

Assessment of visual acuity improvement in patients with AMD referred to the low vision department

Avaliação da melhora da acuidade visual em pacientes com DMRI encaminhados ao setor de visão subnormal

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ABSTRACT

Purpose: To evaluate the vision improvement through the use of visual aids of patients with Age-Related Macular Degeneration (AMD) those were examined in the low vision department. **Methods:** A retrospective study was conducted by reviewing medical records of 61 patients with AMD who were referred to the Low Vision Department from January 2012 to December 2014. The data collected included age, sex, diagnosis of the type of AMD and previous use of vascular endothelium growth factor inhibitor or antioxidants. In addition, far acuity, with and without optical aid, was indicated as well as which aid was prescribed. **Results:** In this study with 61 patients, 54.1% were male and 45.9% female. The most prevalent age group was 71-80 years old (44.3%) and most of the patients had the dry form of AMD (70.5%). With the use of visual aids, 73.8% of the patients improved visual acuity for far vision. The most prescribed optical aid was the Galileu 2.8x telescope (50.8%). **Conclusion:** Patients with visual impairment and AMD can benefit significantly from the visual aids if they are properly prescribed and fitted. Most patients in the study were fitted with at least one of the indicated visual aids, resulting in a significant improvement in far acuity.

Keywords: Vision, low; Vision disorders; Macular degeneration; (4) Audiovisuals aids; Visual acuity

RESUMO

Objetivo: Avaliar a melhora da visão através de auxílios visuais em pacientes portadores de Degeneração Macular Relacionada a Idade (DMRI) encaminhados ao serviço de visão subnormal. **Métodos:** Foi realizado um estudo retrospectivo, através da revisão 61 prontuários de pacientes com diagnóstico de DMRI que foram encaminhados ao departamento de Visão Subnormal (VSN), no período de janeiro 2012 a dezembro de 2014. Foram coletados dados sobre idade, sexo, diagnóstico do tipo de DMRI e uso prévio de inibidor do fator de crescimento do endotélio vascular (anti-VEGF) ou antioxidante. Além disso, outras informações foram colhidas como acuidade visual para longe sem auxílio e com auxílio óptico, indicando o(s) auxílio(s) óptico(s) prescrito(s). **Resultados:** Dos 61 pacientes avaliados, 54,1% eram do sexo masculino e 45,9% do sexo feminino. A faixa etária mais prevalente foi de 71-80 anos (44,3%) e a maioria (70,5%) apresentava a forma seca de DMRI. Com o uso de recursos visuais, 73,8% dos tiveram melhora da acuidade visual para longe. O auxílio óptico mais prescrito foi o telescópio do tipo Galileu 2,8x (50,8%). **Conclusão:** Pacientes com deficiência visual e DMRI podem se beneficiar significativamente dos recursos visuais se esses forem devidamente indicados e adaptados. A maioria dos pacientes aceitou pelo menos um dos recursos visuais indicados resultando numa melhora importante da acuidade visual de longe.

Descritores: Baixa visão; Transtornos da visão; Degeneração macular; Recursos audiovisuais; Acuidade visual

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INTRODUCTION

Age-related macular degeneration (AMD) is the leading cause of blindness in the population over the age of 55 and its prevalence increases with age affecting about 8.5 to 27.9% of the population over the age of 75.⁽¹⁾ These data point to the great impact of this disease on public health, becoming especially relevant with the increasing longevity observed in recent decades.

Currently, there is no treatment that targets the primary cause of visual loss in AMD and the current strategy of available treatments aims to stabilize and, at best, achieve marginal improvement of vision. Therefore, there is a great demand for low-vision aids in the elderly population with AMD despite of its existing therapies.⁽²⁾ Therefore, the subnormal vision department appears as a great aid to optimize the individual's visual residue with the use of optical resources.⁽³⁾

The objective of this study is to evaluate the improvement of vision through visual aids in patients with ARMD who are referred to the low vision service of the Benjamin Constant Institute.

METHODS

A retrospective study was carried out through a review of 61 medical records of patients with a clinical diagnosis of AMD by the Department of Retina, who were referred to the Department of Low Vision (VSN) of the Benjamin Constant Institute, Rio de Janeiro, from January 2012 to December 2014.

The diagnosis of AMD was established after detailed ocular examination and results of fluorescein angiography and optical coherence tomography. Ocular examination included measurement of visual acuity by the Snellen table for distance and use of the Jaeger's table for close, refraction, biomicroscopy of the anterior segment, stereoscopic retinal evaluation and examination with the Amsler table.

For the diagnosis of AMD, a consensus from the American Academy of Ophthalmology was used⁽⁴⁾: (a) No AMD (AREDS category 1): none or few small drusen (less than 63 microns in diameter); (b) Early AMD (AREDS category 2): combination of multiple small drusen, few intermediate (63 to 124 microns in diameter), or EPR abnormalities; (c) intermediate ARMD (AREDS category 3): extensive intermediate drusen, at least one large druse (greater than or equal to 125 microns in diameter) or geographical atrophy not involving the center of the fovea; (d) Advanced AMD (AREDS category 4): characterized by at least one of the following characteristics (without other causes): geographical EPR and choriocapillary atrophy involving the center of the fovea; or exudative AMD (neovascular maculopathy), defined as: choroidal neovascularization; serous or hemorrhagic detachment of the neurosensory retina or EPR; lipid exudates (secondary phenomenon of vascular extravasation from any source); subretinal fibrovascular proliferation or sub-EPR; disciform scar. Therefore, AMD can be classified as dry (drusen and EPR alterations) or exudative (neovascular maculopathy).

To be referred to the VSN department, patients needed to be placed in the subnormal vision diagnosis. According to the tenth review of the International Statistical Classification of Diseases and Related Health Problems (ICD-10)⁽⁵⁾, subnormal vision or low vision is considered when the value of the corrected visual acuity in the best eye is less than 0,3 and greater than or equal to 0,05 or its visual field is less than 20 degrees in the best eye with

the best optical correction, and blindness is considered when those values are below 0,05 or the visual field is smaller than 10 degrees.

In the VSN department records, the following data were collected: age, gender, diagnosis of AMD type and previous use of anti-VEGF or antioxidant. In addition, other information was collected such as visual acuity without aid and with optical aid, indicating the prescribed optical aid(s). Long-distance visual acuity was measured using the ETDRS (Early treatment diabetic retinopathy study) table.

The patients were placed at a distance of 3 meters from the orthotypes of the ETDRS table. Visual acuity ratings were made in logMar units (before and after the use of optical aids).

The magnifying video systems are types of visual aids used in the VSN department. However, unlike visual acuity measurement by the ETDRS table, it is not possible to measure the visual acuity with this feature, making it impossible to compare visual acuity before and after this feature. Thus, the number of patients with indication of such was noted but visual acuity with the use of them was not evaluated.

The inclusion criteria were: 1) Clinical, angiographic and tomographic diagnosis of AMD using the consensus of the American Academy of Ophthalmology by the Department of Retina 2) Be a subnormal viewer by the definition of the Brazilian Society of Nervous System 3) Main cause of low vision attributed to AMD. In cases where other associated low visual causes could also contribute to low vision, detailed investigations were performed to confirm the major cause of low vision. Patients with poor vision due to any cause other than AMD were not included in the study.

In the admission to the VSN department, according to visual acuity with distance correction before adaptation of the visual resources, patients were classified into groups according to the categories of visual impairment defined by the World Health Organization (WHO) in 2003.⁽⁵⁾

For the comparative analysis of visual acuity from afar, the Student's t test was used for numerical variables, the chi-square test for categorical variables with a significance level of 95% (p value <0.05).

RESULTS

From January 2012 to December 2014, 61 patients with AMD were treated at the Department of Low Vision (VSN) of the Benjamin Constant Institute. Of these patients, 33 (54.1%) were male and 28 (45.9%) were female. As for the age group, 3 (4.9%) were 60 years old or less, 13 (21.3%) were between 61-70 years of age, 27 (44.3%) were between 71-80 years of age, and 18 (29.5%) were more than 80 years old. The average age was 76.4 years.

Among the forms of AMD, 43 patients (70.5%) had a dry form and 18 (29.5%) had an exudative form. When asked about the use of previous treatments, 51 subjects (24.6%) had previously used anti-VEGF and 31 (50.8%) used some oral antioxidant.

According to visual acuity for distance at the admission in the VSN department, patients were classified into 3 groups following the criteria of visual impairment defined by the WHO. Therefore, 32 patients (52.5%) had moderate visual impairment, 13 (21.3%) had severe visual impairment, and 16 (26.2%) had a definition of blindness. Of the total of 61 patients evaluated, all were evaluated regarding the use of visual resources for distance. However, for 12 patients (19.7%) the resource was not prescribed due to lack of improvement in visual acuity or lack of motivation on the part of the patient.

With the use of the visual resource, 45 of the 61 patients (73.8%) obtained some degree of improvement in their AV for

distance. The average visual acuity, in logMar, was 1.08 with pre-adaptation of visual resources and 0.79 logMar after adaptation (p value <0.05)

In relation to the adapted visual resources, the Galileo 2,8x telescope was prescribed for the 31 patients (50.8%), for 17 patients (27.9%), the Kepler 4x12 type telescope was prescribed, for 12 patients (19.7%) the Galileo binocular telescope, and for 1 patient (1.6%) the Kepler 6x16 telescope was prescribed (Figure 1). The use of video magnification system was indicated for 23 of the 61 patients in the study (37.7%).

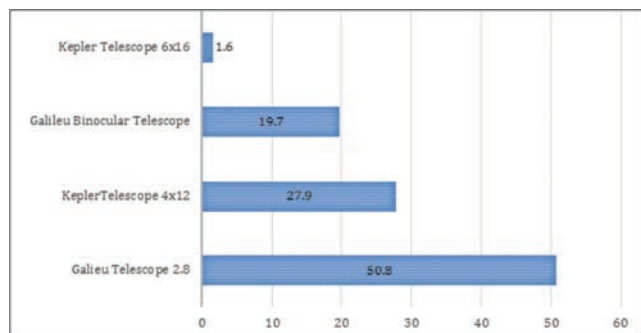


Figure 1: Distribution of the types of optical resources used for distance.

DISCUSSION

Age-related macular degeneration is the leading cause of blindness in the Western world in age groups over 55 years of age. Despite the advances, the treatment of AMD has limitations and affected patients are often referred to the visual rehabilitation services to assist them in the use of visual residual. The prevalence of visual impairment increases dramatically with age. The average age found in this study was of 76.4 years, with the majority (44%) being 71-80 years old. In other studies, average age values of 81.4 years (6), 72 years⁽⁷⁾, 68.2 years⁽⁸⁾, and 69,2 years were found.⁽²⁾ The average age may vary according to the life expectancy of the study population, taking into account the living conditions of the city/country and access to the health services in these places.

Regarding gender, in our study there was a slight male prevalence (54.1%). Christoforidis et al.⁽³⁾ evaluated a group of 100 patients with AMD, 73% of them were male. De-Zheng et al.⁽⁸⁾ evaluated fourteen patients with AMD where twelve of them were male and two female. However, in most studies there is a high prevalence of females, and some studies suggest that a possible explanation for this would be the greater survival of women and the fact that they consult doctors, including ophthalmologists, more often than men. However, despite the high prevalence of females in most studies, there appears to be no significant relationship between AMD and gender.⁽⁹⁾

Regarding the forms of presentation of AMD, in our study, 43 patients (70.5%) were diagnosed with the dry form and 18 patients (29.5%) with the exudative form. Christoforidis et al.⁽³⁾ found a similar result in which 66% of the patients were diagnosed with dry AMD and 34% with exudative AMD. Arroyo et al. points to a somewhat higher proportion of the dry form, with 85-90% of patients with this form and only 10-15% with the exudative form.⁽¹⁰⁾

Of the total of 61 patients evaluated in our study, the Galileo 2.8x was the type optical resource for distance that was most subscribed, which was used for 31 patients (50.8%). Nilsson et al.⁽⁷⁾ 120 patients with advanced AMD, who were studied for an average

of 5 years (± 3 years), and were evaluated that the telescopes were also the most used aids for distance, having an average increase of 4.6x. Lucas et al.⁽¹¹⁾ demonstrated that 20% received some aid for distance and the type that was most indicated was the telescope type Galileo 2,5x (100.0%).

Of the 61 patients that adapted some optical device for distance, 45 of them (73.8%) obtained some degree of improvement of their VA. Fourteen patients (23.0%) obtained final visual acuity after utilizing resources above 0.3. De-Zheng et al.⁽⁸⁾ showed that visual acuity for distance improved with the use of optical resources in 24 of 25 eyes (95% of cases) and 12 eyes (48%) achieved visual acuity equal to or better than 0.4.

Nilsson et al. a follow-up of 120 patients with AMD was made and users of visual aids⁽⁷⁾ also demonstrated that the rehabilitation of patients with age-related macular degeneration through optical aids was extremely successful.

Video magnification systems are other resource options for visually impaired patients. In our study, for 23 of the 61 patients (37.7%), the use of video magnification system was recommended. Electronic systems have the great advantage over lenses to allow reading for almost all levels of visual acuity. In addition, there is the added benefit of preserving binocularity, even with high levels of visual disparity between the two eyes.⁽³⁾ Although we cannot perform the comparison of visual acuity before and after this feature for evaluation in our study, Ducrey et al.⁽¹²⁾ performed the follow-up of 42 patients who had the AMD diagnosis and made use of visual aids. The resources that obtained the best results regarding the degree of patient satisfaction were the electronic magnification systems.

Contrast is one of the items that can be improved through the use of electronic devices. By enlarging the font print of the letters and images, these devices allow the individual to adjust the contrast to their preference.⁽¹³⁾ Consequently, the reading speed may be faster and the reading time may be longer. However, unfortunately, these systems are still very expensive for most users.⁽¹⁴⁾

It is important to know that there are intrinsic limitations for each type of optical resource, and that it will not offer the patient the same quality of vision as a person without ocular pathologies. Telescopes, for example, while having the advantages of being available for long, intermediate and short distances, and allowing for a retinal image enlargement, they produce a visual field reduction and decrease the illumination of the image on the retina. Factors inherent in the aid itself (appearance, cost, complexity) also present difficulties in the use of resources.

In addition, other visual functions such as contrast sensitivity, visual field and color vision are also known to be indispensable factors for good visual performance. However, often an improvement, even in a small degree, in the patients' functional vision, already modifies their daily life, allowing them greater autonomy. Bischoff et al.⁽⁶⁾ evaluated the long-term results of 112 patients with AMD, 57 patients (51%) reported that the resources for visual rehabilitation made them more independent and about 75% of them still use these resources 1-5 years after its first prescription. The independence, however small, that a person may acquire with the use of visual aids goes far beyond basic personal needs such as hygiene, food, home care, and social activities. It means developing self-confidence and valuing one's own abilities, thus facilitating their reintegration into society and improving their quality of life.

CONCLUSION

A comprehensive multidisciplinary approach, including the appropriate education / counseling of professionals and patients,

and individualization of resource adaptation and training is of utmost importance in the overall management of patients with AMD. A larger prospective study is needed to clearly demonstrate the impact on patients' quality of life. However, this study clearly demonstrates that many patients with low vision due to AMD could benefit significantly from low vision resources.

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