DEMTEST

Biomarker-based diagnosis of rapid progressive dementias: Optimisation of diagnostic protocols

Project lifespan: 2012-2015

WHY?

A major challenge in the diagnosis of rapid progressive dementias (RPD) is that methodologies in different centres have been very heterogeneous, resulting in misdiagnosed cases.

OBJECTIVE

DEMTEST aimed to harmonise biomarker protocols and standardise and improve RPD diagnoses through the analysis of markers in cerebrospinal fluid and blood and the application of new methodologies.

ACHIEVEMENTS

- A prospective biobank with different biological fluids (CSF, blood, urine) and tissue material (brain, liver) from patients with a RPD diagnosis was established, and follow-up studies were conducted to verify clinical diagnosis and obtain postmortem identification. This led to substantial progress in the standardization of pre-analytic conditions influencing sample stability and marker degradation during storage.
- New protocols and recommendations for biomaterial collection and storage were established and exchanged among international partners, improving the accuracy of biomarker detection.
- DEMTEST established new technology (PrPSc-HPFRET, digital prion infectivity assay), software ("dPIA Global Fitter") and devices (a robotic platform containing Perkin-Elmer Janus automated work station, Biotek washer and dispenser, LiCONiC automated incubator and Envision plate reader.)
- Establishment of RT-QuIC (Real-Time-Quaking induced Conversion) as a very robust and highly reproducible assay in prion disease diagnosis, with a specificity of almost 100%.

DEMTEST: BY THE NUMBERS

- Brought together 18 partners from 13 countries
- Published 37 papers in peer-reviewed journals
- Resulted in two new assays for 14-3-3 and alpha-synuclein detection in CSF, with remarkably high sensitivity and specificity (>90%)
- Submitted one patent for a blood test to detect endogenous vCJD prions in blood

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