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Serum light-chain neurofilament is associated with brain atrophy in patients with atrial fibrillation

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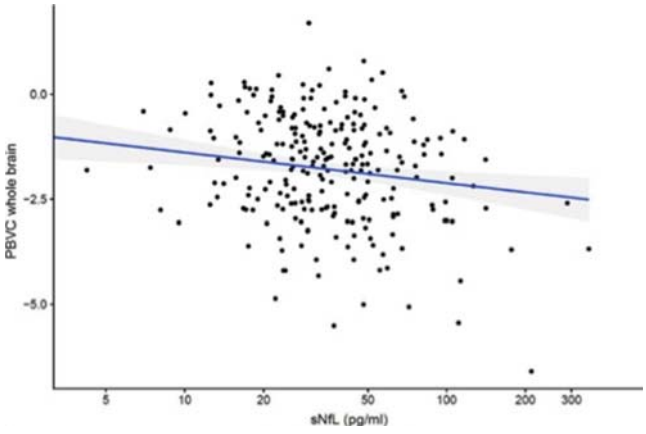
Background and aims: There is emerging evidence that atrial fibrillation (AF) is associated with cognitive dysfunction, increased risk for dementia and reduced brain volume independent of stroke, but the underlying mechanisms of these associations remain unclear. Here, we investigated the association of serum light-chain neurofilament (sNfL), a neuroaxonal injury biomarker, with brain atrophy in AF patients.

Methods: Explorative analysis from the Swiss-AF cohort study, a multicenter prospective observationalstudy which recruited patients aged ≥45 years with documented AF (NCT02105844). In baseline blood samples, sNfL concentrations were measured in duplicates using a single-molecule array assay. Brain MRI was obtained at baseline and at two years using a standardized protocol including a 3D T1-weighted MPRAGE sequence, on which Structural Image Evaluation using Normalization of Atrophy (SIENA) with optimized parameters for brain extraction was applied to calculate the two-year percentage whole brain volume change (PBVC).

Results: We included 245 Swiss-AF patients (median age 73, 73% male). Two-year PBVC was significantly associated with baseline sNfL in linear regression, with a 0.09% whole brain volume decrease per 10 pg/ml sNfL increase (95% CI [0.05–0.13], p<0.001). This association remained significant after adjustment for age, history of stroke and other vascular risk factors.

Conclusion: Increasing baseline sNfL was predictive of higher two-year brain atrophy rates independent of stroke history in AF patients. This association might reflect a chronic neurodegenerative process in AF.



Neurofilament and brain atrophy