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Macular Ganglion Cell Complex and Retinal Nerve Fiber Layer Comparison in Different Stages of Age-Related Macular Degeneration

Ilaria Zucchiatti, Maurizio Battaglia Parodi, Luisa Pierro, Maria Vittoria Cicinelli, Marco Gagliardi, Niccolò Castellino, Francesco Bandello

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Abstract

Purpose: To employ Optical Coherence Tomography (OCT) to analyze the morphological changes in the inner retina in different categories of Age-related Macular Degeneration (AMD).

Design: Observational, cross-sectional study

Methods: Single-center study**.** Inclusion criteria were age over 50, diagnosis of Age-Related Eye Disease Study (AREDS) category 2 and 3, naïve neovascular AMD and atrophic AMD. Healthy patients of similar age acted as a control group. Primary outcome measures were the changes in ganglion cell complex (GCC) and retinal nerve fiber layer (RNFL). Secondary outcomes included modifications of rim area and cup-to-disk ratio.

Results: One hundred and thirty eyes of 130 patients were recruited: 26 eyes for AREDS category 2, 26 for AREDS category 3, 26 for neovascular AMD, 26 with atrophic AMD and 26 controls. Mean peripapillary RNFL thickness was significantly lower in neovascular AMD, compared to controls ($p=0.004$); peripapillary RNFL did not significantly vary among AREDS category 2 and 3 and atrophic AMD groups, compared to controls. Mean GCC thickness was higher in control group, becoming progressively thinner up to neovascular and atrophic AMD groups ($p<0.0001$). Rim area was significantly thinner in neovascular AMD group compared with controls ($p=0.047$); cup-to-disk ratio was higher in neovascular AMD group compared with control group ($p=0.047$).

Conclusions: This study demonstrates that eyes with neovascular AMD display reduced RNFL and GCC thickness. RNFL is partially spared in atrophic advanced AMD. The identification of alteration in RNFL and GCC thickness may reveal useful for future therapeutic implications.