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## RESEARCH ARTICLE

# RELATIONSHIP BETWEEN ANTIOXIDANT SUPPLEMENTATION AND PROGRESSION OF AGE RELATED MACULAR DEGENERATION

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**ABSTRACT**

**Background:** Age related macular degeneration is the leading cause of visual loss in western population in patients older than 60 years old. As Oxidative stress has been implicated in the etiology of age related macular degeneration, antioxidant supplementation could be of benefit to prevent or slow the progression of this disabling disease.
**Objectives:** The aim of this review is to investigate the relationship between antioxidant supplementation and the progression of age related macular degeneration.
**Methods:** A literature search using Medline database was conducted for the years 1946 to 2017 to explore the relationship between antioxidant supplementation and the progression of age related macular degeneration. The search was restricted to studies published in English language. The first 30 articles were reviewed and five relevant studies were selected in this analysis.
**Results:** Impacts of antioxidants supplementation on progression of age related macular degenerationwere investigated in five studies. Dietary intake of antioxidant supplementation was associated with slow progression of age related macular degeneration, improve vision, and reduce risk of developing age related macular degeneration in elderly people.
**Conclusion:** Antioxidants supplementationcould slow the progression of age related macular degeneration. Furthermore, supplementation of antioxidants might improve the visual function in patients with age related macular degeneration.



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## INTRODUCTION

Age-related macular degeneration (AMD) is a degenerative disorder which affect the macula, the central part of the retina (Moeller *et al*., 2006). AMD is the leading cause of visual disability in patients 60 years or older in the Western population (Klein *et al*., 1997). The prevalence of late AMD steeply increases with age, affecting 11.5% of white people older than 80 years (Friedman *et al*., 2004). In the absence of effective treatment for AMD, the number of patients severely disabled by late-stage AMD is expected to increase in the next 20 years by more than 50% to 3 million in the United States alone (Friedman *et al*., 2004). As in other age-related disorders, oxidative stress has been implicated in the etiology of AMD (Zarbin, 2004). The aim of this review is to assess the impact of antioxidant supplementation on the progression of AMD.

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## MATERIALS AND METHODS

A literature search using Medline database for the years 1946 to 2017 was undertaken to explore the effects of antioxidants supplementation on the progression of age related macular degeneration. The following keywords were used: Antioxidant supplementation, age related macular degeneration, relationship, progression of visual loss, progression of age related macular degeneration. The search was restricted to articles published in English language. The first 30 articles were reviewed and five relevant studies were selected in this article.

## RESULTS

Five studies examined the relationship between antioxidant supplementation and progression of age related macular degeneration (AMD) (Age-Related Eye Disease Study Research Group, 2001; Stuart Richer *et al*., 2004; Seddon *et al*., 1994; Tan *et al*., 2008; van Leeuwen *et al*., 2005).

A randomized, placebo-controlled clinical trial assessed the effect of high-dose vitamins C and E, beta carotene, and zinc supplements on AMD progression and visual acuity (Age-Related Eye Disease Study Research Group, 2001). This study recommend the use of a supplement of antioxidants plus zinc when there is no contraindication of using such a supplement (Age-Related Eye Disease Study Research Group, 2001). Another Double-masked, placebo-controlled, randomized studywas designed to determine whether nutritional supplementation with lutein or lutein together with antioxidants, vitamins, and minerals, improves visual function and symptoms in atrophic AMD (Stuart Richer *et al*., 2004). The result showed that visual function was improved with lutein alone or lutein together with other nutrients (Stuart Richer *et al*., 2004). One study was conducted in five ophthalmology centers in the United States to evaluate the relationships between dietary intake of carotenoids and vitamins A, C, and E and the risk of neovascularAMD (Seddon *et al*., 1994). Result revealed that consumption of foods rich in certain carotenoids, in particular dark green, leafy vegetables, might decrease the risk of developing advanced or exudative AMD (Seddon *et al*., 1994). The relationship between baseline dietary and supplement intakes of antioxidants and the long-term risk of incident AMD was evaluated in population-based cohort study (Tan *et al*., 2008). Higher dietary lutein and zeaxanthin intake reduced the risk of long-term incident AMD but higher β-carotene intake was associated with an increased risk of AMD (Tan *et al*., 2008). Dietary intake of antioxidants and risk of age-related macular degeneration was investigated (van Leeuwen *et al*., 2005). High dietary intake of beta carotene, vitamins C and E, and zinc was associated with a substantially reduced risk of AMD in elderly persons (van Leeuwen *et al*., 2005).

## DISCUSSION

There is a good number of evidences revealed the positive effects of antioxidants supplementation on the progression or development of age related macular degeneration (Age-Related Eye Disease Study Research Group, 2001; Stuart Richer *et al*., 2004; Seddon *et al*., 1994; Tan *et al*., 2008; van Leeuwen *et al*., 2005). Those effects include but not limited to slow progression of age related macular degeneration, improvement of visual function, and preventing old population from development of age related macular degeneration. This review suggests that offering of antioxidants supplementation to old societies can decrease the risk of developing age related macular degeneration or slow the progression of this disease.

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