Impact of Nd: YAG capsulotomy on quality of life in pseudophakic patients

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Abstract

Objective: To determine whether visual acuity (VA) improvement in patients with posterior capsule opacification (PCO), accepted after the capsulotomy, is followed by positive changes in the perception of their quality of life.

Method: A total of 130 patients with PCO were examined before and after capsulotomy. In addition to the ophthalmic examination, the EuroQol questionnaire was completed. We analyzed the influence of demographic characteristics on the outcome of the test.

Results: The mean binocular visual acuity (BVA) and the mean scores in the EuroQol dimensions and EQ-VAS improved significantly after capsulotomy. VA did not have the same effect on daily common tasks. After treatment, the problems in the usual activities dimension have seen the largest reduction. Mobility is still the dimension with more problems regarding patients after capsulotomy.

Conclusions: Decreased VA induced by PCO is associated with difficulties performing daily living activities. Capsulotomy results in a gain in VA and functional ability of the majority of patients, improving the perception of their quality of life.

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Impacto de la capsulotomía Nd: YAG en la calidad de vida de pacientes pseudofáquicos

Palabras clave:
Calidad de vida
Capsulotomía
Cuestionario EuroQol
Opacificación de cápsula posterior

Resumen

Objetivo: Determinar si la mejora de agudeza visual (AV) en los pacientes con opacificación de cápsula posterior del cristalino (OCP) que se acepta tras la capsulotomía, se traduce en cambios positivos en la percepción de su calidad de vida.

Método: Se evaluaron 130 pacientes con OCP antes y después de la capsulotomía. Además de la exploración oftalmológica se recogieron las respuestas del cuestionario EuroQol y se estudió la influencia de factores demográficos en el resultado del test.

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Introduction

Lens posterior capsule opacification (PCO) is the most frequent complication after cataract surgery.\(^1\) Despite the development of surgical techniques, the percentage of patients with PCO continues to be considerable.\(^2\) At present, only Neodymium–Ytrium Argenti (Nd: YAG) laser capsulotomy retains the ability to revert the visual deficit caused by capsular opacification. In addition to being costly for the health system in terms of time and expense, this procedure involves an alteration of theocular compartments that increases the risk of suffering severe posterior segment pathologies.\(^3\) Accordingly, as this technique is not free of possible complications, it should not be based exclusively on the patient visual acuity\(^4\) and on its possible improvement but rather on the measurement of the impact of said procedure on the quality of life of the individual.

In recent years, research on quality of life has increased progressively in various areas of professional and scientific activities. Modern medicine is showing a growing interest in the assessment of the physical, mental and social conditions of patients. Attention is focused on the quality and value of an individual’s lifetime and not only on its duration. What matters in this new century is how the patient feels instead of how the physician believes he should feel on the basis of the clinical measures.\(^5,6\) In ophthalmology, this type of study is acquiring greater relevance as the loss of vision can have a deep impact in the quality of life of patients.\(^7\) In recent years, a range of papers have been published on the impact of capsular opacification treatments on the daily life of subjects suffering the said pathology.\(^8,9,10\) The visual requirements of individuals are different and therefore the main reason for performing capsulotomy should not be only visual acuity and the degrees of PCO but also the way in which it interferes with the patient’s lifestyle and its influence in everyday activities.

This paper aims at assessing the repercussion of PCO and capsulotomy in the quality of life of patients. To this end, a previously validated questionnaire, EuroQol, has been utilized. As with current VA measurements, it has also been promoted to assess the need for treatment and the results thereof.

Subjects, material and methods

A prospective, longitudinal and comparative study was carried out comparing the condition before and after Nd: YAG laser capsulotomy in 130 subjects diagnosed with PCO between June 2008 and May 2009. The study included patients with the same type of hydrophilic and straight edged intraocular lens (Ajl Miñano, Álava, Spain. Mod. Y601079) located in the posterior chamber and without surgical complications. The study excluded patients who had undergone extracapsular removal of the lens, and had been intervened by ophthalmologists in training periods and who were unable to understand or communicate.

The participants were recruited consecutively and interviewed personally in the ophthalmology consulting room before the capsulotomy and 3 weeks after it. The examiner was always the same ophthalmologist to ensure that the assessment criteria, methodology and procedures were identical for each patient. In addition a complete ophthalmological exploration was made which included best corrected binocular visual acuity (BVA), as good vision in one eye can compensate the poorer vision of the contralateral eye at the time of carrying out many activities.

In order to measure the quality of life related to health, the EuroQol-5D (EQ-5D) questionnaire was utilized. This is a generic instrument devised for providing 3 types of information: a descriptive profile of the quality of life of the individual in different areas, a general evaluation of the quality of life by the respondent and a value that represents the preference of the individual for being in a specific state of health. The questionnaire included the first and second part of EQ-5D (Appendix B), that is, 5 questions the areas of mobility, personal care, daily activities, pain/discomfort and anxiety/depression, as well as the analog visual scale (AVS) to measure the overall state of health of participants.

An initial description of the study population was made and subsequently the data were assessed after being segmented by sex, age, civil status and work activity. The decimal visual acuity was converted to the logarithmic scale. For analyzing the qualitative data, the Chi square and Fisher’s exact tests were utilized when necessary, whereas for analyzing quantitative data the t for Student was utilized. For the
Results

The study included 130 patients diagnosed with PCO and indication for Nd–YAG laser.

The characteristics the participants are summarized in Table 1.

The mean BVA improved after the capsulotomy (0.51 log MAR) in a significant manner (p < 0.01). Nearly 80% of the patients obtained higher BVA values, while 18% remain stable and 3 patients worsened. In addition, the mean score of AVS after treatment also improved (72.6 SD 17.32) with respect to the AVS before the treatment (60.7 SD 14.53) in a statistically significant manner (p < 0.01). The correlation between the BVA improvement and the AVS score improvement was of 0.25 (p < 0.01).

Figs. 1 and 2 illustrate the percentage of patients who declared “no health problems” (level 1) in any of the 5 areas and those who expressed moderate or severe “health problems” (levels 2 and 3) in one or more periods before and after the capsulotomy. Said figures also show the percentage of patients with problems in each area before and after the treatment.

Tables 2 and 3 indicate the percentage distribution of the EQ-5D areas and the mean AVS segmented by sex, age, civil status and work activity of the patients who declared some health problem (moderate or severe) before and after the capsulotomy. The participants with PCO indicated more problems in the pain–discomfort area, followed by daily activities. Both improved significantly after the treatment, illustrating greater autonomy and lower dependency for carrying out their activities. However, the percentage that continues to relate problems after the capsulotomy is quite high. It must be taken into account that most patients were elderly, and it seems that improvements in their functionality does not allow them to set aside other pathologies entirely.

Even though it has shown statistically significant improvements, the area of mobility maintains the greatest difficulties after the elimination of PCO. This indicates that in these subjects this function is not severely impaired by the visual deficiency and that it is determined mainly by other conditions.

The area in which patients declared the lowest number of problems is in personal care, both before and after the capsulotomy. In general, the visual deficit does not produce difficulties in this type of tasks, even with significant vision alterations.

Our patients also referred less problems in the anxiety–depression area prior to the capsulotomy. This could be partly due to the negative impact of PCO on their quality of life. After the treatment, the improvement is statistically significant but lower than in other areas. In epidemiological research it is usual to find lower prevalence rates of psychological problems in the elderly under stressful situations such as visual deficiency.

Classifying the patients by sex, the percentage of health problems in all areas is higher in women, with the exception of daily activities. Women exhibit lower self-perception of quality of life (AVS), but without these differences being statistically significant.

Similarly, no important discrepancies arose in the perception of the state of health of patients according to civil status, although widowed patients consider it less favorably.

In accordance with the hypotheses that the increase of age causes a deterioration of the state of health, the study reveals that in elderly patients the probability of exhibiting health problems increases in all the EQ-5D questionnaire areas, with the exception of anxiety–depression, which goes against this trend. Elderly people frequently consider their depression as a normal characteristic of their evolutionary stage and therefore do not describe the quality of life reduction caused by the visual alteration induced by PCO as the cause of depression or anxiety. Accordingly, the shortcomings indicated in this area are similar before and after the capsulotomy. Similarly, younger patients referred more problems in the pain-discomfort area before the capsulotomy. The positive influence of health in this area has been described in other studies. The elderly seem to accept their state of discomfort as one of the conditions inherent in growing older. However, after the capsulotomy, the younger respondents referred a statistically analysis, the SPSS 15.0 application was utilized (SPSS Inc., Chicago, IL, USA).

Discussion

Almost exclusively the analysis of the laser capsulotomy results were based on the VA changes. However, this parameter underestimates the functional limitations prior to the treatments in patients with acceptable vision as well as the overall benefits for the subjects with poorer visual results.

In this study, by measuring the VA and quality of life with the EQ-5D questionnaire we have seen a positive evolution of the PCO patients after capsulotomy. Not only does their VA improve (which is already known) but also the treatment generally produces an improvement in the perception of their quality of life.

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marked improvement, which indicates a reduction in the limitations of the physical, social, emotional and vital functions, which has an important influence in the perception of their psychological welfare.

Differences were found in the problems described in the mobility area in different age groups. Although the visual disorder brought about by PCO worsens this disability in older individuals, there are many other factors that limit the mobility in this age group. The mean AVS score diminishes with age in a statistically significant manner. After the treatment, it improved in all age groups. The results obtained match the evidence appearing in other papers, which demonstrates that with the increase of subjects’ age the overall health condition deteriorates. The high prevalence noted nowadays in chronic diseases in the elderly justifies the results related to the subjective health of our patients.

Classified by their work situation, active subjects were those who declared the lowest amount of problems both before and after the PCO treatment, without giving rise to statistically significant differences. In the group of retired individuals and those carrying out domestic chores, the most frequent health problems were in mobility and daily activities, while the individuals who still worked had a lower score in the society-depression area. The AVS improvement was lower in the group carrying out domestic chores. This group is mainly comprised by women over 60, who exhibited a more...
Table 3 – Percentage of individuals who referred problems in EQ-5D in each of the areas after capsulotomy.

<table>
<thead>
<tr>
<th>Areas</th>
<th>Mobility</th>
<th>Personal care</th>
<th>Daily activities</th>
<th>Pain–discomfort</th>
<th>Anxiety–depression</th>
<th>EVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>45.3</td>
<td>18.6</td>
<td>24.4</td>
<td>37.2</td>
<td>31.4</td>
<td>71.6</td>
</tr>
<tr>
<td>Male</td>
<td>29.5</td>
<td>18.2</td>
<td>25</td>
<td>35</td>
<td>18.2</td>
<td>74.6</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>40–59</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>89.4</td>
</tr>
<tr>
<td>60–74</td>
<td>32</td>
<td>14</td>
<td>20</td>
<td>36</td>
<td>36</td>
<td>71.9</td>
</tr>
<tr>
<td>75–89</td>
<td>55.2</td>
<td>27.6</td>
<td>36.2</td>
<td>44.8</td>
<td>27.6</td>
<td>68.1</td>
</tr>
<tr>
<td>Civil status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>18.2</td>
<td>9.1</td>
<td>27.3</td>
<td>40.9</td>
<td>27.3</td>
<td>76.1</td>
</tr>
<tr>
<td>Married</td>
<td>42.8</td>
<td>19</td>
<td>23.8</td>
<td>33.3</td>
<td>22.6</td>
<td>73.6</td>
</tr>
<tr>
<td>Widowed</td>
<td>54.2</td>
<td>25</td>
<td>25</td>
<td>41.6</td>
<td>41.6</td>
<td>66.1</td>
</tr>
<tr>
<td>Work activity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>89.6</td>
</tr>
<tr>
<td>Retired</td>
<td>38.1</td>
<td>19</td>
<td>30.9</td>
<td>47.6</td>
<td>16.7</td>
<td>72.7</td>
</tr>
<tr>
<td>Domestic</td>
<td>56.2</td>
<td>25</td>
<td>29.7</td>
<td>42.2</td>
<td>43.7</td>
<td>66.3</td>
</tr>
</tbody>
</table>

The visual deficiency caused by PCO involves the appearance of certain difficulties for carrying out some daily activities. In the long term, this can affect multiple areas of quality of life of an individual. The VA improvement obtained with PCO does not seem to influence functional recovery, although we found that not always the increased vision matches an improved self-perception of the overall state of health of an individual.17,18 Accordingly, on many occasions VA need not be the most useful parameter to assess the functional limitations before the therapeutic procedure and the subsequent improvements. For this reason, it is increasingly important to consider not only the objectively measurable factors such as VA or to quantitatively assess the visual quality with modern technologies, but also to take into account the subjective factors in which the subjects’ opinion should be considered. It is not a matter of reducing the importance of the physical component of health but of enhancing it with the inclusion of other components and the experiences referred by the patients.

Therefore, the use of this type of quality of life study helps us to determine the actual situation of the patients, both from the objective viewpoint measurable by the clinician as well as from the subjective viewpoint considering the patient’s experience. On their own, these questionnaires do not determine the indication for an intervention (capsulotomy in this case) but can be an important tool to assess and understand the severity of the patients’ problems.

**Conflict of interests**

None of the authors have declared any conflict of interests.

**Appendix A. Additional material**

Additional material office article can be consulted in its e-format available at doi:10.1016/j.oftale.2011.01.002.

**REFERENCES**


