PATIENT COMPLIANCE TO GLAUCOMA THERAPEUTICS: A PORTUGUESE OVERVIEW

Adesão do paciente à terapêutica do glaucoma: uma visão geral portuguesa

Adhesión del paciente con la terapéutica del glaucoma: una visión general de Portugal

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ABSTRACT

Framework: glaucoma is one of the main causes for irreversible blindness. Proper treatment requires high levels of compliance to therapeutics. Most glaucoma patients do not comply with their treatment and that has been correlated with glaucoma progression. **Aim:** to evaluate patient's compliance to glaucoma therapeutics. **Methodology**: an observational, cross-sectional and descriptive study was developed. Outpatients with glaucoma were enrolled and screened before follow-up medical appointment with an observational grid while applying antiglaucomatous drugs. After the treatment, patients were interviewed to understand their skills and difficulties in performing glaucoma treatment. **Results**: from 51 outpatients enrolled, 39% of them did not know the medication's name used; 59% did not perform hand washing prior to the procedure; 73% leaned the vial tip contacting the eye; 25% did not apply the medication to the conjunctival sac; in 63% of the subjects used more than one drop; the majority of patients, 57%, did not wait the appropriate time between applications when two or more drugs were prescribed. **Conclusion**: the results suggest the need to implement individual or group strategies that enable patients with glaucoma to correctly perform their treatment.

Keywords: patient compliance; therapeutics; glaucoma; nursing

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RESUMO

Enquadramento: o glaucoma é uma das principais causas de cegueira irreversível. O tratamento adequado requer elevados níveis de adesão ao regime terapêutico. A maioria dos doentes com glaucoma não cumpre a terapêutica antiglaucomatosa o que está correlacionado com a progressão da doença. **Objetivo:** avaliar a adesão da pessoa à terapêutica antiglaucomatosa. **Metodologia:** foi desenvolvido um estudo observacional, transversal e descritivo. Foram incluídos e selecionados para este estudo doentes com glaucoma em tratamento ambulatório que, antes da consulta médica, foram avaliados durante a aplicação de drogas antiglaucomatosas, utilizando uma grelha de observação. Após o tratamento, foram entrevistados para perceber as suas habilidades e dificuldades na realização do tratamento. **Resultados:** da amostra obtida de 51 doentes, 39% desconheciam o nome do medicamento utilizado; 59% não realizaram a lavagem das mãos antes do procedimento; 73% inclinou o frasco colocando-o em contato com o olho; 25% não aplicavam a medicação no saco conjuntival; em 63% dos sujeitos verificou-se que utilizaram mais de uma gota; a maioria dos doentes, 57%, não esperou o tempo adequado entre as aplicações quando dois ou mais medicamentos foram prescritos. **Conclusão:** os resultados sugerem a necessidade de implementar estratégias individuais ou de grupo que possibilitem à pessoa com glaucoma realizar corretamente o tratamento.

Palavras-chave: adesão ao tratamento; terapêutica; glaucoma; enfermagem

RESUMEN

Encuadramiento: el glaucoma es una de las principales causas de ceguera irreversible. El tratamiento adecuado requiere altos niveles de adhesión a la terapia. La mayoría de los pacientes con glaucoma no cumplen su tratamiento lo que se correlacionó con la progresión del glaucoma. **Objetivo:** evaluar la adhesión del paciente a la terapéutica del glaucoma. **Metodología:** se ha desarrollado un estudio observacional, transversal y descriptivo. Fueron incluidos y seleccionados pacientes con glaucoma en tratamiento ambulatorio, que antes de la consulta médica, se evaluaron utilizando una rejilla de observación durante la aplicación de drogas antiglaucomatosas. Después del tratamiento, los pacientes fueron entrevistados para percibir sus habilidades y dificultades en la realización del tratamiento del glaucoma. **Resultados:** de la muestras 51 pacientes , el 39% desconocía el nombre del medicamento utilizado; 59% no realizaron el lavado de las manos antes del procedimiento; el 73% inclinó el frasco colocándolo en contacto con el ojo; el 25% no aplicaba la medicación en el saco conjuntival; en el 63% de los sujetos, se verificó que utilizaron más de una gota; la mayoría de los pacientes, el 57%, no esperó el tiempo adecuado entre las aplicaciones cuando se prescribieron dos o más medicamentos. **Conclusión:** los resultados sugieren la necesidad de implementar estrategias individuales o de grupo que posibiliten la persona con glaucoma realizar correctamente el tratamiento.

Palabras clave: adhesión al tratamiento; terapéutica; glaucoma; enfermería

INTRODUTION

Compliance to therapeutics has a key role to improve quality of life for patients with chronic disease and in glaucoma patients it is known to be poor. There are no available data concerning patient's compliance to eye drop treatment amongst Portuguese glaucoma patients. This has been identified has a problem and it is the focus of this research. With the aim of determining glaucoma patient's compliance to treatment, an observational, cross-sectional and descriptive study was developed in a Portuguese public hospital. The knowledge about compliance to the therapeutic regimen and the identification of possible barriers or constraints will allow nurses to intervene in this area, providing personalized care, more responsive to the real needs of these patients.

BACKGROUND / THEORETICAL FRAMEWORK

Glaucoma is one of the main causes for irreversible blindness in the world (Quigley & Broman, 2006; Weinreb, Aung & Medeiros, 2014; World Health Organization, 2012), caused by optic neuropathies characterized by retinal ganglion cells progressive degeneration (Weinreb, Aung & Medeiros, 2014). In Portugal, more than 200.000 people have intraocular hypertension and, of those, one third suffers from glaucoma. Around 6.000 patients can evolve to irreversible blindness or marked vision degradation (Direção-Geral da Saúde, 2016) and 2.2% (231,634 inhabitants) of Portuguese population are under some type of eye drop treatment (Sousa et al., 2017).

Glaucoma treatment includes medical treatment, laser therapy and surgery, or their combination (Boland et al., 2013). Medical treatment with hypotensive drops is the most frequently used approach, with effective results in decreasing intraocular pressure (Weinreb et al., 2014) and the first choice in Portuguese guidelines for glaucoma therapeutics (Direção-Geral da Saúde, 2014).

However, proper treatment requires high levels of compliance to therapeutics (Prum Jr. et al., 2016). Compliance to medical treatment is poor, having up to 80% of glaucoma patients that do not comply with their medication regimen (Olthoff, Schouten, Van de Borne & Webers, 2005). This has been shown to be correlated with glaucoma progression (Sleath et al., 2011), and should be a main concern to health professionals. Four groups of presumed determinants were identified for noncompliance in glaucoma patients: demographic and sociographic variables; knowledge, attitude, and health behavior–related variables; aspects of the disease; and aspects of the treatment (Olthoff, Schouten, Van de Borne & Webers, 2005). Health professionals must target their interventions to enhance compliance of patients in whom they expect clinically relevant noncompliance, focusing on patient knowledge and understanding of glaucoma, patient forgetfulness, and reduction of the dose frequency (Olthoff, Schouten, Van de Borne & Webers, 2005). .

METHODOLOGY

For this observational, cross-sectional and descriptive study, 51 adult patients diagnosed with glaucoma and ocular hypotensive treatment were enrolled, after informed consent, from both genders, treated as outpatients, in an ophthalmology department of a major public hospital. All data collection and

treatment had prior approval by the hospital's ethic commission.

Data collection was carried between April and May of 2017, through structured observation and systematic description of behaviours and events that concern the research problem. At the hospital where this study was conducted, there is no structured educational program for glaucoma patients. Study's Inclusion criteria were: 1) outpatients at the hospital's ophthalmology clinic, 2) cognitive and mental abilities to respond to the posed questions and to autonomously perform eye drop treatment, 3) to be an adult, and 4) informed consent to participate in the study. An observation grid was constructed by the authors, according to good practice standards and literature review, to allow data collection and analysis, namely behavioural data regarding the steps necessary to correctly perform the eye drop applying technique (Ministério da Saúde, 2011). Patients were asked to demonstrate how they normally apply ocular medication using a sterile artificial tear flask. During that, researchers observed and registered if the procedure was performed correctly, with the observational grid, according to the following items: 1) hand washing before procedure 2) head positioning 3) contact between the eye and the vial 4) eye location for drop application (conjunctival sac or elsewhere) 5) number of drops by application and 6) hand washing after the procedure. After therapeutics procedure, patients were interviewed, through a structured interview, to understand their skills and difficulties in performing glaucoma treatment, with three questions: 1) medication's name, 2) medication's schedule and 3) time between applications if two or more eye drops were prescribed.

The sample was accidental non-probabilistic, since the data collection was performed on a population of patients who had scheduled glaucoma follow-up appointments and met the inclusion criteria. During time foreseen for data collection, a total of 51 patients was recruited. All the data were collected by a single researcher with differentiated training for this purpose. All ethical procedures have been complied with during data collection. Data were treated through descriptive statistics through the SPSS Version 24.

RESULTS

The sample comprised 51 patients, with 27 females and 24 males, with an average age of 73.4 (SD 10.5) and 73.7 yrs (SD 10.6) respectively, basic schooling (4^{th} and 12^{th} degree). Regarding the data collected from the observational grid, results show that most patients, 59% of the sample, did not wash their hands prior to the procedure. With respect to neck hyperextension, patients are fully aware of the importance of the head positioning (90%) for the correct eye drop application. During the drug instillation, it was found that 73% of patients lean the vial contacting with the eye. 25% of the patients did not apply the drop to the conjunctival sac, which means that the medication was not fully instilled. It should be noted that during the procedure these patients do not have the perception that eye drop application is not being correctly performed. Since the correct use is a single eye drop, in 63% of the subjects it was verified that they used more than one

drop. It was also observed that 98% of patients do not wash their hands after procedure. A majority of 57% patients did not wait for the appropriate time for effective treatment in case of prescription of two or more drugs.

Results from the structured interview show that 39% of the subjects did not know the name of the drug used, which may cause some difficulty in the treatment and recognition of the disease. Regarding the schedule of the application of the medication by the patient, it was verified that 96% of them are in compliance with the prescribed schedule. In our study, only 4% of the patients did not know the time for medication application.

DISCUSSION

The results obtained suggest that it is necessary to improve compliance in glaucoma patients treated with ocular hypotensive therapeutics. This study reinforces previous findings from other studies that evaluated compliance in glaucoma patients (Muir & Lee, 2011; Vaidergorn et al., 2003). Intraocular pressure control depends greatly on the strict compliance with eye drop treatment, not only in terms of periodicity, but also with respect to compliance with the rules for the eye drop application (Robin & Grover, 2011).

Regarding knowledge about prescription, 39% of patients did not know the medication's name and only 4% did not know the application schedule, which is in agreement with evidenced results (Tatham, Sarodia, Gatrad & Awan, 2013). One of the aspects to consider is the issue of hand hygiene before and after procedures as a way to prevent contamination of the bottles and infection's transmission (Ministério da Saúde, 2011). In this case, patients should be informed so that they are trained and adopt more appropriate measures. This procedure is important to avoid contamination of other vials, surfaces, or disease transmission to other people. In eye drop application technique, a detail such as the neck hyperextension is an important strategy for the procedure's success which, according to the standard, facilitates its execution (Ministério da Saúde, 2011). 10% of patients do not perform hyperextension, so educational strategies must be taken to enhance patients understanding of the importance of positioning to optimize the eye drop application. 73% of patients touch the vial tip to the eye surface, and it should be noted that some patients have rubbed the vial tip with some pressure on the ocular surface, which can lead to trauma and contamination (Tatham et al., 2013). Improper administration technique can compromise health care outcomes since it does not allow to fully achieve expected results with treatment. Recent studies have shown that improper eye drop administration technique can lead to bottle tip contamination (Kholdebarin, Campbell, Jin & Buys, 2008; Tatham et al., 2013). The eye drop application to the conjunctival sac (25% did not do so) is essential so that medication is correctly absorbed and effective treatment is assured. Regarding the amount of drops used for each application, it should be noted that 63% of patients applies more than one drop, with waste, which for several reasons, is a factor to be taken into account in patient's education, alerting that excessive quantity does not yield more effective results, and increases the cost. It is noteworthy that several patients literally squeeze the bottle without having the least notion of the amount of drops they apply,

stopping only when they feel the medication trickling on the face. Finally, 57% of patients do not wait 5 minutes between different applications of eye drops in the same eye, which may reduce the efficacy of the medication administered and its consequent effect.

Patient education on the eye drop application technique is associated with increased patient's ability to correctly administer therapy. There is evidence that educational programs targeting glaucoma patients are effective (Newman-Casey, Dayno & Robin, 2016), not only to save costs related to over consumption of medication, but mainly by improving the quality of life of patients by obtaining better results in the control of intraocular pressure and consequently restrain the progression of the disease. Patient compliance is extremely important for effective and successful treatment. Additionally, maximizing patient adherence has a societal benefit (Osterberg & Blaschke, 2005). Poor adherence to medication has been shown to increase healthcare costs in the United States. According to Osterberg & Blaschke (2005), of all medication related hospital admissions in the US, 33-69% are due to poor medication adherence, with a resultant cost of around $100 billion a year.

It must be highlighted that even patients with previous experience in the administration of this type of medication continue to have difficulties in administering the medication (Slota et al., 2015). Thus, the observational grid used in this study can be useful to evaluate the needs of each patient and serve as a way to evaluate educational intervention outcomes over time. It has been referred the importance of correct use of the prescribed medication, not only in the use of eye drop at the recommended times, but also the correct application technique (Vaidergorn et al., 2003). The authors emphasize that it is extremely important that therapeutic compliance is effective, not only for its impact on the patient's quality of life, but also for the monetary costs that treatment entails. In a previous study, more than 50% of patients did not demonstrate compliance or adequate administration technique, emphasizing that patients with glaucoma should be educated about the importance of compliance and educated about the proper eye drop administration technique (Tatham et al., 2013). It has been targeting a better compliance that education programs have been implemented in many places, in order to avoid the disease progression (Leitão et al., 2010). The interventions that successfully improved glaucoma medication compliance used an adequate face-to-face counselling to overcome barriers to health behaviour change alongside with education about glaucoma (Newman-Casey et al., 2016).

This study's results, although its time and sample limitations, suggests that professional behaviour adjustments towards patients' needs are essential.

CONCLUSION

The results of this study provide new information targeting the need to promote educational programs for glaucoma patients, aiming to improve treatment compliance and health related outcomes. The methodology used allowed the identification of factors that could hardly be reached through other strategies of data collection. Participant observation suggests to be an adequate tool to deepen the phenomenon under study. Nevertheless, given the hospital's dynamics, it would be important to develop simpler tools that require less time and resources for

continuous monitoring of educational programs and thus achieve the goal to have educated patients. The study has limitations. The single location for data collection has limited the sample and the fact that researchers had not access to the information about the patient's length of treatment is the main limitations. Further studies should be conducted, with larger samples, increasing the data on patient compliance in glaucoma treatment, allowing more robust results for the design of educational programs. Action research must be undertaken to validate the results of educational programs, targeting glaucoma patient's compliance.

REFERENCES

Boland, M. V., Ervin, A. M., Friedman, D. S., Jampel, H.D., Hawkins, B. S., Vollenweider, D.,… Robinson, K.A. (2013). *Comparative effectiveness of treatments for open-angle glaucoma: a systematic review for the U.S. preventive services task force*. Ann Intern Med., 158, 271-9. doi: 10.7326/0003-4819-158-4-201302190-00008.

Direção-Geral da Saúde (2014). *Abordagem terapêutica farmacológica do glaucoma primário de ângulo aberto/hipertensão ocular*. Lisboa: Direção-Geral da Saúde.

Direção-Geral da Saúde (2016). *Programa Nacional para a Saúde da Visão: Revisão e Extensão 2020*. Lisboa: Direção-Geral da Saúde.

Kholdebarin, R., Campbell, R. J., Jin, Y. P. & Buys, Y. M. (2008). *Multicenter study of compliance and drop administration in glaucoma.* Can J Ophthalmol., 43 (4), 454-61. doi: 10.1139/i08-076.

Leitão, P., Amaral, A., Pinto, L. A., Ferreira, J., Magriço, A., Trincão, F.,… Reina, M. (2010, Janeiro-Março). *Avaliação do conhecimento sobre a sua doença em doentes com glaucoma seguidos na consulta de especialidade de um hospital central.* Oftalmologia, 34 (1), 295-300.

Ministério da Saúde. Administração Central do Sistema de Saúde IP. (2011). *Manual de Normas de enfermagem: procedimentos técnicos.* Lisboa: Administração Central do Sistema de Saúde IP.

Muir, K. W. & Lee, P. P. (2011). *Glaucoma medication adherence: room for improvement in both performance and measurement.* Arch Ophthalmol., 129 (2), 243-5. doi: 10.1001/archophthalmol.2010.351

Newman-Casey, P. A., Dayno, M. & Robin, A. L. (2016). *Systematic review of educational interventions to improve glaucoma medication adherence: an update in 2015.* Expert Review of Ophthalmology, 11 (1), 5-20. doi: 10.1586/17469899.2016.1134318

Olthoff, C. M., Schouten, J. S., Van de Borne, B. W. & Webers, C. A. (2005). *Noncompliance with ocular hypotensive treatment in patients with glaucoma or ocular hypertension.* Ophthalmology, 112 (6), 953-61. doi: 10.1016/j.ophtha.2004.12.035

Osterberg, L., Blaschke T. (2005). *Adherence to medication.* N Engl J Med., 353 (5), 487-97.

Prum Jr., B. E., Rosenberg, L. F., Gedde, S. J., Mansberger, S. L., Stein, J. D., Moroi, S. E.,… Williams, R. D. (2016). *Primary Open-Angle Glaucoma Preferred Practice Pattern® Guidelines.* Ophthalmology, 123 (1), 41-111. doi: 10.1016/j.ophtha.2015.10.053

Quigley, H. A. & Broman, A. T. (2006). *The number of people with glaucoma worldwide in 2010 and 2020*. British Journal of Ophthalmology, 90 (3), 262-7.

Robin, A. & Grover, D. S. (2011). *Compliance and adherence in glaucoma management.* Indian J Ophthalmol., 59, (Suppl), 93-6. doi: 10.4103/0301-4738.73693

Sleath, B., Blalock, S., Covert, D., Stone, J. L., Skinner, A. C., Muir, K. & Robin, A. L. (2011). *The Relationship between Glaucoma Medication Adherence, Eye Drop Technique, and Visual Field Defect Severity.* Ophthalmology, 118 (12), 2398-402. doi: 10.1016/j.ophtha.2011.05.013

Slota, C., Sayner, R., Vitko, M., Carpenter, D. M., Blalock, S. J., Robin, A. L., Muir, K. W.,… Sleath, B. (2015). *Glaucoma patients expression of medication problems and nonadherence.* Optom Vis Sci., 92 (5), 537-43. doi: 10.1097/OPX.0000000000000574

Sousa, D. C., Leal, I., Nascimento, N., Marques-Neves, C., Tuulonen, A. & Abegão Pinto, L. (2017). *Use of Ocular Hypotensive Medications in Portugal: PEM Study A Cross-sectional Nationwide Analysis*. Journal of Glaucoma., 26 (6), 571–576. doi: 10.1097/IJG.0000000000000668

Tatham, A. J., Sarodia, U., Gatrad, F. & Awan, A. (2013). *Eye drop instillation technique in patients with glaucoma.* Eye, 27 (11), 1293-8. doi: 10.1038/eye.2013.187

Vaidergorn, P. G., Malta, R. F. S., Borges, A. S., Menezes, M. D. R., Trindade, E. S. & Santiago, J. B. N. (2003). *Eye drop instillation technique in chronic glaucoma patients.* Arq. Bras. Oftalmol., 66 (6), 865-9. http://dx.doi.org/10.1590/S0004-27492003000700023

Weinreb, R.N., Aung, T. & Medeiros, F. A. (2014). *The pathophysiology and treatment of glaucoma: a review*. JAMA, 311 (18), 1901-11.

World Health Organization (2012). *Global data on visual impairments 2010*. Geneva: World Health Organization.