regimens that are easier to follow with fewer side effects. The percentage of non-adherent patients in our study was 37.66%. Various studies have shown different rates of non-adherence, with most ranging from 23% [5] to 27.3% [6]. A study conducted in the United Kingdom revealed that 77% of respondents claimed to regularly and correctly take their medication, but only 55% of them could accurately state the names of the drugs they use

and the exact regimen, indicating that a certain number of patients overestimate their discipline [5]. Glaucoma belongs to a group of diseases that often progress asymptomatically until late stages, significantly influencing patient non-adherence, as confirmed in numerous studies [4]. Due to the lack of symptoms, patients often do not grasp the importance of adherence and regular medication intake. From a medical standpoint, treatment effectiveness is evaluated based on the reduction of intraocular pressure, visual acuity, and structural and functional changes. On the other hand, patients must be aware that it is necessary to undergo treatment, even if they do not feel immediate relief. The assessment of treatment effectiveness, from the patient's perspective, is better in symptomatic diseases [7].

Glaucoma is a disease of older age, with prevalence increasing with age. The prevalence of glaucoma in the population over 50 years is 3%, and in those over 70 years, it rises to 5%, with the highest number of cases occurring between 65 and 75 years of age [7]. The average age of our participants was 62.7 years. We demonstrated that the average age of patients who irregularly take medication is significantly higher (71.4 years) compared to the average age of patients who consistently use medication (57.4 years). Older individuals face more difficulties in using medication, including challenges in understanding how and for how long they should use the therapy, memory issues, and, particularly, the use of eye drops [6]. Good coordination, dexterity, and good vision are necessary for independently applying eye drops, and these factors are often diminished in older individuals, requiring assistance in administering the therapy [8]. Studies by Winfield and colleagues and Schwartz and colleagues have shown that around half of older patients experience technical difficulties when applying eye drops, such as aiming, squeezing the bottle, or blinking. The support patients receive from their families has a significant impact on consistency and persistence in therapy application [9]. It is crucial for doctors to understand the importance of involving the patient's family in the treatment process, especially for asymptomatic diseases like glaucoma.

The challenge of establishing good adherence becomes more complex when considering other medications patients take for associated systemic diseases. Different medications with varying methods of application make it challenging for patients to use therapy correctly and regularly [4].

A significant number of our patients, especially the elderly, take medications for diabetes, arterial hypertension, asthma, and other diseases regularly. We demonstrated in our study that the presence of concomitant diseases, whether ophthalmological or systemic, significantly reduces patient

adherence. The adherence of patients without other diseases except glaucoma was 87.5%, while the adherence of patients with associated diseases was only 35.14%. There is a clear statistically significant correlation between the presence of associated diseases and reduced patient adherence.

To achieve better adherence, it is essential for the doctor to consider the patient's daily habits and obligations when creating a daily medication schedule. It is also desirable to associate the medication intake time with some daily activity to avoid forgetfulness as a significant reason for non-adherence [10]. Studies have shown that monotherapy and once-daily dosing are associated with greater consistency and persistence in medication intake. If combined therapy is necessary, it is better to choose a fixed combination, as it simplifies the dosing regimen, leading to better adherence and satisfactory treatment effectiveness [11]. Adding another medication to the treatment regimen significantly decreases patient adherence, as shown in the study by Robin and colleagues [12]. Similar results were obtained in our study, where we demonstrated that the use of a higher number of medications leads to reduced patient adherence. The percentage of non-adherent patients among those using three drugs was 57.14%, and among those using four drugs, it was as high as 69.23%, significantly higher compared to the percentage of non-adherent patients among those using only one drug, which was 18.19%.

We demonstrated in our study that the level of education also influences the degree of adherence. Individuals with lower educational levels are often of lower socioeconomic status, limiting them to using medications covered by the National Health Insurance Fund. These patients frequently cannot afford medications without preservatives (e.g., Benzalkonium Chloride - BAK) due to financial constraints, and they have a significantly lower incidence of side effects. The most common side effects occur as a result of anterior surface eye diseases (chronic inflammation of the eyelid margins, dry eyes, chronic hyperemia, allergic reactions to preservatives in the medication) [13]. These side effects were the main reason for patient non-adherence in our study, where all patients (100%) listed discomfort, itching, stinging, and redness as reasons for non-adherence. Many studies conducted worldwide have not found a connection between patient adherence and medication side effects [14, 15]. The disparity between our results and theirs likely lies in the different socioeconomic profiles of patients. It is necessary in clinical practice to distinguish between side effects that genuinely require discontinuation of therapy and symptoms of a highly subjective nature not accompanied by objective

symptomatology. In any case, patients must be fully informed about the nature of their disease and potential outcomes if they discontinue treatment spontaneously.

Konstans and colleagues showed in their study that one of the key factors in achieving good adherence is the patient's good understanding of the nature of the disease. Consequently, establishing a good relationship and trust between the doctor and patient, as well as regular check-ups, are essential factors in glaucoma treatment and preventing disease progression [10]. Friedman and colleagues, in the GAPS study [16], demonstrated that regular check-ups are significantly associated with better patient adherence. Similar results were obtained in our study, where we showed a statistically significant correlation between regular attendance of follow-up examinations and regular medication intake.

Conclusion

There is a relatively high, but not entirely satisfactory, level of adherence among outpatient patients with open-angle glaucoma. Optimal therapeutic regimens and medications with fewer side effects, patient education about the nature of the disease and its potential consequences, such as possible blindness, as well as emphasizing the importance of regular medication intake, could lead to an improvement in adherence levels.

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