**Title:**

**Modifiable Determinants of Satisfaction with Intravitreal Treatment in Patients with Neovascular Age-Related Macular Degeneration.**

Short running title: **Patient satisfaction with treatment of neovascular ARMD**

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**ABSTRACT**

**Rationale, aims and objectives**: Intravitreal treatment with antivascular endothelial growth factor (anti-VEGF) for neovascular age-related macular degeneration (nARMD) has notably improved the historic blindness rates related to the disease. Success of this treatment is associated with medical visits and indefinitely and frequently repeated injections. The objective of this study was to explore the treatment satisfaction of nARMD patients to implement actions to improve treatment and increase treatment adherence.

**Method**: A prospective, observational, analytical, cross-sectional study was conducted. One hundred consecutive nARMD patients under anti-VEGF treatment for at least 1 year were included. Patients completed the Macular Disease Treatment Satisfaction Questionnaire (MacTSQ) and the EuroQol Visual Analog Scale (EQ VAS).

**Results**: The mean age of patients was 82.1±7.8 years, and 62% were female. The mean time of treatment was 45.5±27 months. Half of patients (49%) were receiving or had received treatment in both eyes, and 70% of patients preferred same-day assessment and injection. The correlation analysis showed that males (p=0.002) and patients who improved their visual acuity (p=0.004) were more satisfied and that patients who had a higher number of injections (p=0.036) and received treatment in both eyes (p=0.001) had lower satisfaction.

A predictive model for low MacTSQ values (total score <50) could be estimated based on the following variables: female sex, the patient coming alone to the clinic, longer time from the beginning of the treatment, and higher number of intravitreal injections.

**Conclusions:** Well-defined areas for improvement were identified, such as to improve and individualize the information offered to each patient so that their expectations are realistic, to incorporate new long-acting drugs and to establish locations for injection services in peripheral areas.

Key words: Patient Satisfaction, Age-Related Macular Degeneration, Wet Macular Degeneration, Neovascular Age-Related Macular Degeneration, Antivascular Endothelial Growth Factor, Intravitreal Injections.

**INTRODUCTION**  
In the last few years, health stakeholders have aimed to empower patients to improve care.[[1]](#endnote-1),[[2]](#endnote-2) Patients who are involved in their care can take greater responsibility and be more liable for their own care.2 This fact is crucial in the case of chronic diseases that involve therapies that require repeated on-time visits to the clinic for an indefinite period. This is the case for intravitreal treatment for neovascular age-related macular degeneration (nARMD).[[3]](#endnote-3)

Age-related macular degeneration (ARMD) is a degenerative disease that affects the central retina and is the leading cause of blindness in developed countries.[[4]](#endnote-4) In Spain, 10.3% of people over 65 show early signs of the disease, consisting of the presence of small deposits of acellular debris under the retina called drusen.[[5]](#endnote-5) Although aging is the most important factor, genetic and environmental factors have an important role in the development and progression of the disease.[[6]](#endnote-6) Early forms of the disease do not entail vision loss, but blindness can occur in the late stages.6 Late- or advanced-stage ARMD has two dissimilar phenotypes: wet or neovascular ARMD (nARMD) and atrophic ARMD.[[7]](#endnote-7) The wet or neovascular form of the disease is characterized by the formation of new vessels.[[8]](#endnote-8) Vascular endothelial growth factor (VEGF) is the most important biochemical agent responsible for the development of these new vessels. Intravitreal injections of anti-VEGF agents have been demonstrated to be effective in the treatment of nARMD, with minimal adverse effects.3 Nearly 2.5% of people over 65 suffer the neovascular form of the disease and will develop blindness if untreated.[[9]](#endnote-9) However, since the introduction of anti-VEGF therapy in 2006, there has been an up to 2-fold decrease in legal blindness due to nARMD.[[10]](#endnote-10)

Current intravitreal anti-VEGF therapies require repeated administrations, and in many cases, monthly or bimonthly medical visits are indefinitely required to obtain optimal results.[[11]](#endnote-11) In this sense, patient satisfaction is an important goal of anti-VEGF therapy, as it can influence adherence to medication and follow-up visits with a consequent increase in treatment success.[[12]](#endnote-12)

Although much research has been done to reduce the overload that these treatments cause to ophthalmic clinics,[[13]](#endnote-13) there are few data on how repeated outpatient appointments influence patient satisfaction with their treatment.[[14]](#endnote-14),[[15]](#endnote-15),[[16]](#endnote-16),[[17]](#endnote-17)

Apart from the peculiarities of patients in anti-VEGF treatment, many factors influence patient satisfaction in general.[[18]](#endnote-18) Certain controversy exists about the influence of demographic characteristics such as age, sex, income, or socioeconomic considerations on patient satisfaction.[[19]](#endnote-19) There are also physician-related factors, such as expectations about the treatment communicated to patients, doctor-patient communication and time spent talking to patients during the visit. System-related factors such as continuity of care, proximity and the clinical team also influence patient satisfaction.18

The purpose of this study was to explore the satisfaction of nARMD patients with antiangiogenic treatment and care received as a first step to implement possible actions to improve treatment, integrate modifiable determinants of patient perceptions into our visual care plans and adapt access to ophthalmic attention to align with patients’ needs.

**PATIENTS AND METHODS**

This was a prospective, observational, analytical, cross-sectional study. This research followed the tenets of the Helsinki Declaration of 1964 (last amendment, 2013), and the study protocol was approved by the Complejo Asistencial Universitario de Palencia (CAUPA) Research Ethics Committee with appropriate participant informed consent. Written consent was obtained from all participants.

**Setting**

This study was carried out in the Ophthalmology Service of CAUPA. CAUPA is a secondary care hospital with some tertiary care services; it belongs to the Castilla y Leon Region and the Spanish Public Health System. It provides free healthcare to people residing in Palencia Province (161.321 inhabitants in 94.95 km2), and many patients live more than 120 km away from the hospital.[[20]](#endnote-20) Castilla y León is one of the regions with the most aged populations in Europe, and more than 25% of its inhabitants are over 65 years old.[[21]](#endnote-21) Specifically, in Palencia Province, people over 65 represent 25.26% of the population.[[22]](#endnote-22) In 2019, more than 3,500 intravitreal injections were applied in the ophthalmology service of CAUPA.

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**Inclusion and exclusion criteria**

Patients diagnosed with nARMD under anti-VEGF treatment for at least 1 year who attended the ophthalmology service of CAUPA were included in the study. Consecutive sampling was carried out beginning on March 9, 2020, until 100 patients were reached on March 13, 2020. Individual interviews were conducted, and the patients were informed about the purpose of the study and signed the informed consent form.

Patients who had cognitive impairment, had intellectual deficiency, did not wish to participate or had severe pathology other than nARMD that could also affect vision were excluded.

**Study variables**

To explore health-related quality of life, patients completed the EuroQol Visual Analog Scale (EQ VAS); they also answered questions on sociodemographic data and completed the Macular Disease Treatment Satisfaction Questionnaire (MacTSQ) in individual interviews conducted by authors PSCM and AMAT.[[23]](#endnote-23) Patients were asked about their living conditions, people who accompanied them on hospital visits, their preference about same-day or another-day office visits and intravitreal injection, and bilateral same-day intravitreal injection if needed. It was also determined if the patient needed the help of the interviewer to complete the questionnaire. Information about the distance from patients’ residence to the ophthalmology service was also recorded.

The EQ VAS is a visual scale from 0 to 100, where 0 is the worst imagined state of health and 100 is the best. The EQ VAS registers the respondent’s self-rated health on a 20 cm vertical visual analog scale with the following endpoints: ‘the best health you can imagine’ and ‘the worst health you can imagine’. The results of the EQ VAS can be used as a quantitative measure of health as considered by the individual respondents.

The MacTSQ questionnaire is a validated questionnaire that was developed to evaluate satisfaction with therapies for macular disease, in this case intravitreal anti-VEGF treatment. The MacTSQ may highlight ways to improve patients’ experience of treatment. It consists of 14 items, each scored on a 7-point scale from 6 to 0, where 6 is very satisfied and 0 is very dissatisfied. Items 2, 3 and 7 are scored between 7 and 0. A score of 7 indicates that the respondent has not experienced treatment to be inconvenient. In a final item, respondents are invited to note any characteristics of the treatment with which they are satisfied or dissatisfied that are not covered by the questionnaire. The MacTSQ has 2 subscales. Subscale 1 analyzes the provision of information and the convenience of the treatment and contains six items (1, 9c, 10 to 13). Subscale 2 analyzes the impact of the treatment and contains six items (2 to 6, 8). Each item is scored between 6 and 0. The item scores are added together to obtain a subscale score between 0 and 36. The MacTSQ as a single scale combines the 12 items from the two subscales into a single scale, with a total score ranging between 0 and 72. Higher total scores and subscale scores represent greater satisfaction with the treatment. Item 7 of the MacTSQ questionnaire, which refers to the cost of treatment, was not included in the evaluation of the questionnaire in this study since intravitreal anti-VEGF treatment is available free of charge to patients belonging to the Spanish Public Health System.

Demographic and medical variables were retrieved from the clinical files of patients. The data included information about patients’ sex, age, treated eye/s, and time and number of injections from the beginning of intravitreal treatment. Best-corrected visual acuity (BCVA) and visual impairment grade as defined by the World Health Organization, both before treatment and at the visit in which the survey was conducted, were determined. The BCVA was recorded using a Snellen chart and converted to the logarithm of the minimum angle of resolution (LogMAR) using a validated procedure[[24]](#endnote-24). Visual acuity change per eye was considered improvement or worsening worsened if there was an increase or decrease of one step on the LogMAR scale, respectively. Regarding visual acuity change per patient in case of bilateral treatment, improvement was considered when there was improvement in both eyes or when the combined change in visual acuity in both eyes was an improvement. Worsening was considered when there was worsening in both eyes or when the combined change in visual acuity in both eyes was worsened.

Statistical analysis

Numerical variables were summarized as means and standard deviations, and categorical variables were summarized as frequencies and percentages. The 95% confidence interval (95% CI) was calculated for the corresponding parameters. We used t-tests, one-way analysis of variance or correlation coefficients to relate satisfaction scores with sociodemographic and clinical variables. A logistic regression was estimated to model the low values of the satisfaction score (MacTSQ) as a function of these explanatory variables. As a subproduct of this model, we obtained odds ratios (ORs), corrected by the other factors included in the model, and a prediction rule for low values of the satisfaction score. P-values lower than 0.05 were considered statistically significant. The statistical analysis was performed by using the R-4.1.0 package.

**RESULTS**

**Demographic and clinical characteristics of patients**

One hundred patients were included in the study. During recruitment, 3 patients were excluded: 2 because of cognitive impairment and 1 because of an unwillingness to participate.

The demographic and ophthalmological characteristics of the sample are shown in Table 1.

The mean age of patients was 82.1±7.8 years (range 61-98 years), and 62% were female. Most patients lived with their families (64%) and usually went to the hospital with a relative (86%). Six percent of patients had difficulties having someone to take them to the doctor in some cases. Almost half of the patients were receiving or had received treatment in both eyes (n=49). Most patients preferred same-day assessment and injection (n=70) and, for those who needed treatment in both eyes (n=49), they usually preferred to receive the injections on separate days (n=31).

Mean distance from home to hospital was 38.7 km. Forty percent of patients had to travel more than 27 km, and 10% had to travel more than 127 km to the hospital.

The mean EQ VAS score was 73.7± 18.5, with significant differences between men (81,03) and women (69,15) (p=0.002).

**Patient satisfaction based on the Macular Treatment** **Satisfaction Questionnaire (MacTSQ)**

The total and detailed results of the MacTSQ questionnaire are presented in Table 2. The mean total score for the MacTSQ questionnaire was 53.4 ± 9.7. The mean score for subscale 1 (provision of information and the convenience of the treatment) was 28.9± 4.5, and that for subscale 2 (impact of the treatment) was 24.5 ± 6.2.

Each item of the MacTSQ questionnaire has a maximum score of 6. The lowest-rated items in subscales 1 and 2 were duration of treatment (4.2 ± 1.2) and discomfort or pain from treatment (3.0 ± 1.9), respectively. On the other hand, the highest-scoring item in subscale 1 concerned patients’ willingness to encourage another person with a similar pathology to receive the same treatment (5.5 ± 1.6), and in subscale 2, the highest-scoring item was “How bothered are you by the side effects or after effects you experienced with the treatment for your AMD?” (5.0 ± 1.6).

The MacTSQ total scores and subscales in relation to different variables are displayed in Table 3. Quantitative variables are shown in quartiles. For the open question “Is there any other comment?”, only two patients answered; these patients suggested the possibility of receiving the intravitreal injection nearer to their homes, as they lived more than 100 km away from the hospital.

Although 63% of patients receiving treatment in both eyes preferred injections on different days, patients receiving same-day treatment in both eyes were more satisfied than those receiving treatment on different days (p= 0.037).

Younger patients showed higher satisfaction on subscale 1, and this differenced neared statistical significance (p=0.056).

The following statistically significant correlations were observed between the MacTSQ score and sociodemographic and clinical variables: male patients (p=0.002) and patients who improved their visual acuity (p=0.003) were more satisfied on both MacTSQ subscales; patients who had a higher number of injections (p=0.036) and who received treatment in both eyes (p=0.001) had lower satisfaction, based on a worse score on subscale 2.

A predictive rule for a low MacTSQ total score (<50) based on the variables included in the model was obtained, with the performance level indicated by the sensitivity and specificity of approximately 72.7% and 70.1%, respectively. (Table 4). Factors independently associated with low satisfaction were being female, coming alone to the clinic, having a longer duration of treatment, having a higher number of intravitreal injections and having worsening visual acuity. Age was not independently associated with more/less satisfaction.

The analysis of satisfaction scores based on VAS scores is outlined in Table 2. Higher VAS scores were related to higher MacTSQ scores on subscale 2 (p=0.001) and to higher total MacTSQ scores (p=0.004).

**DISCUSSION**

Here, we present the results of a patient satisfaction study based on patients' experiences over a long period of time (mean 45.5 months). Although there have been other studies about satisfaction in patients with nARMD being treated with intravitreal injections, the present study provides relevant information about patients with nARMD who have been receiving intravitreal treatment for several years. The mean BCVA of our patients was maintained after nearly four years of treatment, which can be considered a good result in this disease. Nevertheless, caution must be taken when interpreting this result because it could be influenced by the fact that patients with poor results could have abandoned treatment earlier, either based on their own decision or the indication of their ophthalmologists.

Optimal results in the treatment of nARMD depend on maintaining consistent therapy over a long period of time, which is only possible with the best adherence to treatment, something that is directly influenced by patient satisfaction.14 In the present work, we found that patients’ general satisfaction was good, although there was room for improvement. The lowest-rated questions were those referring to the unpleasantness of the treatment, i.e., the pain and discomfort of the intravitreal injection procedure. The most uncomfortable aspects of treatment are the use of povidone-iodine before the injection, the injection itself, and the feeling after the anesthetic wears off.17 Despite the many studies carried out to find the best way to improve the experiences of patients undergoing intravitreal injections, it appears that all anesthetic methods seem to have similar effectiveness in reducing the pain and discomfort associated with treatment, which is something our group has also worked on.14,[[25]](#endnote-25) Patients also become discouraged by the repeated, indefinite nature of treatment. Using drugs with greater durability or long-acting intravitreal delivery systems that would require less frequent injections has not been possible until recently and is the goal of many studies.[[26]](#endnote-26)

Less satisfied patients included older patients, females and those receiving a higher number of injections. Older patients have a greater probability of having chronic illnesses and difficulties attending frequent visits, which may have influenced this result. It is also known that females have a higher life expectancy. Spain has one of the highest life expectancies in the world, at 80.9 years for men and 86.2 years for women in 2018.[[27]](#endnote-27) Nevertheless, the healthy life expectancy (without functional limitations or disability) is lower for women living more years with health problems.[[28]](#endnote-28) This fact could also explain the very large difference in satisfaction between males and females and the large difference in the self-assessment of health carried out through the VAS. The VAS is an easy-to-use instrument with proven validity and very good reliability, and it is easy to compare to values of similar populations. Its results are also comparable to those of multi-item questionnaires.[[29]](#endnote-29)

In the prediction rule elaborated with our sample to predict low levels of satisfaction with intravitreal treatment (less than 50 in total MacTSQ score), being female was weighted with an OR of 6.81, surpassed only by coming alone to the clinic, with an OR of 8.46. The reason why a patient comes alone to the clinic may be either that the patient does not need accompaniment or that the patient does not have a companion. In any case, emotional support or tangible support are essential for these patients. Thus, actions should be taken to identify these patients and refer them for social worker assessments.

It is also noteworthy that patients who considered themselves to be in good health (higher VAS) also had higher levels of satisfaction, especially in subscale 2, which analyzes the impact of the treatment. Other studies that have explored the relationship between satisfaction with a certain treatment and health-related quality of life found similar results, as more satisfied patients were also found to have a better opinion of their quality of life.[[30]](#endnote-30),[[31]](#endnote-31)

Other studies have used the MacTSQ (table 2). Translated versions of this questionnaire allow the performance of comparisons between different populations. In general, the satisfaction results in our study were worse than those obtained in the IVAN trial, as expected.[[32]](#endnote-32) Information on patients and the time of consultation in the real world cannot be as detailed and extensive as that in a clinical trial. Additionally, patients in real-world clinical practice are usually older and sicker than those enrolled in pivotal clinical trials.[[33]](#endnote-33) Other studies in real-life settings using the MacTSQ questionnaire have obtained scores similar to those obtained in the present work, such as the mean score of 52.7 obtained in the study by Gohil et al. and 58.65 in the study by Marakis et al., but unlike the significantly higher score obtained in the study by Boyle et al. (64.58).15,16,[[34]](#endnote-34) In this latter study, the 40 included patients also underwent semistructured, one-on-one interviews that showed some incongruity in the findings obtained by interviewing vs. the completion of the MacTSQ. The interviews disclosed important concerns such as treatment-related anxiety, financial and transport considerations and burden placed on relatives or caregivers and treatment side effects. 34 In contrast to the Gohil study, we did find less satisfaction in patients with worsening BCVA and in patients receiving more injections.15 In addition, in the Marakis study, obtaining more injections was also a negative determinant of satisfaction, but a remarkably higher score was obtained for the unpleasantness of the treatment (table 2).16 Travel considerations were an important concern in the Boyle study,34 and distance from home to hospital has been associated with long-term adherence to intravitreal treatment in nARMD patients.[[35]](#endnote-35) Similarly, in our study, patients who provided free comments at the end of the survey highlighted that it would be important for them to receive treatment near their homes.

Clinical outcomes, in this case maintaining or improving vision, are not always crucial for patient satisfaction.15,16 Nevertheless, we did find that patients with better clinical outcomes were more satisfied.

In our study, some patients reported not having received information or a take-home information paper even though all patients had signed and received a copy of an informed consent form containing information about the treatment; these patients probably did not pay attention to it or read it carefully. Most of the information that patients receive comes from their doctors,[[36]](#endnote-36) and most patients also seem to be willing to receive more information about their disease, which requires the patient and caregivers to spend time together.[[37]](#endnote-37) In recent years, the burden of intravitreal treatment has skyrocketed, with treatment taking a large proportion of the time of all members of the staff in a retina service, making the information process less thorough than would be desirable.13 In some countries, such as Australia, some patient support programs have been developed for patients with nARMD. Such programs can help patients better understand their disease, inform them about appropriate support services and provide them with continuous information.[[38]](#endnote-38) At this point, perhaps it would be useful to implement collaboration with patient associations that ophthalmologists could train so that they could provide reliable information and offer ARMD education to patients and their families. This is also important in the current times of fake news on the internet and social networks.

An important methodological limitation of present study was that participants were recruited from only one hospital with some distinct sociodemographic features based on the location of our hospital and the characteristics of the population it serves. While some studies highlight the importance of patients' demographic and social factors in defining satisfaction,[[39]](#endnote-39) a comprehensive meta-analysis sustained that patient demographics are an unimportant factor in patient satisfaction; the information drawn in present work can be of great interest for other retina services.19

Additionally, we have identified well-defined areas for improvement in our retina service such as to improve the information we offer to the patients, to incorporate new long acting drugs, and to establish locations for injection services in peripheral areas of our province to avoid patients having to make frequent and long trips to the hospital. It has been proven that patients being more informed about their disease and its treatment can lower the anxiety related to anti-VEGF therapy and empower patients to increase their adherence to treatment.31 It is also important to clarify from the beginning of treatment what the patient can expect in terms of the long duration and limited results of the treatment.[[40]](#endnote-40)

Finally, although a fully equipped macular unit is difficult to implement due to its high cost, peripheral locations for periodical intravitreal injections for patients under fixed regimens, loading doses or an “observe and plan regimen” can be more feasible.[[41]](#endnote-41)

**CONCLUSIONS**

We have identified well-defined areas for improvement, such as improving the information we offer to the patients, emphasizing the expectations of each case and the long-term duration of the treatment, incorporating new long-acting drugs, and establishing locations for injection services in peripheral areas. Patients’ medical information can be enhanced through collaboration with patient associations that could provide reliable information as well as offer ARMD education to patients and their families.

**Acknowledgments**

**Tables**

**Table 1. Demographic and clinical characteristics of the patients**

|  |  |
| --- | --- |
|  | **Mean ± SD [%] (95 CI%)** |
| Age (years) | 82.1 ± 7.8 (80.5%, 83.7%) |
| Sex  Male  Female | 38 [38%] (28,5%, 48,3%)  62 [62%] (51.7%, 71.5%) |
| Who filled out the questionnaire  The patient without help  The patient assisted by his or her companion  The patient assisted by an interviewer | 12 [12%] (6.4%, 20.0%)  15 [15%] (8.6%, 23.5%)  73 [73%] (62.2%, 81.4%) |
| Living conditions  The patient lives alone  The patient lives with his or her family  The patient lives in a nursing home  Other (with a friend) | 30 [30%] (21.2%, 40.0%)  64 [64%] (53.8%, 73.4%)  5 [5%] (1.6%, 11.3%)  1 [1%] (0-5%, 4%) |
| Accompaniment to the clinic  The patient alone  With his or her family  With a trusted person | 9 [9%] (4.2%, 16.4%)  86 [86%] (77.6%,92.1%)  5 [5%] (1.6%,11.3%) |
| The patient has someone to take him or her to the doctor if needed  None of the time  A little of the time  Some of the time  Most of the time  All the time | 0 [0%] (0%, 3.6%)  3 [3%] (0.6%, 8.5%)  3 [3%] (0.6%, 8.5%)  10 [10%] (4.9%, 17.6%)  84 [3%] (75.3%, 90.6%) |
| Time from the beginning of the treatment (months) | 45.5 ± 27 (40.2%, 50.9%) |
| The patient is receiving/has received treatment  Only in one eye  Right eye  Left eye  Both eyes | 51 [51%] (40.8%, 61.1)  27 [27%] (18.6%, 36.8%)  24 [24%] (16.0%, 33.6%)  49 [49%] (38.9-59.2) |
| Number of intravitreal injections applied per patient  Number of intravitreal injections applied per eye | 23.1 ± 13 (20.5%, 25.6%)  15.5 ± 9.6 (13%, 17.9%) |
| Preference: same day consultation and injection  Yes  No | 70 [70%] (60%, 78.8%)  30 [30%] (21.2%, 40%) |
| In patients receiving treatment in both eye: preference  Same day both eyes  Different day each eye | 18 [37%] (23.4%, 51.7%)  31 [63%] (48.3%, 76.6%) |
| Health-related-quality of life (VAS) | 73,7 ±18,5 (70%, 77,3%) |
| BCVA of treated eyes- LogMAR  Pretreatment  At the time of the study | 0.62 ± 0.46 (0%, 2.5%)  0.68 ± 0.61 (0%, 2.5%) |
| Visual impairment pretreatment  No impairment  Mild impairment  Moderate impairment  Severe impairment  Blindness | 62 [62%] (51.7%, 71.5%)  16 [16%] (9.4%, 24.7%)  15 [15%] (8.6%, 23.5%)  5 [5%] (2.9%, 13.9%)  2 [2%] (0.2%, 7.0%) |
| Visual impairment at the time of the study  No impairment  Mild impairment  Moderate impairment  Severe impairment  Blindness | 61 [61%] (50.7%, 70.6%)  25 [25%] (16.9%, 34.7%)  10 [10%] (4.9%, 17.6%)  4 [4%] (1.1%, 9.9%)  0 [0%] (0.0%, 3.6%) |
| Visual acuity change after treatment (149 eyes):  Improvement  No change  Worsening | 58 [38.9%]  33 [22.2%]  58 [38.9%] |
| Visual acuity change after treatment (patients):  Improvement  No change  Worsening | 38 [38%] (28.5%, 48.3%)  30 [30%] (21.2%, 40.0%)  32 [32%] (22.8%, 42.1%) |

**Table 2. Results of the MacTSQ**

**Relationship with visual analog scale and MacTSQ results in the literature**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Calles et al. | | | Gohil15 | Marakis16 |
|  | Mean SD (95 CI%) | | VAS | Mean SD | Mean SD |
| Q1. How satisfied are you with the treatment for your AMD? | 5.0 ±1.2 | (4.7%, 5.2%) | p=0.006 |  | 4.27 ±1.70 |
| Q2. *How bothered are you by the side effects or after effects you experienced with the treatment for your AMD?* | 5.0 ±1.6 | (4.7%, 5.3%) | p=0.335 |  | 5.27 ±1.46 |
| Q3. *How bothered are you by any discomfort or pain from the treatment for your AMD?* | 3.0 ±1.9 | (2.6%, 3.3%) | p=0.831 |  | 4.95 ±1.59 |
| Q4. *How well do you feel the treatment for your AMD is working?* | 4.7 ±1.2 | (4.4%, 4.9%) | p=0.002 |  | 4.43 ±1.62 |
| Q5. *How unpleasant did you find your treatment for AMD?* | 3.1 ±1.9 | (2.8%, 3.5%) | p=0.503 |  | 5.14 ±1.47 |
| Q6. *How apprehensive did you feel about your most recent treatment for AMD?* | 4.2 ±2.2 | (3.7%, 4.6%) | p=0.138 |  | 4.90 ±1.70 |
| Q7. How satisfied are you with any cost to you associated with the treatment for your AMD? | 5.1 ±1.1 | (4.9%, 5.3%) | p=0.381 |  | 3.98 ±2.21 |
| Q8. *How satisfied are you with the safety of the treatment for your AMD?* | 4.6 ±1.1 | (4.3%, 4.8%) | p=0.075 |  | 5.25 ±1.12 |
| Q9. Have you received information about the treatment for your AMD?  Yes/No | 81 81% | (71.9%, 88.2%) |  |  |  |
| Q9.a. Was the information received in an appropriate format for you to take home (e.g.. a brochure, a piece of paper)?\*\*  Yes | 40 49.4% | (38.1%, 60.7%) |  |  |  |
| Q9.c. How satisfied are you with the information provided about the treatment of your AMD? | 5.0 ±1.1 | (4.8%, 5.3%) | p=0.002 |  | 4.77 ±1.44 |
| Q10. If further treatment for your AMD were necessary, how satisfied would you be to continue or repeat the treatment? | 4.6 ±1.2 | (4.3%, 4.8%) | p=0.795 |  | 4.89 ±1.46 |
| Q11. How satisfied are you with the time spent at the hospital on each treatment day? | 4.6 ±1.3 | (4.4%, 4.9%) | p=0.547 |  | 4.51 ±1.53 |
| Q12. How satisfied are you with the time taken by the course of treatment for your AMD? | 4.2 ±1.2 | (4%, 4.5%) | p=0.057 |  | 4.58 ±1.45 |
| Q13. Would you encourage someone else with AMD like yours to have your kind of treatment? | 5.5 ±1.6 | (5.2%, 5.8%) | p=0.996 |  | 5.63±0.88 |
| Q14. Is there any other comment?  Yes/no |  |  |  |  |  |
| Subscale 1 | 28.9 ±4.5 | (28%, 29.7%) | p=0.087 | 27.6±3.9 |  |
| *Subscale 2* | 24.5 ±6.2 | (23.3%, 25.7%) | p=0.001 | 25.0±6.5 |  |
| Total out of 72 | 53.4 ±9.7 | (51.4%, 55.3%) | p=0.004 | 52.7±8.9 | 58.65 ± 10.61 |

**Table 3 Correlation of each variable with the MacTSQ score**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | | Subscale 1 | Subscale 2 | Total |
| Age | Q1 Age 61-76 | 30.6±3.97 | 24.6±6.17 | 55.2±9.15 |
| Q2 Age 77-83 | 29.32±3.67 | 23.52±6.99 | 52.83±9.75 |
| Q3 Age 84-87 | 27.3±4.70 | 25.54±5.67 | 52.84±9.87 |
| Q4 Age 88-97 | 28.54±5.07 | 24.52±5.77 | 53.06±10.11 |
|  | p value | 0.056 | 0.702 | 0.527 |
| Sex | Male | 30.15±3.78 | 26.89±4.72 | 57.04±7.07 |
| Female | 28.06±4.70 | 23.05±6.50 | 51.11±10.36 |
| p value | 0.023 | 0.002 | 0.002 |
| Who filled out the questionnaire | The patient without help | 30.55±5.15 | 25.33±9.03 | 55.88±13.53 |
| The patient assisted by his or her companion | 29.73±4.77 | 25.53±6.97 | 55.27±10.77 |
| The patient assisted by the interviewer | 28.39±4.26 | 24.16±5.45 | 52.56±8.67 |
| p value | 0.216 | 0.655 | 0.389 |
| Living conditions | The patient lives alone | 27.53±5.21 | 23.53±6.58 | 51.07±11.26 |
| The patient lives with his or her family | 29.54±3.48 | 24.8±5.82 | 54.33±8.04 |
| The patient lives in a nursing home | 30.2±7.43 | 28.8±5.63 | 59±12.71 |
| Other (with a friend) | 18 | 14 | 32 |
| p value | 0.345 | 0.408 | 0.335 |
| Accompaniment to the clinic | The patient alone | 28.24±4.49 | 23.67±6.14 | 51.91±9.24 |
| With his or her family | 28.95±4.57 | 24.67±6.31 | 53.63±9.94 |
| With a trusted person | 28.24±3.06 | 23.2±3.49 | 51.44±4.97 |
| p value | 0.861 | 0.799 | 0.795 |
| Time from the beginning of the treatment (months) | Q1 12-21 months | 27.9±4.72 | 24.25±7.55 | 52.15±11.56 |
| Q2 22-37 months | 30.05±4.31 | 25.08±6.00 | 55.13±9.40 |
| Q3 38-62 months | 29.32±4.34 | 24.31±6.19 | 53.63±9.25 |
| Q4 63-126 months | 28.09±4.44 | 24.40±5.02 | 52.49±8.57 |
|  | p value | 0.949 | 0.948 | 0.943 |
| The patient is receiving/has received treatment | Treatment in only one eye | 29.53±4.65 | 26.96±6.09 | 56.49±9.97 |
| Treatment in both eyes | 28.15±4.20 | 21.96±5.15 | 50.11±8.22 |
| p value | 0.124 | <0.001 | 0.001 |
| Number of IVIs per patient | Q1 \_3-12 | 29.19±4.76 | 26.79±6.32 | 55.98±10.57 |
| Q2 12-19 | 28.81±4.93 | 24.77±7.03 | 53.58±11.28 |
| Q3 20-28 | 29.77±3.98 | 24.67±5.54 | 54.43±8.08 |
| Q4 29-67 | 27.75±4.14 | 22.00±4.90 | 49.75±7.59 |
|  | p value | 0.383 | 0.008 | 0.036 |
| Pretreatment visual impairment | No impairment (≤ 0.3) | 29.21±4.32 | 24.68±6.3 | 53.89±9.63 |
| Mild impairment (>0.3 - ≤ 0.5) | 28.41±5.09 | 23.12±6.76 | 51.54±10.69 |
| Moderate impairment (>0.5 - ≤ 1) | 26.91±4.40 | 24±4.61 | 50.91±8.29 |
| Severe impairment (1-1.3) or blindness (>1.3) | 30.89±3.69 | 27.29±6.58 | 58.17±9.70 |
| p value | 0.601 | 0.729 | 0.983 |
| Visual impairment at the time of the study | No impairment | 29.85±3.82 | 24.92±6.46 | 54.76±9.41 |
| Mild impairment | 26.93±5.06 | 23.16±5.75 | 50.09±9.68 |
| Moderate impairment | 27.18±5.41 | 25.5±6.38 | 52.68±11.42 |
| Severe impairment or blindness | 29.95±3.65 | 24.25±2.63 | 54.2±5.82 |
| p value | 0.064 | 0.739 | 0.287 |
| Visual acuity change | Improvement | 30.46±3.35 | 26.63±5.32 | 57.09±8.02 |
| No change | 28.53±4.63 | 23.33±5.89 | 51.86±9.10 |
| Worsening | 27.25±4.94 | 23.09±6.76 | 50.34±10.71 |
| p value | 0.002 | 0.013 | 0.003 |

**Table 4. Predictive model of low satisfaction (MacTSQ<50)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | OR | 95% CI OR | 95% CI OR | p |
| Age | 0.94 | 0.6 | 1.47 | 0.78 |
| Sex= female | 6.81 | 1.95 | 23.83 | <0.001 |
| Accompaniment to the clinic= The patient alone | 8.46 | 1.4 | 51.04 | 0.02 |
| Time from the beginning of the treatment | 0.44 | 0.23 | 0.83 | 0.01 |
| Number of IVIs per patient | 2.11 | 1.1 | 4.04 | 0.02 |
| Visual acuity worsening | 2.65 | 1.38 | 5.12 | <0.001 |

**Table footnotes:**

**Table 1**

Q1 first quartile. Q2 second quartile; Q3 third quartile Q4 fourth quartile.

VAS: visual analog scale.

Visual impairment as defined by the World Health Organization: No impairment = LogMAR visual acuity ≤ 0.3; Mild impairment= LogMAR visual acuity >0.3 - ≤ 0.5); Moderate impairment=LogMAR visual acuity (>0.5 - ≤ 1); Severe impairment= LogMAR visual acuity (1-1.3) or blindness (>1.3).

BCVA: Best-corrected visual acuity

**Table 2**

Q= Question

Questions included in subscale 2 are in italics.

\*VAS: visual analog scale. Relationship between the score on each question with the VAS score. Higher VAS scores were related to higher MacTSQ scores on questions 1, 4,9c and on subscale 2, as well as a higher total MacTSQ score.

\*\*Only patients who answered “yes” to question 9 answered Question 9a.

**Table 3**

Quantitative variables are shown in quartiles. Visual impairment as defined by the World Health Organization: No impairment = LogMAR visual acuity ≤ 0.3; Mild impairment= LogMAR visual acuity >0.3 - ≤ 0.5); Moderate impairment=LogMAR visual acuity (>0.5 - ≤ 1); Severe impairment= LogMAR visual acuity (1-1.3) or blindness (>1.3).

**Table 4**

IVI= intravitreal injection

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