Inner retinal layer change in glaucoma patients receiving anti-VEGF for neovascular age related macular degeneration

ABSTRACT

Purpose: The purpose was to evaluate the effects of long-term anti-VEGF treatment on the retinal nerve fiber layer (RNFL) and retinal ganglion cell layer (RGCL) thickness for patients with neovascular AMD and glaucoma. Methods: Medical records of respective patients who had received more than 15 anti-VEGF injections were reviewed. Initial and latest SD-OCT macular scans were segmented and changes of the RNFL and RGCL thickness at the four outer ETDRS quadrants were evaluated. Secondary outcome measures included changes of visual field parameters seen in automated perimetry. Results: Sixteen patients were included (mean age 78 ± 6 years). The mean total number of anti-VEGF injections was 39 ± 16. The mean treatment duration was 6.1 ± 2.1 years. The mean IOP decreased from 18 ± 5 mmHg at baseline to 15 ± 5 mmHg at the last visit ($p = 0.026$). The mean RNFL thickness volume of the outer ETDRS quadrants (0.98 ± 0.18 mm^3 to 0.97 ± 0.18 mm^3 $p = 0.61$) and its average thickness (37.9 ± 7.3 μm to 37.2 ± 7.4 μm, $p = 0.6$) did not significantly change. However, the average RGCL thickness decreased significantly from 0.86 ± 0.12 mm^3 to 0.79 ± 0.11 mm^3 ($p = 0.01$), and from 27.7 ± 4.2 to 25.9 ± 3.7 μm ($p = 0.01$). Number of injections correlated with the RGCL change ($r2 = 0.36$, $p = 0.01$). The mean sensitivity, mean defect and absolute scotomata did not significantly change with p-values of 0.28, 0.21 and 0.07, respectively. Conclusion: Patients under long term treatment with anti-VEGF and concurrent glaucoma show significant decrease in macular RGLC volume. However, this decrease is comparable to reported RGCL decrease in patients under anti-VEGF treatment without underlying glaucoma and suggests that glaucoma patients may not be at a higher risk for losing macular RNFL and RGCL, at least if adequate control of intraocular pressure is maintained.

Keyword: Retinal nerve fiber layer thickness; Ganglion cell layer thickness; Anti-VEGF; Wet AMD; Glaucoma; Exudative age-related macular degeneration; Intraocular pressure; Ocular hypertension; Visual fields; Retinal layer segmentation