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Non-medical direct and indirect costs related to primary open-angle glaucoma in Brazil

Custos não médicos diretos e indiretos relacionados ao glaucoma primário de ângulo aberto no Brasil

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Abstract

Objective: *To identify direct and indirect non-medical costs in a population of patients with primary open-angle glaucoma (POAG) receiving treatment in Brazil.* ***Methods:*** *In this cross-sectional study, we obtained the costs through an interview with a population of patients with POAG at a glaucoma referral clinic in the city of Juiz de Fora - MG. In order to assess the direct non-medical costs, we investigated the following variables transportation expenses, lodging expenses, food and companion expenses for each visit. In the indirect costs analysis, we assessed the following variables: whether or not social benefits were received because of glaucoma (retirement or sickness benefit) and the annual value and loss of days worked by the patient and/or the companion. We calculated the mean annual values for the whole group and for each glaucoma stage.* ***Results:*** *Seventy-seven patients were included in this analysis (initial POAG: 26.0%, moderate POAG: 24.7% and advanced POAG 49.3%). The mean non-medical direct cost was (in reais): 587.47; 660.52 and 708.54 for the initial, moderate and advanced glaucomas, respectively. The mean indirect cost was: 20,156.75 (initial POAG); 26,988.16 (moderate POAG) and 27,263.82 (advanced POAG).* ***Conclusion:*** *We identified the direct and indirect non-medical costs related to POAG in Brazil. Indirect costs are higher than non-medical direct costs and both tend to increase with disease progression.*

Keywords: *Primary open-angle glaucoma/therapy; Costs and costs analysis; Health care costs*

Resumo

Objetivo: Identificar os custos não médicos diretos e indiretos em uma população de pacientes portadores de glaucoma primário de ângulo aberto (GPAA) em tratamento no Brasil. **Métodos:** A pesquisa dos custos neste estudo transversal foi realizada através de entrevista a uma população de pacientes portadores de GPAA em acompanhamento em um centro de referência para o tratamento do glaucoma na cidade de Juiz de Fora - MG. Para avaliação dos custos não médicos diretos, as seguintes variáveis foram investigadas: gasto com transporte, hospedagem, alimentação e acompanhante para cada consulta. Já na análise dos custos indiretos, avaliou-se: recebimento ou não de benefício social por causa do glaucoma (aposentadoria ou auxílio-doença) e qual o valor anual e perda de dias trabalhados pelo paciente e/ou pelo acompanhante. Os valores médios anuais foram calculados para todo o grupo e para cada estágio evolutivo do glaucoma. **Resultados:** Setenta e sete pacientes foram incluídos nesta análise (GPAA inicial: 26,0%; GPAA moderado: 24,7% e GPAA avançado: 49,3%). A média do custo não médico direto foi (em reais): 587,47; 660,52 e 708,54 para os glaucomas iniciais, moderados e avançados, respectivamente. Já a média do custo indireto foi: 20.156,75 (GPAA inicial); 26.988,16 (moderado) e 27.263,82 (avançado). **Conclusão:** Os custos não médicos diretos e indiretos relacionados ao GPAA no Brasil foram identificados. Os custos indiretos são superiores aos custos não médicos diretos e ambos tendem a aumentar com o avanço da doença.

Descritores: Glaucoma primário de ângulo aberto/terapia; Custos e análises de custos; Custos de cuidados de saúde.

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Introduction

Among the different types of glaucoma, primary open-angle glaucoma (POAG) is the most frequent, accounting for approximately 12% of causes of blindness in Brazil and in the world.[1-3] The POAG is the main cause of irreversible blindness in Brazil.[2] It is estimated that in Brazil the population with glaucoma is around 1 million people over 40 years of age.

The prevalence and incidence of POAG increases with age.[4] With the tendency of Brazilian population growth and aging in the coming years, the number of cases of POAG will increase significantly as will its economic impact on patients, health and society as a whole.[5–8]

The knowledge of the costs related to POAG is therefore of fundamental importance for the correct planning and allocation of the scarce resources destined to health.[9]

Health costs can be classified as medical costs and non-medical costs. The medical costs are those directly related to the disease, such as medications, surgeries, hospitalizations, appointments, exams, etc. Non-medical costs can be subdivided into direct and indirect costs. Non-medical direct costs include transportation, food, cost of hospital chaperone, etc. The non-medical indirect costs are related to the loss of productivity and incapacity of the patient or the chaperone.[9–12]

There are already studies in Brazil estimating direct medical costs, but there is no estimate of non-medical costs (direct or indirect) for the reality of the Brazilian population.[9,13–16]

The objective of the present study is to identify the non-medical direct and indirect costs in a population of patients with POAG in Brazil.

Methods

In this cross-sectional study, a population of patients with POAG was followed up at a referral center for the treatment of glaucoma in the city of Juiz de Fora - MG between November 2017 and January 2018. This study is part of a major research project in progress at Universidade Federal de Juiz de Fora, which aims at studying the economic impact of glaucoma in Brazil, having been approved by the Ethics Committee of said institution.

Inclusion criteria were being over 18 years of age, being followed up in the center for at least 1 year, and having POAG. The exclusion criteria included refusal to participate in the study, having another type of glaucoma, inability to respond to the questionnaire.

All consecutive patients who met the inclusion and exclusion criteria were invited to participate in the study and to respond to the questionnaire. In addition to the demographic data, the clinical data collected were the number of ophthalmologic appointments in the previous year and the stage of glaucoma in the best eye. According to the classification by Hodapp, Parrish and Anderson, patients were classified into initial POAG when the MD (mean deviation of Humphrey perimetry, Carl Zeiss Meditec Inc., USA) was > -6.00 dB. Moderate and advanced POAG had MD between -6.00 and -12.00 dB and <-12.00 dB, respectively.(17) The variables related to the cost evaluation were as follows. To evaluate non-medical direct costs, we searched transportation, accomodation, food and chaperone expenses for each appointment. In the analysis of indirect costs, the following variables were evaluated: whether or not social benefits were received because of glaucoma (retirement or sick pay), and the annual value and loss of days worked by the patient and/or chaperone. The average annual values were calculated for the whole group and for each evolutionary stage of glaucoma. The costs (in Reais) are based on the year 2018.

Data was collected in Microsoft Excel (Microsoft Inc., USA) and statistical analysis was carried out in SPSS (IBM Inc., USA).

Results

The study population comprised 77 patients, corresponding to 81% of all patients who met the selection criteria for the study and were invited to participate (95 patients). Eighteen patients refused to participate. The main reason was lack of time to respond to the questionnaire.

The average age ± standard deviation (SD) of the study population was 65.9 ± 14.4 years. The majority of the patients (66.2%) were female. Regarding the evolutionary stage of glaucoma in the best eye, the distribution was as follows: 26.0% of initial POAG; 24.7% of moderate POAG, and 49.3% of advanced POAG.

Among the patients studied, 18.2% reported being retired because of glaucoma, whereas 2.6% were receiving sick pay due to glaucoma. The majority of patients (98.7%) reported the need for chaperone for the medical appointment, and a large part (58.4%) of the interviewees reported loss of their own or the chaperone's workday. The average annual cost per patient was R$ 665.24 for non-medical direct costs, and R$ 25,349.80 for indirect costs.

Table 1 shows the results of non-medical direct and indirect costs for each evolutionary stage of POAG.

Figures 1 and 2 illustrate the total non-medical direct and indirect costs, respectively, for each evolutionary stage of glaucoma.

Table 1
Non-medical direct and indirect costs according to the evolutionary stage of primary open-angle glaucoma in Brazil

	POAG initial	POAG moderate	POAG severe	Statistical significance
Nº of appointments per year	5.40	5.42	6.08	0.674
Non-medical Direct Costs (R$)				
Transport/appointment	53.42	69.41	52.67	0.800
Accomod./appointment	15.00	19.47	18.95	0.966
Food/appointment	12.25	7.16	15.92	0.404
Chaper./appointment	22.77	27.88	32.14	0.822
Total	**587.47**	**660.52**	**708.54**	**0.932**
Non-medical Indirect Costs(R$)				
Retirement (annual)	1.717.20	5.422.74	6.627.79	0.390
Social security benefit (anual)	572.40	602.53	0.00	0.377
Lost workday appointment	19.08	20.08	17.57	0.844
Total	**20.156.75**	**26.988.16**	**27.263.82**	**0.784**

POAG: Primary Open-Angle Glaucoma

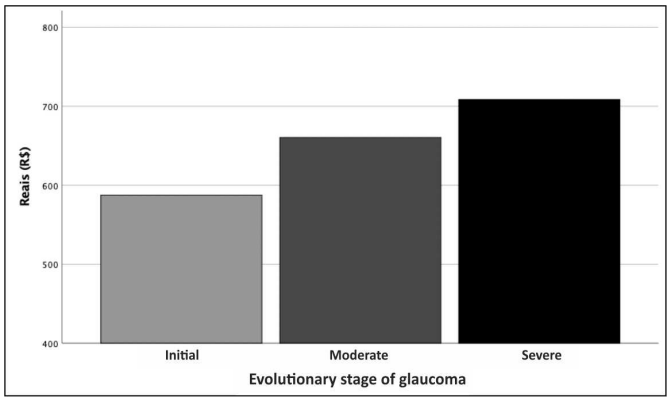

Figure 1: Average annual non-medical direct cost according to the evolutionary stage of primary open-angle glaucoma

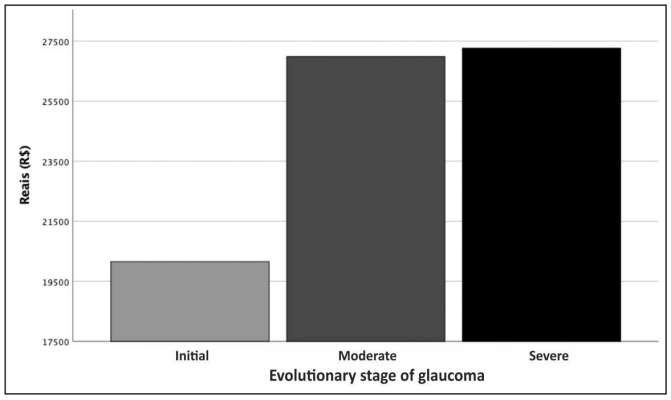

Figure 2: Average annual non-medical indirect cost according to the evolutionary stage of primary open-angle glaucoma

Discussion

The present study identified the average values of non-medical costs related to POAG for the Brazilian reality. To our knowledge, there are no similar studies in Brazil in the literature.

Indirect costs are significantly higher than non-medical direct costs. An average glaucoma patient generates on average the cost of approximately R$ 25,000.00 per year of incapacity for work and loss of productivity. If we look at the prevalence of POAG and the tendency of its increase in the future, the economic impact on society is very important. Non-medical direct costs (transport, food, accomodation and chaperone) also generate a significant increase in costs related to glaucoma (between 600 and 700 reais per year per patient). This type of cost becomes more important when one considers that this cost tends to be paid, in most cases, by the patients themselves.

When analyzing the average of non-medical costs according to the evolutionary stage, it is noticed that there was no statistical difference between the initial, moderate and severe groups. In spite of this, there is a tendency of increase in the costs with the progression of the disease, mainly in non-medical direct costs. In the indirect costs, the biggest difference is between the initial POAG and the other stages. There is practically no difference in indirect costs between moderate and severe POAG.

In general, the more advanced the glaucoma, the more spent on it. This tendency has already been demonstrated in the world and Brazilian literature.[11,16,18–21] The direct costs of POAG were calculated in the different stages of the disease. On an annual average, the cost went from $ 623 in the early stages to $ 2,511 per patient in the more severe stages.[20] Medications are the ones impacting the most direct costs, ranging from 24% to 61% in the various stages of the disease. Medical appointments tend to increase according to the severity of the disease, from 2.9 per year on average in the initial cases to 3.7 per year in the more severe stages.[11] In the present study, the number of appointments did not vary among the evolutionary stages, since the patients followed the protocol of number of appointments of the public policy of care to the patient with glaucoma of the Ministry of Health.

Regarding the impact of non-medical costs, there are few studies in the literature. Non-medical expenses related to blindness in general were studied in France, and the average annual cost of a blind individual was 15,679 euros.[12]

In Brazil, a study from 2002 indirectly verified the impact of the cost of treating glaucoma for individuals. The average monthly cost of treatment with eye drops was 36.09 reais, equivalent to 15.5% of the average family income of the time. It was also concluded that about a quarter of patients had 25% or more of their family income compromised with glaucoma treatment, and 45.2% had difficulty buying medication at a given time of treatment.[22]

There is an important fact in this study. The vast majority of patients report the need for a chaperone to come to appointments and exams, with no influence of the glaucoma stage. This shows that the indirect cost of chaperones cannot be neglected, both from the individual point of view (their own expenses) and from the collective point of view (impact on society of the loss of productivity). A little more than half of patients interviewed reported their own or their chperone's workday loss.

Although the average age of patients is around 65 years (when many patients have their working time retirement), approximately one-fifth of patients reported that the reason for retirement would be glaucoma. It was also observed that few patients reported receiving sick pay due to glaucoma, and most of them in the earliest stages, whereas retirement reached patients in the more severe stages.

One of the main limitations of the present study is the limited number of the sample when it is subdivided into the 3 stages of glaucoma. Another limitation would be carrying out the present study in a single center of a medium-sized city in southeastern Brazil. The results of this study need confirmation in other populations of other Brazilian regions, in order to facilitate the extrapolation of results for the entire Brazilian population.

In any case, the present pilot study works as the basis for future studies to investigate these non-medical costs related to POAG in Brazil.

Conclusion

The present study concludes that the average non-medical direct and indirect costs related to the POAG were identified for a sample of the Brazilian population. Indirect costs are much higher than the non-medical direct costs, and both tend to increase as the disease progresses.

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