

Authors	Study type	Number of patients			OCT type	Objective and key findings	Limitations
		NMO(-SD)	MS	HC			
Merle (2008) <sup>47</sup>	CS	15	15	23	TD, St	<ul style="list-style-type: none"> <li>- <b>RNFL in NMO and differences to MS</b></li> <li>- Average pRNFL reduced in NMO compared to HC (<math>p &lt; 0.0001</math>) and MS (<math>p = 0.01</math>)</li> <li>- Visual acuity in NMO is stronger impaired than in MS</li> <li>- pRNFL correlates with VA, CS, VF, visual EDSS, No of ON episodes</li> </ul>	<ul style="list-style-type: none"> <li>- NON eyes no statistical analysis</li> <li>- No macula analysis</li> </ul>
De Seze (2008) <sup>46</sup>	CS, P	35 (29 NMO and 6 NMOSD)	-	15	TD, St	<ul style="list-style-type: none"> <li>- <b>pRNFL comparison of NMO and HC and visual impairment</b></li> <li>- Average pRNFL reduced in NMO (<math>p &lt; 0.001</math>)</li> <li>- OCT correlates with VF, VA/VEP, and EDSS</li> </ul>	<ul style="list-style-type: none"> <li>- Mix of ON and NON eyes</li> <li>- No MS</li> <li>- No macula analysis</li> </ul>
Naismith (2009) <sup>43</sup>	CS	22 (17 NMO, 5 NMOSD)	47	-	TD, St	<ul style="list-style-type: none"> <li>- <b>pRNFL comparison of NMO and MS and visual impairment</b></li> <li>- Average pRNFL reduced in NMO compared to MS (<math>p &lt; 0.01</math>)</li> <li>- Average pRNFL reduced in NMO-ON compared to MS-ON (<math>p &lt; 0.05</math>)</li> <li>- I, S, N quadrant in NMO more affected than in MS, T quadrant NMO similar to MS</li> <li>- RNFL in MS-NON thinner than in NMO-NON (<math>p &lt; 0.05</math>)</li> </ul>	<ul style="list-style-type: none"> <li>- No macula analysis</li> </ul>
Ratchford (2009) <sup>42</sup>	MC, CS	26 (19 NMO, 7 NMOSD with ON), 17 LETM	378	77	TD, St	<ul style="list-style-type: none"> <li>- <b>pRNFL and TMV and visual parameters for differentiation between NMO and MS</b></li> <li>- Average pRNFL, TMV and LCVA reduced in NMO-ON compared to HC (all <math>p &lt; 0.0001</math>)</li> <li>- Average pRNFL and TMV reduced in NMO-ON compared to MS-ON (pRNFL: <math>p &lt; 0.0001</math>; TMV: <math>p = 0.001</math>)</li> <li>- No significant difference for pRNFL, TMV and LCVA between NMO-NON and HC</li> <li>- Correlations with VA and CS: NMO also functional stronger affected</li> </ul>	<ul style="list-style-type: none"> <li>- No RNFL quadrant analysis</li> </ul>
Green (2009) <sup>44</sup>	CS	16	16	-	TD, St	<ul style="list-style-type: none"> <li>- <b>Distinctive retinal nerve fibre layer and vascular changes in neuromyelitis optica following optic neuritis</b></li> <li>- More vascular changes in NMO compared to MS</li> <li>- Average pRNFL reduced in NMO compared to MS</li> <li>- In NMO all quadrants affected, in MS mainly temporal</li> </ul>	<ul style="list-style-type: none"> <li>- In results no numbers for OCT parameters</li> <li>- No macula analysis</li> </ul>
Nakamura (2010) <sup>45</sup>	CS, IV	18 (14 NMO, 4 NMOSD - ON)	14	-	TD, St	<ul style="list-style-type: none"> <li>- <b>Comparison of RNFL between NMO and MS and effect of high-dose intravenous methylprednisolone (HIMP)</b></li> <li>- Average pRNFL reduced in NMO-ON compared to MS-ON (<math>p = 0.0006</math>)</li> <li>- All pRNFL quadrants reduced in NMO-ON compared to MS-ON (S, I: <math>p &lt; 0.001</math>, N, T: n.s.)</li> <li>- RNFL correlates with VA in both MS and NMO</li> <li>- HIMP helped to preserve the RNFL</li> </ul>	<ul style="list-style-type: none"> <li>- NON eyes not statistically analyzed</li> <li>- No macula analysis</li> </ul>
Monteiro (2012) <sup>54</sup>	CS, P	33 NMOSD 28 LETM-NON	60	41	SD, To	<ul style="list-style-type: none"> <li>- <b>RNFL and macular thickness comparison of NMO and MS</b></li> <li>- Average pRNFL reduced in NMO-ON compared to MS-ON (<math>p = 0.02</math>) and HC (<math>p &lt; 0.0001</math>)</li> </ul>	<ul style="list-style-type: none"> <li>- 15 NMO eyes excluded due to poor vision</li> </ul>

						<ul style="list-style-type: none"> <li>- Average pRNFL reduced in LETM compared to HC (<math>p &lt; 0.001</math>)</li> <li>- No difference in macular thickness in NMO-ON compared to MS-ON</li> <li>- OCT correlates with VF</li> </ul>	- Only NMO eyes with ON were studied
Syc (2012) <sup>55</sup>	L, MC	22	98	72	SD, Ci	<p><b>- Six months follow up study of inner-retinal layer analysis after ON in MS and NMO</b></p> <p>Cross-sectional:</p> <ul style="list-style-type: none"> <li>- Average pRNFL reduced in NMO-ON compared to MS-ON (<math>p &lt; 0.001</math>)</li> <li>- No difference in average pRNFL in NMO-NON compared to MS-NON</li> <li>- GCIP in MS-ON, MS-NON, NMO-ON and NMO-NON(!) reduced compared to HC</li> </ul> <p>Longitudinal:</p> <ul style="list-style-type: none"> <li>- Thinning of the GCIP in eyes affected by acute ON 3 and 6 months after onset (<math>p &lt; 0.001</math>)</li> <li>- In contrast to RNFL, no swelling of GCL in acute ON</li> </ul>	- Compared only ON vs. NON eye
Bouyon (2013) <sup>52</sup>	L	30	-	-	TD, St	<p><b>- OCT and visual follow-up in NMO (2 visits)</b></p> <ul style="list-style-type: none"> <li>- RNFL decrease (<math>p = 0.006</math>)</li> <li>- TMV decrease n.s.</li> <li>- VA change n.s.</li> </ul>	<ul style="list-style-type: none"> <li>- No HC</li> <li>- No MS</li> </ul>
Fernandes (2013) <sup>51</sup>	CS, O, P	29 NMO, 29 LETM	73	45	SD, To	<p><b>- Evaluation of Inner Retinal Layers in Patients with Multiple Sclerosis or Neuromyelitis Optica</b></p> <ul style="list-style-type: none"> <li>- mRNFL reduced in all (even LETM!) patient groups compared to HC</li> <li>- GCIP reduced in NMO, MS-ON, MS-NON compared to HC</li> <li>- INL in NMO thicker than in MS-ON</li> <li>- No difference in mRNFL and GCIP between NMO and MS-ON patients</li> </ul>	<ul style="list-style-type: none"> <li>- NMO group both ON and NON-eyes? (not clear)</li> <li>- No pRNFL analysis</li> <li>- No TMV analysis</li> </ul>
Gelfand (2013) <sup>49</sup>	O, R	23 NMO, 2 NMOSD with ON	-	-	SD, Sp	<p><b>- MME in NMO (retinal layer analysis)</b></p> <ul style="list-style-type: none"> <li>- MME in 20% of NMO patients</li> <li>- MME only in eyes with previous ON</li> <li>- pRNFL thinner in MME eyes compared with all NMO eyes without MME (<math>p = 0.02</math>);</li> <li>- TMV comparisons n.s.</li> <li>- VA reduced in MME eyes compared to non-MME (<math>p = 0.02</math>)</li> </ul>	- No MS
Sotirchos (2013) <sup>56</sup>	CS	39 (31 NMO&NMOSD with ON, 8 AQP4+ LETM)	-	39	SD, Ci	<p><b>- Intra-retinal layer analysis in NMO patients with focus on MME</b></p> <ul style="list-style-type: none"> <li>- MME in 26% of NMO patients</li> <li>- MME only in ON eyes</li> <li>- MME eyes in relation to non-MME ON eyes: <ul style="list-style-type: none"> <li>• Lower pRNFL (<math>p = 0.04</math>), mRNFL thickness (<math>p = 0.004</math>), GCIP (<math>p = 0.007</math>)</li> <li>• Higher INL thickness (<math>p = 0.001</math>)</li> <li>• Lower high- and low-contrast VA</li> </ul> </li> </ul>	- No TMV analysis
Schneider (2013)	CS	17 (13 NMO, 4 NMOSD)	17	17	SD, Sp	<b>- One-to-one matching inner retinal layer comparison of NMO, MS and HC eyes with focus on ON</b>	

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Lange (2013) <sup>48</sup>	CS	25 (15 NMO, 10 NMOSD)	25	50	SD, Sp	<ul style="list-style-type: none"> <li>- <b>RNFL marker for NMO?</b></li> <li>- Average pRNFL reduced in NMO-ON compared to HC (<math>p &lt; 0.0001</math>)</li> <li>- No difference in RNFL between NMO-NON and HC (<math>p = 0.56</math>)</li> <li>- No significant differences between pRNFL of NMO and MS eyes with 1 attack of ON</li> </ul>	- No macular analysis
Park (2013) <sup>57</sup>	CP, O, CSS	19 (not Wingerchuk)	15	25	SD, Sp	<ul style="list-style-type: none"> <li>- <b>Retinal layer analysis in different macular locations in ON eyes from different diseases</b></li> <li>- Also included 22 patients with isolated ON</li> <li>- Included only ON eyes and only one eye per patient</li> <li>- pRNFL different between isolated ON, NMO and MS in T (<math>p = 0.029</math>) and I (<math>p = 0.013</math>), average, S, N n.s.</li> </ul>	<ul style="list-style-type: none"> <li>- Unclear statistical model</li> <li>- Bonferoni Holm correction -&gt; very strict</li> <li>- No TMV analysis</li> </ul>
Bichueti (2013) <sup>81</sup>	CS	9	48		SD, Sp	<ul style="list-style-type: none"> <li>- <b>Comparison of RNFL in RRMS, NMO and CRION</b></li> <li>- pRNFL and VA significantly worse in NMO (<math>p = 0.004</math>) and CRION (<math>p &lt; 0.0001</math>) compared to RRMS after ON</li> <li>- No differences between NMO and CRION eyes</li> </ul>	- No TMV analysis
Kaufhold (2013) <sup>58</sup>	RS, CS	20 NMOSD (incl. AQP4+ LETM)	219 MS, 39 CIS	121	SD, Sp	<ul style="list-style-type: none"> <li>- <b>ON is associated with INL thickening and MME independently of MS</b></li> <li>- MME only in ON eyes (with 1 exception)</li> <li>- MME frequency in ON eyes: <ul style="list-style-type: none"> <li>• 6.3% in MS</li> <li>• 21.0% in NMOSD</li> </ul> </li> <li>Subgroup unilateral ON: ON compared to NON eyes reduced mRNFL thickness (<math>p &lt; 0.001</math>) and GCIP (<math>p &lt; 0.001</math>) but higher INL thickness (<math>p &lt; 0.001</math>)</li> </ul>	- No layer thicknesses for different disease cohorts
Glehn (2014) <sup>73</sup>	CS	21 NMOSD (incl. AQP4+ LETM)		34	SD, Sp	<ul style="list-style-type: none"> <li>- <b>Correlation of RNFL to MRI derived brain measures</b></li> <li>- pRNFL is significantly reduced in NMOSD compared to HC in average and all quadrants (all <math>p &lt; 0.001</math>)</li> <li>- Correlation between RNFL and pericalcarine cortical thickness</li> <li>- NMOSD is associated with grey and white matter atrophy</li> </ul>	<ul style="list-style-type: none"> <li>- No macular analysis</li> <li>- No MS</li> <li>- No independent analysis for ON</li> </ul>

Legend: CS: cross-sectional; P: prospective; MC: multi-center; O: observational; L: longitudinal; IV: interventional; RS: retrospective; CSS: case series study; TD: Time Domain; SD: Spectral Domain OCT; St: Stratus TD-OCT, Carl Zeiss Meditec; Ci: Cirrus HD-OCT, Carl Zeiss Meditec; Sp: Spectralis OCT, Heidelberg Engineering; NMOSD: neuromyelitis optica spectrum disorder; MS: multiple sclerosis; LETM: longitudinally extensive transverse myelitis; ON: optic neuritis;

NON: eyes without history of optic neuritis; HC: healthy controls; OCT: optical coherence tomography; CRION: chronic inflammatory optic neuropathy; CIS: clinically isolated syndrome; p/mRNFL: peripapillary/macular retinal nerve fiber layer; TMV: total macular volume; GCL: ganglion cell layer; IPL: inner plexiform layer; GCIP: Ganglion cell and inner plexiform layer; INL: inner nuclear layer; VA: visual acuity; VF: visual field; CS: contrast sensitivity; LCVS: Low-contrast visual sensitivity; MME: Microcystic macular edema; n.s.: not significant; RNFL quadrants: I: inferior; S: superior; N: nasal; T: temporal;

Comments:

- **Bold title:** Either manuscript title or rough description of content
- p-values mainly only for pRNFL values because these were used in most studies