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TDP-43 aggregation in the retina of patients with FTLD-TDP

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State-of-the-art
Currently, no ante-mortem biomarkers are available to distinguish between the different pathological subtypes FTLD-TDP, FTLD-tau and FTLD-FUS. As an extension of the brain, the retina displays similarities in terms of anatomy and functionality. The accessibility of the retina provides a 'window' into the brain and a great potential for noninvasive imaging of neurodegenerative changes in patients. The aim of this study is to assess the presence of TDP-43 aggregates in the retina.
Methods
Post-mortem retina tissue was obtained from donors with FTLD-TDP (n=7), of which 4 donors carried a *C9orf72* repeat expansion, one progranulin *(PRGN)* mutation and two sporadic donors. We also included donors with FTLD–tau (n=5), FTLD-FUS (n=1) , AD with limbic TDP43 depositions (n=2), and donors with ALS-TDP (n=2). Immunohistochemical stainings were performed for panTDP43, phosphorylated TDP43 (pTDP43), p62, and dipeptides (polyGA and polyGP).
Results
In all FTLD-TDP donors, TDP-43 inclusions were observed in the outer plexiform layer of the retina. No TDP-43 inclusions were observed in other donors. All *C9orf72* donors showed dipeptide inclusions in the inner nuclear layer of the retina, and the burden of depositions in the retina reflected the burden in the brain.
Conclusion
Manifestations of TDP-43 and dipeptide pathology are present in the retina of patients with FTLD-TDP and not in other donors, suggesting that retinal TDP-43 pathology is specific for FTLD-TDP.
With the advances in ocular imaging techniques these findings provide opportunities for non-invasive retinal imaging for diagnosis and monitoring progression of CNS disorders.

Conflicts of interest

N/A