

## THE DIFFERENCE OF QUALITY OF LIFE AND COGNITIVE FUNCTION BETWEEN PATIENTS WITH AND WITHOUT AGE-RELATED MACULA DEGENERATION (AMD)

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### Abstract

**Introduction:** To determine the difference in the quality of life and cognitive function in patients with and without AMD.

**Methods:** This research is an observational analytic study, a prospective cross sectional study with independent t-test statistical analysis.

**Result:** Study samples' total are 66 people selected by consecutive sampling with 33 people in the group with AMD, and 33 people in the group without AMD and each sample must filled the National eye institute Visual Function Questionnaire (NEI-VFQ) and MMSE Questionnaire. The results of the study showed the average age of the group with AMD 68 years and the group without AMD 67 years old. Most of the male sex and residence in denpasar in both groups. Most AMD with the wet type by 60.6 %. On the measurement of quality of life, it showed decreasing in all subscale in the group with AMD compared to the group without AMD with total average 27.2 % and also decreasing in cognitive function measured by MMSE in the group of AMD compared to the group of non – AMD with 6.8%, even though the MMSE score of the groups are within normal limits. All these things stated significant differences ( $p < 0.05$ ) statistically.

**Conclusion:** There are decreasing quality of life and cognitive function in AMD group compared to Non-AMD group which is needed more treatment and screening in the future.

**Keywords:** Age-Related Macula Degeneration,AMD,ARMD,Vitreo-Retina,Macula

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### INTRODUCTION

Age-Related Macular Degeneration (AMD) is the macular disease who can affect loss of central vision for older people.(AAO, 2020)

AMD also as one of world blindness causes with 8.7%. There are two types, dry AMD and Wet AMD which is dry ones is the most common of AMD. (AAO, 2020)

The causes of AMD is still not yet determined but History of smoking and hypertension gives higher risk to become AMD. Main symptoms of AMD are loss of central vision. (AREDS, 2020)

In world, AMD is estimated almost 20-25 million people for suffering and would be 3 times more in the next 30-40 years.(Bhutto, 2014)

For western countries, AMD has become one of main blindness causes. the incidents are also increasing as getting older. (Bhutto, 2014)

AMD itself could make decreasing quality of life in patients. EQUADE study said that decreasing in all subscale of quality of life in AMD patients and getting worse with increasing severity. Yuzawa et al confirmed that quality of life is decreasing on AMD and increasing with ages.(Matamaros, 2015)

Cognitive Function are important thing when you do daily activity. AMD could make fall out cognitive function. Harrabi et al said that cognitive function in AMD group is lower than control group. Rozzini et al also said difference of cognitive function score between AMD group and Non-AMD Group. (Rozzini, 2014)

Decreased quality of life and cognitive function itself can create neurological disorders such as stress, anxiety, dementia and depression. This could be aggravating AMD and the quality of life itself.

In this study, we conducted a study to determine the difference in the quality of life and cognitive function in patients with and without AMD with hypothesis that there is decreasing in quality of life and cognitive function in AMD group which we hope with this study, we can confirm the previous study result and with this study, we can educate doctor to treat thoroughly with such as cooperation with another department .

## METHOD

This study is a prospective cross-sectional study that conducted at Sanglah General Hospital, Denpasar, Bali. This study also was approved by the Institutional Review Board of Udayana University/Sanglah General Hospital, Denpasar Bali. Informed consent was given upon research doing.

The research are made between October 2020 and December 2020 with total subject 66 and divided into 2 groups ( AMD Group and Non-AMD Group).

The inclusion criteria of patients in this study were all patients with ages more than 49, have complete records with macula OCT to determine AMD

diagnose, willing to join research and answer quisioneirre completely.

History of cornea disease, optic neuropathy and another retina disease,History of cataract with grading more than 2 (wisconsin grade)/N2C2P1(LOCS 2 Grade) or visual acuity less than 6/18, History of another lens disease, History of cataract operation with complication, History of Retina Laser and Intravitreal injection more than twelve times, History of amblyopia, History of neurologic and physiologic were excluded from the study which the list are used,we cited from similar study.

Data were collected including age, gender, residence, underlying disease, AMD type, Visual acuity, History of smoking along with National eye institute Visual Function Questionnaire (NEI-VFQ) and MMSE Questionnaire.The quality of Life of both groups was assessed using the questionnaire of the National eye institute Visual Function Questionnaire (NEI-VFQ), which has been translated. The questionnaire assesses the twelve subscale i.e. general health, vision, pain ocular, activities near future, the activities of the far, social function, mental health, the difficulty of the role, dependence, color vision, peripheral vision. While Cognitive Function was also assessed using questionnaire Mini Mental State Exam (MMSE) indonesian version.

Both of them already been validated using validating test with reliability score > 0.7 .

The characteristics and demo figure features were analyzed with descriptive statistics. For statistical comparison between AMD Group and Non-AMD Group, independet t-test was performed. The statistical analyses were performed using SPSS 16.0 for Windows (SPSS, Chicago, IL).

## RESULT

### Characteristic of Samples

The sample of this study are 66 people selected in a consecutive of the population of all patients who come to the clinic RSUP Sanglah who met the inclusion criteria and exclusion.

Table. 1 displays the characteristics of the study sample.

Table 1. Characteristics Of The Study Samples

Variabel	AMD n:33	Non-AMD n:33
Mean Age (Year), <i>Mean</i> ± <i>SD</i>	67,82±7.63	66.55±7.90
Sex, n (%)		
Male	19 (57.6%)	18 (54.5%)
Female	14 (42.4%)	15 (45.5%)
Residency, n (%)		
Denpasar	28 (84.8%)	30 (91%)
Badung	5 (15.2%)	3 (9%)
AMD Type, n (%)		
Wet	20 (60.6%)	-
Dry	13 (39.4%)	-
Hypertension History, n (%)		
Hypertension	22 (66.7%)	10 (30.3%)
Normal	11 (33.3%)	23 (69.7%)
Smoking Habit, n (%)		
Smoking	16 (48.5%)	15 (45.5%)
No. Smoking	17 (51.5%)	18 (54.5%)
Visual Acuity (in 6 meter)		
Best	6/9	6/6
Worse	1/300	6/12

### The difference in the quality of life and cognitive function between patients with and without Age-Related Macula Degeneration

The results of this study showed there was a significant difference ( $p < 0.05$ ) between the two groups in each of the subscales and decreasing in all aspect quality of lifes in AMD group. The significant difference ( $p < 0.05$ ) was also present at the examination of cognitive function with the MMSE between the two groups and also decreasing in cognitive function in AMD group even in little differences. Graphic.1 displays the result.

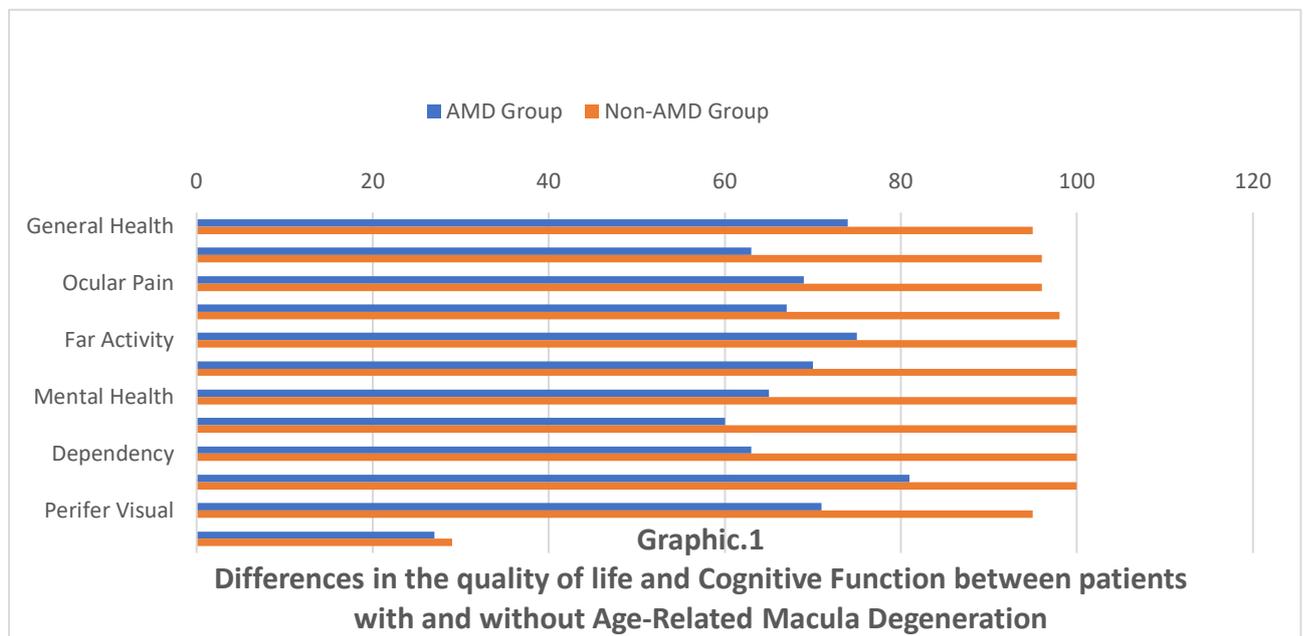
## DISCUSSION

### Characteristic of Samples

AMD is an eye disease degeneration which became the cause of blindness in the world today. It is also recognized by the WHO that AMD became a cause of blindness no. 4 in the world by 8.7%. In Indonesia itself, there is no exact data about the incidence, prevalence and morbidity of AMD until

now. One of the research of the Faculty of Medicine, University of Indonesia period March 2008 - January, 2009 against 1259 responder found the prevalence of AMD reached 4.3 %. The prevalence of AMD is increased as like as increasing age (National Eye Institute, 2019; The Indonesian Ministry Of Health, 2014; Tany, 2016).

In this study, the average age of the group with AMD 68 years and the group without AMD 67 years old. This result is in accordance with the national eye institute that AMD occurs at the age of 60 or more years old and Also did not much different with the prevalence of Deloitte Macular Degeneration Foundation that AMD is increased at the age of 65 years. On research in Indonesia by Tany, et al (2016) gives result that average age on their research between 60-70 years old, same result as Akhmad et al. and Singare et al research. Wong et al also stated the same thing (Akhmad, 2015; Singare, 2015; Wong, 2014).



Some research, likely that done by chungmin et al (2014), Xiang li et al (2014) said that more women suffer from AMD (Chung-min, 2014; Xiang li, 2014). Research in Indonesia by Tany, et al also gives result in line with other research by singare et al showed women more than men in incident of AMD (Tany, 2016; Singare, 2015). But also there are several theories as laitinen et al and Chakravarthy et al said that gender is not be influenced in the incidence of AMD. In this study indicates that prevalence of men more than the women in both groups (with AMD and without AMD) (laitinen, 2010; Chakravarthy, 2010).

Based on the diagnosis of the type of AMD is obtained that patient with wet AMD are common, as many as 60,6%. For dry AMD only achieved as much as to 39.4%. The results of this study differ with the opinion of the Ilyas and Yulianti, as well as the American Optometric Association, which wrote that AMD dry is found in many patients diagnosed with AMD as many as 70-90% compared to AMD wet that only 10% (Sidarta Ilyas, 2014).

At the Level of Visual Acuity, this research

shows that in visual acuity varied from 6/9 to 1/300 and also judging from the degree of severity of AMD itself. At some text book such as AAO, kanski revealed that the visual acuity worsened along with the worsening degrees of AMD itself. Falkenstein et al stated that the average patient vision AMD is the 6/45 with a range of 6/9 to <3/60 (Falkenstein, 2008).

### **The difference in the quality of life and cognitive function between patients with and without Age-Related Macula Degeneration**

Worsening of AMD and Success of a therapy for AMD is strongly associated with adherence and psychological state of the patient itself. AMD even if caused by the age of a threat occurrence of blindness and has already become one of the causes of blindness in the world. Aspects of quality of life and cognitive function for daily life impacted heavily on AMD patients (Yuzawa, 2013; Rozzini, 2014).

The questionnaire NEI-VQF 25 is a tool that can help to make an assessment on the quality of life of the AMD itself (Matamoros, 2015).

MMSE also a tool that gives an overview of cognitive function in patients with AMD (Larner, 2015). Both of those things can help us to early diagnose if there is a loss of quality of life and cognitive function itself.

The results of this study showed the difference score of the subscale on the quality of life where there is a reduction in score in the group with AMD with the average of 27.2 % compared with the group without AMD. It also shows the difference was statistically significant. Decreasing scores in the group with AMD compared to the group without AMD is the score of the subscale general health with 21.5 %, and the sight of the public with 34.5 %, pain ocular where 28,2%, the near activity 31.7 %, far activity with 25%, social function with 29.8 %, mental health 35 %, the difficulty of the role is quite large with 40.5 %, the dependence of the reach 36.9 %, color vision with 18.9 %, peripheral vision with a 24.8 %.

It is also in accordance with the EQUADE study (matamaros, 2015) that in the study they showed a decrease in scores on all subscale of the questionnaire NEI-VFQ 25 for quality of life. It is also in accordance with that described in Yuzawa et al where on AMD provides the decline of quality of life and as a worsening of AMD providing quality of life are more worsening.

In general, Yuzawa et al and matamaros et al also explained the decreasing presence of the quality of life can cause anxiety and cause a severe mental disorder such as stress and depression. The level of stress and anxiety that excess in patients with AMD are also described can increase the degree of AMD itself. This is explained on the abokyi et al where on the animal

model showed oxidative stress high provides an more severity on AMD (Abokyi, 2020).

Besides, it is also influential to measure the success of therapy to everyday life and also help whether or not to use low vision aid. It can also define and give advice to the family as to whether caregiver needs on the patient.

On cognitive function, this study stated that there is a decline of cognitive function in a group with AMD in the form of 6.8 % with The result's score of MMSE in the group with AMD is 27 compared to the group without AMD, namely 29 but in-degree score, it is still within normal limits. It is mentioned in the study harrabi et al, where a score of cognitive function were lower in AMD patients, fuchs dystrophy and glaucoma.

Meanwhile, according to rozzini et al mentioned a decrease in the scores of cognitive function with MMSE i.e. a score of 27 compared to the control 28 however, according to the degree of the score was still within normal limits (Rozzini, 2014).

The need for measurement of early cognitive function be able to prevent or diagnose disease early dementia in patients. This is necessary because dementia can worsen the quality of life of the patient itself which will create a vicious circle in the progression and treatment of AMD. Shi rong et al also stated the presence of the association of dementia with deterioration and increased risk occurrence of AMD (Shi-Rong, 2019).

## CONCLUSION

Conclusion in this study is the presence of significant differences and a decrease in quality of life in the group with AMD by 27.2 % compared to the group without AMD. Significant differences and a decrease was also seen in the study with the assessment of cognitive function in a group with AMD by 6.8 % compared to the group without AMD. The need for measurement of early cognitive function and quality of life would be able to prevent or diagnose neurological disease such as stress, anxiety, dementia and depression that would make severity progression of AMD.

## LIMITATION

The weaknesses of this research are there is a risk occurs recall bias because of the use of the questionnaire and because of the research done in the middle of the pandemic covid, this can affected psychological and mental level of the subject.

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