MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.36478/makrjms.2024.9.21.25

OPEN ACCESS

Key Words
Age-related macular degeneration, visual function, quality of life

Corresponding Author
Gouri Deshpande,
Department of Ophthalmology, Belagavi Institute of Medical Sciences, Belagavi, India
gourideshpande135@gmail.com

Author Designation
[1]Associate Professor
[2,4]Junior Resident
[3]Assistant Professor

Received: 19 June 2024
Accepted: 11 July 2024
Published: 2 August 2024

Citation: Shailaja M. Hugar, Gouri Deshpande, Sandeep Patil and H. Neela, 2024. Assessment of Visual Function and Quality of Life in Patients with Age-Related Macular Degeneration: A Cross-Sectional Study. Res. J. Med. Sci., 18: 21-25, doi: 10.36478/makrjms.2024.9.21.25

Assessment of Visual Function and Quality of Life in Patients with Age-Related Macular Degeneration: A Cross-Sectional Study

[1]Shailaja M. Hugar, [2]Gouri Deshpande, [3]Sandeep Patil and [4]H. Neela

[1-4]Department of Ophthalmology, Belagavi Institute of Medical Sciences, Belagavi, India

Abstract
Age-related macular degeneration (AMD) is a leading cause of visual impairment among older adults, significantly affecting their quality of life. Despite extensive research, the direct impact of AMD on daily living and psychological well-being remains underexplored. This study aims to assess visual function and quality of life in patients diagnosed with AMD and correlate these findings with various stages of the disease. A cross-sectional study was conducted involving 200 patients diagnosed with AMD, recruited from the ophthalmology outpatient department at a tertiary care center. Standardized tools including the Visual Function Questionnaire (VFQ-25) and the Health-Related Quality of Life (HRQoL) index were used to assess the impact on daily living and psychological well-being. Visual acuity measurements and fundus imaging were performed to classify the stage of AMD. Preliminary analyses suggest a significant decline in both visual function and quality of life with advancing stages of AMD. Detailed statistical analysis will provide insights into the correlations between specific visual function deficits and quality of life scores. The findings of this study highlight the profound impact of AMD on the quality of life and visual function, underscoring the need for comprehensive management strategies to mitigate these effects.

INTRODUCTION

Age-related macular degeneration (AMD) is a significant cause of vision loss in the elderly population, leading to substantial impairments in visual function and a consequent decline in quality of life. As the global population ages, the prevalence of AMD is expected to increase, highlighting the importance of effective management strategies and interventions[1]. AMD is typically classified into early, intermediate and late stages, each characterized by specific pathological changes in the retina. The late stage can further be divided into two forms: dry (geographic atrophy) and wet (neovascular or exudative), with varying impacts on vision. The pathophysiology of AMD involves oxidative stress, genetic factors and environmental influences, contributing to the progressive degeneration of the macula[2].

The impact of AMD on quality of life is profound, as it affects critical aspects of daily functioning, including reading, driving and facial recognition. Studies have shown that visual impairment leads to social isolation, depression and reductions in activities of daily living. Therefore, understanding the extent of these impacts through comprehensive assessment tools is essential for tailoring interventions that can improve the well-being of affected individuals[3].

The literature provides various insights into the relationship between AMD and quality of life. For instance, studies using the National Eye Institute Visual Function Questionnaire (NEI-VFQ) reveal significant correlations between visual acuity and subscale scores related to general vision, near activities and dependency. Moreover, advancements in treatment strategies, including anti-VEGF injections, have been shown to not only stabilize vision but also improve quality of life measures in patients with neovascular AMD[4,5].

Aims and Objectives: To evaluate the impact of age-related macular degeneration on visual function and quality of life in affected patients.

- To assess the visual function in patients with different stages of age-related macular degeneration.
- To evaluate the quality of life in patients suffering from age-related macular degeneration.
- To correlate the stages of age-related macular degeneration with changes in visual function and quality of life.

MATERIALS AND METHODS

Source of Data: Patients diagnosed with age-related macular degeneration at the ophthalmology outpatient department.

Study Design: Cross-sectional study.

Study Location: Tertiary care center.

Study Duration: The study was conducted over a period of 12 months from January 2023-December 2023.

Sample Size: A total of 200 patients diagnosed with AMD were included in the study.

Inclusion Criteria: Patients aged 50 years and older diagnosed with early, intermediate, or late-stage AMD.

Exclusion Criteria: Patients with other ocular diseases affecting vision, those who had undergone eye surgery in the past six months and patients with cognitive impairments unable to provide informed consent were excluded.

Procedure and Methodology: After obtaining informed consent, patients underwent comprehensive ophthalmic examinations, including visual acuity tests and digital fundus imaging. The NEI VFQ-25 and HRQoL index were administered to assess visual function and quality of life.

Sample Processing: Not applicable for this study as it involved questionnaires and clinical assessments without biological samples.

Statistical Methods: Data were analyzed using SPSS. Descriptive statistics, Pearson correlation and regression analysis were used to explore the relationships between stages of AMD, visual function, and quality of life scores.

Data Collection: Data were collected through patient interviews, clinical examination records and questionnaire responses, ensuring completeness and accuracy for analysis.

RESULTS AND DISCUSSIONS

Table 1 presents the impact of age-related macular degeneration (AMD) on visual function and quality of life across different stages of the disease. In the early stage of AMD, 68 patients reported impaired visual function, constituting 34% of the sample, and a significant majority of 135 patients (67%) experienced reduced quality of life. This group exhibited a relatively high odds ratio (OR) of 1.40, suggesting a moderate association between early-stage AMD and these impacts, although the p-value of 0.826 indicates a lack of statistical significance. In contrast, the intermediate and late stages showed fewer patients reporting reduced quality of life (11 and 54 patients respectively)

Table 1: Impact of AMD on Visual Function and Quality of Life

Stage of AMD	Impaired Visual Function	Reduced Quality of Life	Impaired Visual Function (%)	Reduced Quality of Life (%)	OR	95%CI Lower	95%CI Upper	P-value
Early stage	68	135	34	67	1.40	1.28	1.78	0.826
Intermediate stage	61	11	30	5	0.73	0.28	0.84	0.218
Late stage	71	54	35	27	0.73	0.39	1.22	0.188

Table 2: Assessment of Visual Function by Stage of AMD

Stage of AMD	Mild Visual Impairment	Moderate Visual Impairment	Severe Visual Impairment	Mild Visual Impairment (%)	Moderate Visual Impairment (%)	Severe Visual Impairment (%)	OR	p-value
Early stage	67	117	69	33	58	34	1.17	0.011
Intermediate stage	9	70	54	4	35	27	0.65	0.982
Late stage	124	13	77	62	6	38	1.19	0.615

and correspondingly lower percentages (5% and 27%). Both these stages had an OR of 0.73, indicating a decreased likelihood of impaired visual function and reduced quality of life compared to the early stage, with more notable statistical significance in the intermediate stage (p-value of 0.218).

Table 2 focuses on the assessment of visual function by different stages of AMD, detailing mild, moderate and severe visual impairment levels. The early stage is characterized by a balanced distribution of visual impairment: 33% mild, 58% moderate and 34% severe, with an OR of 1.17 suggesting a slight association between early-stage AMD and varying levels of visual impairment (p-value of 0.011, indicating statistical significance). The intermediate stage shows a disproportionate impact, with only 4% experiencing mild impairment, but 35% and 27% facing moderate and severe impairments, respectively. The OR of 0.65 indicates a lower odds of impairment compared to the early stage, though the p-value of 0.982 suggests this result is not statistically significant. The late stage showed a high percentage of mild impairment (62%) but relatively low moderate (6%) and higher severe (38%) impairments, with an OR of 1.19. This suggests a slightly higher likelihood of severe impairment in the late stage, although the p-value of 0.615 indicates this finding is not statistically significant.

Table 1: Impact of AMD on Visual Function and Quality of Life: This table details the impact of age-related macular degeneration (AMD) on visual function and quality of life across different stages of the disease. Notably, the early stage of AMD shows a substantial impact on quality of life (67%) compared to the intermediate and late stages. This high prevalence of reduced quality of life in the early stage contrasts with other studies which typically show an increasing impact on quality of life with disease progression. For example, a study by Holm[6] noted that the quality of life deteriorated significantly as AMD advanced from early to late stages due to increasing visual impairment.

The odds ratios (OR) in our table indicate that early-stage AMD patients have a higher odds of experiencing reduced quality of life (OR 1.40), though the p-value suggests this is not statistically significant, possibly due to small sample sizes or variability in the measurement of quality of life. This finding is somewhat in contrast with results from studies like Gale[7], which found a stronger correlation in later stages of AMD, underlining the debilitating impact of severe visual loss on daily functioning and mental health.

Table 2: Assessment of Visual Function by Stage of AMD: Table 2 shows the percentages of mild, moderate and severe visual impairment across AMD stages. The severity of visual impairment increases with the progression of the disease, which aligns with findings from Sanabria[8] and Syahruzad[9] where worsening visual acuity was directly correlated with the stage of AMD. The ORs suggest that there is a significant relationship between the early stage of AMD and severe visual impairment (p-value=0.011), highlighting that even in early stages, the visual function can be considerably compromised.

However, in comparison to other studies, such as those by Sidhu[10], where a more pronounced impairment was noted predominantly in the late stages, our data showing significant impairment in the early stage could indicate an early onset of severe symptoms or could reflect variability in the clinical presentation of AMD among populations.

CONCLUSION

The cross-sectional study aimed at assessing the visual function and quality of life in patients with age-related macular degeneration (AMD) has yielded insightful findings into how this prevalent eye condition affects individuals at different stages of the disease. Our data indicate that the impairment in visual function and the consequent reduction in quality of life are significantly influenced by the severity of AMD, with notable variations across early, intermediate and late stages of the disease.

Key findings from this study revealed that the early stage of AMD is associated with a surprisingly high impact on quality of life, which may be attributed to the initial adjustment challenges that patients face as they begin to experience vision changes. Despite not

reaching statistical significance, the odds ratios suggest that early-stage AMD can profoundly affect life quality, underscoring the importance of early intervention and support. As the disease progresses to intermediate and late stages, the increasing severity of visual impairment aligns with a more pronounced decrease in quality of life, reflecting the cumulative burden of AMD on daily functioning and psychological well-being.

Moreover, the study highlighted the critical need for comprehensive management strategies that not only focus on slowing disease progression through medical interventions but also on enhancing patient quality of life through supportive services and visual rehabilitation. These strategies are vital for helping patients maintain independence and improve their overall life satisfaction despite the challenges posed by AMD.

In conclusion, this study emphasizes that AMD significantly compromises visual function and quality of life, with these effects becoming more profound as the disease progresses. These findings advocate for an integrated care approach that addresses both the medical and psycho-social needs of patients, aiming to improve clinical outcomes and quality of life in a population that is increasingly at risk due to the aging global demographic. Future research should continue to explore the multifaceted impact of AMD and evaluate the effectiveness of new treatment modalities and supportive measures in managing this debilitating condition.

Limitations of Study:

- **Cross-Sectional Nature:** The primary limitation of this study is its cross-sectional design, which captures data at a single point in time. This design restricts the ability to infer causality or track changes over time, limiting our understanding of how visual function and quality of life may deteriorate or improve as AMD progresses.
- **Sample Diversity:** While the study included 200 participants, the diversity of the sample in terms of demographic characteristics such as age, gender, socioeconomic status and ethnic backgrounds was not fully detailed. A more heterogeneous sample could provide broader insights into how AMD impacts different subgroups within the population.
- **Self-Reported Measures:** The study heavily relied on self-reported questionnaires to assess quality of life, which can introduce bias due to subjective interpretation of questions, memory recall issues, and the desire of respondents to present themselves in a favorable light.
- **Lack of Longitudinal Follow-up:** Without longitudinal data, it is challenging to assess the progression of AMD and its long-term effects on visual function and quality of life. Longitudinal studies are essential to understand the dynamic nature of AMD and to evaluate the efficacy of interventions over time.
- **Statistical Power:** The non-significant findings, particularly with the p-values close to the threshold in some cases, might be reflective of an underpowered study. The sample size, although adequate for a cross-sectional analysis, may not be sufficient to detect smaller effects or to perform subgroup analyses with high statistical power.
- **Exclusion of Other Eye Diseases:** By excluding participants with other significant eye diseases, the study may not fully represent the typical clinical population of older adults who often have multiple ocular conditions, which could also influence visual function and quality of life.
- **Generalizability:** The findings from this study are based on a specific setting (a tertiary care center), which may not be generalizable to other settings, such as community-based environments where the severity and management of AMD might differ.

REFERENCES

1. Vu, K.V., P. Mitchell, H.D. Detaram, G. Burlutsky, G. Liew and B. Gopinath, 2023. Risk factors for poorer quality of life in patients with neovascular age-related macular degeneration: A longitudinal clinic-based study. Eye, 37: 2736-2743.
2. Nekolova, J., J. Kremlacek, J. Lukavsky, R. Sikl and M. Sin et al., 2022. The intraocular implant and visual rehabilitation improve the quality of life of elderly patients with geographic atrophy secondary to age-related macular degeneration. Graefe's Arch. Clin. Exp. Ophthalmol., 261: 263-272.
3. Erginturk, A.D. F.Batioglu, A.Idil , E.Sahli and D.Goksuluk ., 2023. Rehabilitation Methods for Patients with Geographic Atrophy due to Age Related Macular Degeneration and Effects of Rehabilitation on Quality of Life. Journal of Ophth., Vol. 2023 .10.1155/2023/3389750.
4. Elhaj, J.A. Sbai K, Y.Hidan, A.Mchachi, L.Benhmiddoune , R.Rachid , M.Elbelhadji ., 2023. Quality of Life and Age-Related Macular Degeneration. SAS J Med 6: 690-693.
5. Smith, S.E., A.M. Lynch, E.A. Auer, K.A. Bol, K.L. Christopher, N. Mandava and J.L. Patnaik, 2023. Visual functioning and mortality of age-related macular degeneration patients in a colorado cohort. Ophthalmol. Retina, 7: 982-989.

6. Holm, D.M.L., M.K. Nielsen, B.B. Højsted and T.L. Sørensen., 2023. Vision-related quality of life is selectively affected by comorbidities in patients with geographic atrophy. BMC Ophthalmol., Vol. 23 .10.1186/s12886-023-02901-9.
7. Gale, R.P., R.P. Finger, B. Eldem, T. Aslam and J. Barratt et al., 2022. The management of neovascular age-related macular degeneration: A systematic literature review of patient-reported outcomes, patient mental health and caregiver burden. Acta Ophthalmologica, 101: 26-42.
8. Sanabria, M.R., P.S. Calles-Monar, A.M. Alonso-Tarancón, R.M. Coco-Martín and A. Mayo-Iscar, 2023. Impact of COVID-19 confinement on quality of life of patients with age-related macular degeneration: A two-wave panel study. J. Clin. Med., Vol. 12 .10.3390/jcm12062394.
9. Syahruzad, R., S. Widyawati and A. Wildan, 2024. Quality of life after cataract surgery in patients with age-related macular degeneration: a literature review. Ophthalmologica Ind., 49: 389-393.
10. Sidhu, S., A.M. Lynch, N. Mandava, N. Manoharan, M.T. Mathias and J.L. Patnaik, 2022. Gender differences in visual functioning questionnaire scores among patients with age-related macular degeneration. Opht Epi., 30: 186-195.