The socioeconomic impact among Egyptian glaucoma patients

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Background/aim: To evaluate the economic burden of intraocular pressure (IOP)-lowering medications on Egyptian patients with glaucoma, in addition to studying the social grounds of glaucoma education.

Methods: In a cross-sectional observational study, the clinical and socioeconomic data were collected from 68 glaucomatous patients who were attending the outpatient clinics of Cairo University Hospital, through interviews, questionnaires, and clinical examinations.

Results: Patients had a mean IOP of 22.9 mm Hg (SD 11.5). Just under half the patients had an IOP of over 30 mmHg although 88% were on medical treatment; average of 2.1 medications (SD 0.8). Patients had been spending 79.5 LE (SD 95.3) on glaucoma medications a month, which equals 30.1% of their monthly income. Forty per cent of patients did not know that glaucoma causes blindness. The primary source of knowledge about glaucoma for 79.4% of patients was the ophthalmologist.

Conclusion: The lack of control of IOP is probably related to the economic burden associated with glaucoma medications. 'Glaucoma education' is an important issue to both the treating ophthalmologist and the patient.

A systematic review of World Health Organisation (WHO) surveys on blindness and low vision in 2002 showed that there are 37 million blind people worldwide, with 12.3% (4.4 million) attributable to glaucoma, second only to cataract (48%).¹ Quigley *et al.*² predicted that 8.4 million people will be blind as a result of primary glaucoma by 2010, rising to 11.1 million by 2020. The number of individuals who are blind is a fraction of those suffering from the disease, the authors estimated that the number of people with primary glaucomas will be 60.5 million by 2010, increasing by 20 million over the subsequent decade.²

The study conducted by Lee and coworkers³ suggested that resource use and direct costs of glaucoma control increase with worsening disease severity. On the basis of these findings, a glaucoma treatment that delays the progression of disease could have the potential to reduce significantly the health economic burden of this chronic disease over many years. Although the probability of treatment success should be the primary factor guiding the choice of an intraocular pressure (IOP)-lowering medication, treatment cost is also important to physicians, patients and third-party payers.⁴ In the current study we did not evaluate the economic burden through the actual cost analysis but from the patient's point of view. We also aimed at describing the social patterns of glaucoma awareness on Egyptian patients with glaucoma.

MATERIALS AND METHODS

Written consents were obtained from 68 patients (135 eyes) who were attending the outpatient clinics of Cairo University Kasr Eleini Hospital and met the inclusion and exclusion criteria. Inclusion criteria included all types of chronic glaucoma patients (except congenital) whether operated on or not, and who were below the average socioeconomic standard, which is defined to be less than the gross national index per capita announced by the World Bank in 2005, i.e. annual income less than 7250 LE (US\$1250, US\$1.00 = 5.8 LE). Exclusion criteria included first time attendants and patients with glaucoma associated with other chronic ophthalmic disorders requiring medical attention. All patients attending Kasr Eleini Hospital had been receiving 100% free service regarding medical appointments, ophthalmological examinations and surgical interventions. Similarly, all

patients had been getting 100% free medications (mydriatics, steroids and antibiotics). In addition, perimetry tests were also performed for free. The monthly expenditure on IOP-lowering medications had always been the responsibility of the patients.

Data were collected from patients recruited for the study through direct interviews, questionnaires, and clinical examinations by senior residents, who knew clearly the content of questions and the methodology of data collection. The aim of the study was, however, concealed from them to avoid performance bias. Data are presented in three sets: first, clinical data, which include patients' clinical history and examination as well as the number of antiglaucoma medications and the number of perimetry tests; second, economic data, which include the patient's monthly income, and his/her average monthly spending on IOP-lowering medications of whatever type or brand, thus we calculated the percentage of his/her spending in relation to his/her income; third, social grounds of glaucoma awareness; all patients were asked "Did you know that glaucoma is a disease that can lead to loss of useful vision in your eyes?". We also aimed at identifying the primary source of knowledge about glaucoma in each patient.

The data collected were tabulated and analysed. Statistical analysis including analysis of means between both sexes was done using SPSS software (SPSS Inc., Chicago, Illinois, USA). All statistical significance tests were at the 5% probability level.

RESULTS

Clinical data

All 68 patients included in the study are glaucoma patients (95% confidence interval 2.08–4.1). The age of patients ranged between 8 and 75 years with mean of 47.75 years (SD 15.4). The male to female ratio was 1 : 1. The overall mean follow-up duration of glaucoma was 3.4 years (SD 4.8); 4.3 years in men and 2.5 years in women. Comparing the previous results between both sexes proved not to be statistically significant ($p < 0.001$). The average IOP was 22.9 mm Hg (SD 11.5), with 44% of patients having an IOP of over 30 mm Hg; 88% were on medical treatment with an average of 2.1 medications (SD 0.8). The number of ophthalmic clinics attended per patient (after the patient was diagnosed with

Abbreviation: IOP, intraocular pressure

glaucoma up to the time of the questionnaire) was 12.5 (SD 20). Comparing the previous results between both sexes proved not to be statistically significant ($p < 0.001$). Thirty-eight per cent had never done nor had been asked to do any perimetry test, whereas the remaining 62% had performed 2.6 (SD 2.5) perimetry tests. Comparing the previous results between both sexes proved not to be statistically significant ($p < 0.001$).

Economic data

The monthly income as claimed by patients ranged between 100 and 3000 LE with an average monthly income of 448.5 LE (SD 428.3). Patients' monthly spending on glaucoma ranged between zero and 500 LE, with a mean of 79.5 LE (SD 95.3), which equalled 30.1% (SD 35.3) of their monthly income. Comparing the previous results between both sexes proved not to be statistically significant ($p < 0.001$). Their mean annual spending was calculated to be 954 LE and might range up to 2097.6 LE.

Social grounds of glaucoma education

Forty per cent of patients did not know that glaucoma causes blindness. The primary source of knowledge about glaucoma data for patients was mainly the ophthalmologists, followed by friends and relatives. Newspapers, TV and non-ophthalmic doctors played a smaller role, whereas radio, movies, and the Internet appeared to play no role at all (table 1).

DISCUSSION

To the best of our knowledge, this is the first report that evaluates the economic burden and social grounds of 'glaucoma education' among Egyptian glaucoma patients. Regional studies in Egypt have evaluated glaucoma as a cause of blindness. No regional reports have described the economic burden of medical treatment on glaucoma patients. Glaucoma was the cause of acquired blindness in 12.1% of cases in Mansora.⁵ Similarly, glaucoma was the cause of blindness in 19.7% of cases in a study in Alexandria, 7.6% in the Al-azhar University Study, and 9.2% in Shibin El-Kom.⁶⁻⁸ El Gilany *et al.*⁵ asserted that health insurance was the source of healthcare for more than 80% of participants, whereas 13.3% received free service. On the other hand, all patients recruited into our study were receiving free service. Fraser *et al.*⁹ showed that deprivation is associated with the presentation of advanced glaucomatous optic neuropathy to hospital clinics, which represents an important risk factor for blindness from glaucoma.

Ang and Eke¹⁰ described a mean follow-up duration of 7.4 years (range up to 29). Their average number of clinic visits was 18 (SD 17, range 1–95). The greater number of clinic visits can be explained by a longer follow-up in contrast to our results. The Tanjong Pagar Study was a cross-sectional study of Chinese individuals aged 40–79 years, who were randomly selected from the Singapore electoral register. The authors found that participants with lower education and income had a higher

mean IOP. Yip *et al.*¹¹ concluded that their study (the Tanjong Pagar Study) was the first to suggest that there was a socioeconomic gradient in the distribution of the only major modifiable risk factor for IOP. That study did not, however, establish a relationship between socioeconomic effect and glaucoma. Moreover, the diversities in the samples of population in the previous studies, in contrast to our study, might give an explanation for these differences. In a study in Singapore by Wang and Chew,¹² the annual spending on glaucoma was between US\$879.45 and US\$2576.39. The difference in spending is very evident and may be explained not only by the different economic patterns between different populations, but also by the difference between health systems in different countries.

If we combine the two facts that a significant proportion of patients did not know that glaucoma causes blindness and that ophthalmologists are the main educators, we may illustrate a major health problem regarding glaucoma education. A relatively high proportion of patients who had not done perimetry tests might add to the problem that some ophthalmologists also need glaucoma education. We conclude that the identified economic burden together with the lack of glaucoma awareness among Egyptian patients may result in the suboptimal management of glaucoma. The role of friends and relatives should never be underestimated. The weak role of the media in 'glaucoma education' should be highlighted. A multicentre study including various general hospitals in different Egyptian towns and cities is recommended.

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Table 1 Primary source of knowledge for glaucoma patients

Source of glaucoma knowledge	%
Ophthalmologists	79.4
Friends	8.8
Relatives	4.4
Newspapers	2.9
TV	2.9
Non-ophthalmic doctors	1.5
Radio	0
Movies	0
Internet	0