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**LARGE OPTIC DISCS MAY MAINTAIN MUTATION CARRIERS AS UNAFFECTED IN AN EXTENDED BRAZILIAN PEDIGREE WITH LEBER'S HEREDITARY OPTIC NEUROPATHY**

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**Purpose:** To investigate retinal nerve fiber layer thickness (RNFL) and optic nerve head (ONH) morphology in a large family from Brazil with Leber's hereditary optic neuropathy (LHON) carrying the 11778/ND4 mutation.
**Methods:** We enrolled 139 individuals belonging to the previously reported Brazilian SOA-BR LHON pedigree, divided in the following subgroups: 13 LHON affected patients (LHON-affected), 48 LHON unaffected mutation carriers (LHON-carrier) and 78 controls (26 off maternal lineage spouses and 52 descendants of males who do not carry or inherit respectively the LHON mutation). All individuals underwent optical coherence tomography (OCT) measurements including RNFL thickness and ONH analysis.
**Results:** The RNFL thickness analysis showed a significant increase in the temporal and inferior quadrants as well as in the 360° average in the LHON-carrier compared to controls. This RNFL thickening was particularly significant in male LHON-carrier. LHON-affected had a drastic reduction of RNFL thickness in all measurements. ONH topographic analysis showed a significantly larger optic disc area and vertical disc diameter in LHON-carrier compared to LHON-affected and controls, whereas LHON-affected did not show a statistical difference with controls.

**Conclusions:** Our study confirms the previously reported pattern of RNFL changes in LHON. Further, we show that anatomical conformation of ONH may be an important determinant of disease penetrance, large optic discs being a putative protective factor. If these data, obtained in a single large family, are a general feature in LHON, the ONH investigation by OCT may have a prognostic significance for risk of being affected.