Original article

Intravitreal injections: What do patients prefer? Analysis of patient’s satisfaction and preferences about where to perform intravitreal injections

M. Rodríguez Ramírez*, M.I. del Barrio Manso, M.D. Martín Sánchez

Servicio de Oftalmología, Hospital Universitario Infanta Cristina, Parla, Madrid, Spain

ARTICLE INFO

Article history:
Received 26 December 2013
Accepted 28 May 2014
Available online 3 December 2014

Keywords:
Intravitreal injection
Satisfaction survey
Consultation room
Theatre
Preferences

ABSTRACT

Objective: To analyze satisfaction and patient preferences on the location where they receive an intravitreal injection.
Method: A survey was conducted with the intention of analysing those patients who attended the macula clinic and have been intervened using an intravitreal injection at least once in the day hospital or in the theatre setting, and comparing both locations.
Results: The majority of the interviewed patients preferred the day hospital (50.0 versus 37.5%), mostly because of the comfort and the quick service. In patients with severe age-related macular degeneration (AMD) the option is reversed. The overall satisfaction level was positive in both cases (with 87.5% of patients satisfied or very satisfied in the day hospital and 91.1% in the theatre setting). Through the analysis of different aspects of clinical care the assessment was the same or superior for 75.0% of these patients, except in the waiting time. There were no cases of endophthalmitis.
Conclusion: In general, patients prefer the clinical intervention in the consulting room than in the theatre setting because of the quicker service. There are several characteristics that can influence this choice and should be taken into account.

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Inyecciones intravítreas: y ¿qué prefieren los pacientes? Análisis de satisfacción y preferencias sobre la ubicación de la realización de inyección intravitrea

RESUMEN

Objetivo: Analizar las preferencias de los pacientes sobre el lugar donde son tratados con inyecciones intravitreas.

Palabras clave:
Encuesta de satisfacción
Inyección intravitrea

* Please cite this article as: Rodríguez Ramírez M, del Barrio Manso MI, Martín Sánchez MD. Inyecciones intravítreas: y ¿qué prefieren los pacientes? Análisis de satisfacción y preferencias sobre la ubicación de la realización de inyección intravitrea. Arch Soc Esp Oftalmol. 2014;89:477–483.

* Corresponding author.

E-mail address: monica.rodriguez@salud.madrid.org (M. Rodríguez Ramírez).

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Introduction

Intravitreal injections are minimally invasive procedures, which are increasingly used as treatment for many eye diseases.\(^1\) They consist in the application of a drug substance close to the action site, exactly in the posterior segment of the eye. Thus, its effect is maximized at local level and adverse systemic effects are minimized.\(^2\) Due to the pharmacokinetic characteristics of the drugs used, injections should be regularly repeated.

This procedure requires certain asepsis conditions to avoid infectious complications. Guidelines have been described to prevent the risk of endophthalmitis during the procedure, including the use of povidone–iodine, sterile material, face mask, etc., but there are no recommendations on the location required to perform it (theatre, consultation room, dressing room), as long as it is comfortable for the physician and the patient and enables the technique to be performed under sterile conditions.\(^3,4\)

Several studies have assessed aspects related to intravitreal injections, such as the incidence of endophthalmitis, comparing the theatre setting to the consultation room\(^5\)–\(^7\) and the benefit of intravitreal treatments\(^8\) for AMD, but no studies have been conducted on patients’ preferences about where to perform the injection.

At our hospital, for organizational reasons, this technique is performed regularly in a minor surgery room of the day hospital (Fig. 1) and in the theatre (Fig. 2).

The primary objective of this work is to assess, in terms of the user’s satisfaction, both hospital areas. For such purpose, patients filled in a survey, aimed at analysing their preferences and reasons. As secondary objectives, we intend to perform a comparative financial and safety assessment.

Materials and methods

A descriptive study of the results from a satisfaction survey has been conducted. As population sample, all patients who had undergone an ophthalmological checkup in the macula...
Ophthalmology Service Consultation Room

The Ophthalmology Service at the Hospital Universitario Infanta Cristina wants to know, for the improvement of the health care quality, the level of satisfaction of patients who receive intravitreal injections in a comparative way in two locations: day hospital and theatre setting, in order to identify areas which need to be improved. This questionnaire must be filled in by the patient only. Your data information will be treated anonymously and we would appreciate it if you could spend some of your time answering the following questions.

Please, fill in or answer the following questions:

* Gender: (mark as appropriate with an X)
  - Male
  - Female

* Age: (mark as appropriate with an X)
  - Between 18 and 35 years
  - Between 36 and 50 years
  - Between 51 and 65 years
  - Between 66 and 80 years
  - Older than 80 years

* Intervened eye (mark as appropriate with an X)
  - Right
  - Left
  - Both

* Are you independent for activities of daily living (bathing, getting dressed,...)? (mark as appropriate with an X)
  - Yes
  - No
  - Need help for most daily tasks

* Are you independent for activities of daily living (bathing, getting dressed,...)? (mark as appropriate with an X)
  - Yes
  - No
  - Need help for most daily tasks

* Are you independent for activities of daily living (bathing, getting dressed,...)? (mark as appropriate with an X)
  - Yes
  - No
  - Need help for most daily tasks

Taking into account the aforementioned aspects, indicate what your overall satisfaction level is regarding the care received at the day hospital (mark as appropriate with a circle)

- Very satisfied
- Satisfied
- Neither satisfied nor dissatisfied
- Dissatisfied
- Very dissatisfied

Taking into account the aforementioned aspects, indicate what your overall satisfaction level is regarding the care received at the theatre (mark as appropriate with a circle)

- Very satisfied
- Satisfied
- Neither satisfied nor dissatisfied
- Dissatisfied
- Very dissatisfied

* What is your main reason for this choice in the overall preference?

Assuming that you have some suggestions or complaints, could you please indicate which one?

Please, hand in this survey to the nursing staff or physician upon completion. Thank you very much for your cooperation.

To be filled in by the physician:

- Disease
- Degree of severity of the disease
- Number of injections applied so far
- Drugs administered
- Needle used
- Complications

Fig. 3 – Survey.

### Criteria to assess the degree of severity of the disease are established based on visual acuity (VA), being mild for patients with VA > 0.6, moderate for VA 0.1–0.6 and severe for VA < 0.1.

The statistical method used was the McNemar test and the Fischer’s exact test for proportions, and the Wilcoxon, SPSS version 14.0 (SPSS Inc., Chicago, Illinois), for quantitative variables.

Asperis measures applied have been identical in both locations, following the hospital protocol: the use of a face mask, surgical hand scrub, the use of gloves and sterile material, skin and fornix scrub with povidone–iodine (chlorhexidine in allergic patients), the use of operative field, separation of eyelashes with sterile adhesive and blepharostat and the application of postoperative antibiotic eye drops for one week (tobramycin or ofloxacin if allergic).

If the procedure is carried out in the theatre, the patient must wear surgical clothing (after taking his/her own clothes off) and have an intravenous catheter placed. In the day hospital, disposable garments are worn over the patient’s own clothes, typically without any intravenous catheter.

### Results

A satisfaction survey was conducted in 57 patients of the Macula Unit. Only one patient could not complete it since she had moderate Alzheimer’s and did not
remember the circumstances in which the injections had been developed; therefore, this case was excluded from the outcome analysis and only 56 cases were considered.

**Patient’s data and disease**

By age groups, the most frequent has been the one of patients aged between 66 and 80 years, with a relative frequency of 53.6%. Altogether, 76.8% of patients were older than 65 years. There is a higher proportion of men, 60.7%, compared to 39.3% of women (Fig. 4).

The most common disease is exudative AMD, which accounts for 75.1% of cases; it is followed by myopic neovascularization and macular oedema induced by venous thrombosis with the same number of patients (10.7%), diabetic macular oedema and neovascularization secondary to trauma (Fig. 4).

Out of the studied patients, only two were not independent for activities of daily living.

**Satisfaction analysis**

In the overall preference analysis, 50.0% of the interviewed patients choose the day hospital, compared to 37.5% who choose the theatre.

No significant differences between AMD and the rest of the diseases are seen regarding the percentage of patients who choose the day hospital (51.2 versus 50.0%; \( p = 0.779 \)).

In the subgroup of patients with severe AMD (with VA lower than or equal to 0.1, which corresponds to legal blindness), there is a higher percentage of patients who prefer the theatre (50.0%) compared to the day hospital (30.0%).

Sixty per cent (60.0%) of patients who have received five or more injections prefer the day hospital compared to 36.0% who prefer the theatre (\( p = 0.287 \)) (Fig. 5).

Preferences according to age and gender have also been analyzed (Fig. 6). In the interval 35–50 years, 100% of

![Fig. 4 - Patient's data.](image1)

![Fig. 5 - Overall preference, according to disease severity and patients receiving multiple treatments.](image2)

![Fig. 6 - Preferences according to patient's age and gender.](image3)
patients choose the theatre ($p = 0.072$); in patients aged 51–65 years, 55.6% choose the day hospital and 44.4% choose the theatre ($p = 1.000$); in patients aged 66–80 years, 53.3% choose the day hospital and 30.0% choose the theatre ($p = 0.322$) and in patients older than 80 years, 53.8% choose the day hospital and 38.5% the theatre ($p = 0.923$). Women who choose the day hospital account for 45.5% and those who choose the theatre account for 45.5%; percentages in men are 52.9 and 32.4%, respectively ($p = 0.401$).

Only two interviewed patients are not independent for activities of daily living; one of them prefers the theatre and the other one has no preference.

In the analysis of the reasons for choosing the day hospital, the most frequent is the quicker service (16 cases), followed by comfort (6) and the fact that they do not need to change clothes or have an intravenous catheter placed (6).

In patients who prefer the theatre, some of the reasons that stand out are the treatment and professionalism perceived and the care received in 12 cases; more comfort in 2 cases and better facility conditions (1), safety (1) and asepsis (1).

Considering the overall satisfaction, 87.5% of patients are satisfied or very satisfied with the day hospital and 91.1% with the theatre ($p = 0.727$) (Fig. 7).

In the different health care characteristics studied, both in the day hospital and the theatre, a percentage equal to or greater than 75.0% of patients are very satisfied or satisfied. In all the assumptions, three users or less are very dissatisfied or dissatisfied. In the following items, there has been a better rating of the theatre: treatment by the administrative staff ($p = 0.031$), treatment by the nursing staff ($p = 0.018$), information received ($p = 0.08$) and cleanliness ($p = 0.018$). In the rest of the items, no significant differences were detected (Table 1).

Among the patients who choose the day hospital, the percentage of patients satisfied or very satisfied with the waiting time is 77.7% in relation to the day hospital and 70.4% ($p = 0.534$) in relation to the theatre, and among those who choose the theatre, the percentages decrease to 57.1 and 66.7%, respectively ($p = 0.525$) (Fig. 8).

**Cost analysis**

Costs derived from the procedure are analyzed, taking the following into account: cost of staff, cost derived from the use of the facilities, material used and drug(s).

<table>
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<th>Table 1 – Number and percentage of satisfied or very satisfied and dissatisfied or very dissatisfied patients.</th>
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The difference between day hospital and theatre lies in the staff involved in each location where the injection is administered. Both the drug and the material used have the same characteristics. However, although the injection at the day hospital is administered with the aid of a nurse or ancillary staff in charge of preparing the patient and helping the physician during the procedure, at the theatre, due to the set circuits, the intervention of the preoperative nursing staff, ancillary staff and theatre nursing staff, and Internal transport and Ancillary management staff who take the patient from the preoperative care unit to the theatre is required given that, although they are close, they are not adjacent like at the day hospital.

Safety analysis

From all the interventions performed, only mild adverse effects related to the injection have been reported on three occasions: two cases of mild anterior uveitis and one case of retinal pigment epithelium (RPE) detachment that did not lead to any additional loss of vision. Uveitis may be caused by both the procedure itself (invasive) as well as a reaction to the administered drug. RPE detachment may occur spontaneously as a result of the underlying disease’s natural course (AMD with a high RPE detachment).

No serious side effect (endophthalmitis, retinal detachment, vitreous haemorrhage) was reported during the study period.

Discussion

Interviewed patients’ cooperation has been very high: no patient refused to fill in the survey. This could be due to the treatment characteristics (which include very frequent check-ups, thus making physician–patient relationship increasingly stronger) or due to the organization of the injection consultation room in our service, with a specific unit for this disease to which the patient may be referred practically from the first visit and where all the follow-up process is carried out, all of which is basically performed by the same physician.

In the distribution as per ages, the 66–80 years interval stands out, given that most of the studied diseases predominate in elderly patients. Although the prevalence of AMD increases with age, when other diseases are included in the study, such as myopic neovascularization (typical in younger patients), the overall mean age is not so high.

In this article, there are more men, although in most studies on AMD prevalence there is a higher percentage of women. According to literature, the existence of a relationship between the disease and the patient’s gender is unclear; therefore, it could be biased by the longer life expectancy.2,3

The most prevalent disease in the macula clinic is AMD; this is the reason why most of the interviewed patients have this disease.

Overall assessment and that related to the analyzed items are in favour of injection administered at the theatre, despite the fact that a higher percentage of patients prefer the day hospital. This could be related to a higher subjective weighting by the patient regarding the waiting time compared to other characteristics analyzed and not to a perceived quality problem.

No differences between AMD and the rest of the studied diseases are observed regarding the percentage of patients that choose the day hospital, but conclusions cannot be reached in relation to other diseases due to the smaller number of patients.

In patients with more severe stages of the disease, the theatre is selected as the first option, which could be explained by their visual impairment that makes wandering around unknown places difficult. However, patients who have received multiple injections prefer day hospital comfort and quicker service.

Older patients do not show preference for the theatre. This could be due to the predominance of patients who are independent for activities of daily living. A higher percentage of patients in the 66–80 years interval (the most prevalent) show preference for the day hospital compared to the theatre setting.

There is a higher percentage of women who choose the theatre compared to men, although both genders are inclined to choose the day hospital.

According to the collected data, patients consider that the day hospital is more comfortable and provides quicker service, because they do not need to change clothes or to have an intravenous catheter placed. Time spent there is shorter because the day hospital also has a waiting room adjacent to the injection location.

It should be noted that, even though the quicker service is the reason why more patients choose the day hospital, the number of patients satisfied or very satisfied with the waiting time is approximately 70%, and, additionally, it increases to 95% if we consider the neither satisfied nor dissatisfied range also. This could be due to a wrongly asked question, to a different interpretation (for example, the waiting time in the room or in the preoperative room, which is similar in both locations, given that the difference lies in patient preparation and transfer) or because the patient considers that the waiting time is “normal.”

All these data enable us to reflect on suitability of the intravitreal injection in one location or the other. If there is no medical contraindication (for example, hypertension or poorly controlled hypertension), the injection administered in a dedicated injection room maintains an adequate health care quality and leads to reduced costs by using less human resources, and is also time saving for the patient and his/her family members. However, other factors should be taken into account, such as mobility, comorbidity and the eye disease severity suffered by patients with poor VA, which could determine, especially in the most serious cases, the preference for a location where they do not have to move by themselves, even though this implies longer waiting time.

Costs derived from injections have not been broken down, but the difference in favour of the use of a dedicated injection room compared to the theatre setting seems to be established, considering only financial data, because of the saving in human resources.

Although this study has not been carried out to obtain safety data, given that both the day hospital and the theatre
setting follow the same asepsis protocol for intravitreal injections, if there were differences regarding the occurrence of endophthalmitis, they could be attributed to the analyzed area, once the risk adjustment has been performed. Given the lack of serious side effects, it could be deduced that it is not necessary to perform the intravitreal injection procedure in a theatre setting, since the injection in a room equipped with material and the compliance with the established protocol do not seem to increase the intraocular infection rate.

Therefore, there are many factors to take into account when choosing a location for intravitreal injection. Firstly, safety; as mentioned above, the literature does not include any express recommendations on this matter, provided that it is carried out in a place where the minimum asepsis conditions can be maintained. Patient’s preferences should also be taken into account, if possible; several characteristics that affect patients’ choice, such as disease severity or the degree of visual involvement, have been described. One should not forget, least in the current context, the economic aspects, which may vary according to the use of human resources. Lastly, it is important to have in mind the organizational aspects, since not all health centres have the same facilities or the same accessibility.

Both the day hospital and the theatre setting are locations positively rated by users. Except for the analysis of the waiting time, where slightly poor results are obtained, the rest of the clinical care factors analyzed have been highly favourable.

In general, patients prefer injection in a dedicated injection room since the most praised attribute when deciding on their preferences is waiting time. In certain cases of serious eye disease, a change in patient’s choice in favour of the theatre setting may be expected.

Costs associated with human resources can be reduced when the procedure is performed in the day hospital.

No data were obtained suggesting that intravitreal injections given in a dedicated injection room different from the theatre setting are not recommended in relation to safety issues. However, a categorical statement cannot be made based on the study data.

**Conflicts of interest**

The authors declare that they do not have any conflicts of interest.

**Acknowledgments**

We thank the Ophthalmology Service, Statistics Service, the surgical team and the day hospital staff of the Hospital Universitario Infanta Cristina for their excellent daily work, without which we would not have been able to prepare this article.

**References**