Recent reports suggest retinal and macular thickness is a biomarker of neurodegenerative disease progression within the eyes of patients with multiple sclerosis (MS) without optic neuritis (ON).

Optical Coherence Tomography (OCT) can be a useful clinical measure obtained as part of regular clinical care for monitoring disease and disease activity.

Traditional OCT scanners require considerable technical skill to perform, and are not very portable.

We tested a compact, semi-automated OCT scanner for measuring retinal nerve fiber layer (RNFL) thickness, retinal (macular) thickness and volume, and ganglion cell complex (GCC) thickness in multiple sclerosis patients with and without self-reported ON.

Assess the relationship of the Pelli-Robson contrast scores and thickness measures obtained from OCT.

Cross-sectional study of 89 MS patients (178 eyes) with and without prior self-reported history of optic neuritis.

RNFL thickness, macular thicknesses and volumes, and GCC thicknesses collected using the Spectral-Domain OCT scanner (iS葆can 500 OCT) scanner.

15 patients (30 eyes) excluded due to prior ophthalmologic conditions.

7 eyes excluded due to insufficient scan quality.

4 eyes excluded due to missing scans.

RNFL and Macular Volumes were available from 71 MS patients (137 eyes).

4 patients (8 eyes) excluded due to prior ophthalmologic conditions; 19 patients (38 eyes) analyzed.

Contrast sensitivity measured for each eye with a Pelli-Robson (PR) contrast chart.

Mean group differences in Pelli-Robson scores, average RNFL Thickness, average inner GCC Thickness, and Macular Volume were assessed by ANOVA.

Correlations between OCT measurements and Pelli-Robson scores were analyzed using Spearman correlations.

Macula of Retina

Table 7: Means and Standard Deviations of Full Retinal Nerve Fiber Layer Volume and Macular Thickness

<table>
<thead>
<tr>
<th></th>
<th>No ON</th>
<th>ON</th>
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<tr>
<td>N</td>
<td>61</td>
<td>10</td>
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</table>
| Retinal Nerve Fiber Layer (RNFL) Volume (mm³) | 18.9 ± 6.0 | 32.9 ± 10.7 | 0.002
| Macular Thickness (μm) | 285 ± 22 | 285 ± 29 | 0.83 |
| Macular Volume (mm³) | 295 ± 10 | 145 ± 13 | 0.008

Discussion

Optovue iScan 500 is a reliable evaluation tool in measuring retinal parameters within an MS center.

Capable of studying patients based on prior optic neuritis history.

GCC thickness is available at the time of acquisition, and requires no further analysis or post-processing.

Pelli-Robson is feasible to acquire as a single contrast assessment in MS patients’ eyes with and without optic neuritis.

Pelli-Robson score, RNFL Thickness, GCC Thickness, and Macular Thickness (Parafovea and Perifovea) were all significantly reduced in Affected (ON+) eyes in patients with prior ON.

Unaffected (ON-) eyes were relatively spared in thinning during an ON episode except in RNFL and GCC.

Optovue is a semi-automated device which can provide detailed information about RNFL, GCC, and macular volume in approximately 10 minutes.