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Transthyretin cardiac (TTR) amyloidosis, polyneuropathy and dementia

Aims

To present transthyretin (TTR) cardiac and systemic amyloidosis as a cause of dementia at the crossroad of heart and brain associated pathology.

Methods/Design

Invited talk. The purpose is to discuss TTR cardiac and systemic amyloidosis as etiology of vascular or mixed dementia from a single case to registries. The talk will also detail mechanisms of vascular dementia including TTR brain amyloidosis, the current shifting paradigm from one single etiology to mixed dementia as a result of brain co-pathology in 70-80% of dementia cases, and the current knowledge of preclinical Alzheimer's disease cascade, accelerated in the presence of vascular risk factors.

Results

TTR cardiac and systemic amyloidosis with polyneuropathy is the result of altered TTR, a tetramer protein that misfolds and deposits as fibrils in the heart and other organs with TTR gene localized on ch18q12.1 and >80 confirmed pathogenic mutations. Clinical phenotype of TTR amyloidosis varies by mutation. TTR cerebral amyloid angiopathy (CAA) has been frequently reported in association with hereditary TTR cardiac amyloidosis, exceptionally with the wild-type TTR. TTR cardiomyopathy is non-invasively identified through echocardiography and amyloid cardiac scan and confirmed by tissue biopsy from other sites (abdominal fat, etc.) or direct endomyocardial. TTR-CAA could be diagnosed by extrapolating Boston criteria 2.0 for Abeta-amyloid CAA +/- brain biopsy.

Conclusion

Though the number of people living with dementia is rising worldwide, to-date, dementia is 40% a potentially preventable disease, mostly through early initiation of AHA life's essential 8, plus few other modifiable risk factors. Nevertheless, TTR cardiac and systemic amyloidosis represents a unique genetic disorder and a rare singular etiology of vascular dementia in which dementia prevention resides primarily in early diagnosis of cardiac amyloidosis for patients to benefit from also specific existing treatments (TTR stabilizers and inhibitory oligonucleotide) and possible future drug trials, in addition to lifestyle modifications.



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Biography

Dr. Rodica Elena Petrea - born and raised in Romania - is an international neurologist with expertise in stroke and vascular dementia. At present, she lives and works in the USA. Dr. Rodica Elena Petrea achieved her medical doctor (MD) diploma from “Carol Davila” University of Medicine and Pharmacy in Bucharest, Romania (1995). She completed her neurology training both in Bucharest, Romania in 2000 and in U.S., in Boston, MA in 2007 before she was certified in neurology by both the Romanian Board of Neurology in 2000 and the American Board of Neurology and Psychiatry in 2008 and 2012. In 2012, she became a Diplomate of the American Board of Neurology and Psychiatry. She also completed a one-year PhD (Cardiac enzymes and EKG changes in acute ischemic and hemorrhagic strokes) at the Neurological Institute in Bucharest, Romania (2001); was awarded a three-month Pont Neuf neurology scholarship in Paris, France (2000-2001); and followed her main neurological curiosities with fellowships in vascular neurology/stroke, neurocognitive disorders, and a T32 post-doctoral research fellowship in cardiovascular epidemiology at Boston University, at the Framingham Heart Study, and at the Veteran Affairs Hospitals in Boston, MA, U.S. (2004-2008; 2020-2024). Dr. Rodica Elena Petrea held university appointments as Faculty at the University of Kentucky, Lexington, Kentucky, U.S. (2010-2012); at Creighton University, Omaha, Nebraska, U.S. (2012-2018); and her most recent appointment at California Touro University and Saint Joseph’s Medical Center in Stockton, California, U.S. (since 2024). She has published over 50 peer-reviewed abstracts, posters, papers and two book chapters. She has done over 100 scientific lectures and presentations, and led discussions at regional, national and international conferences, mostly on acute stroke and stroke prevention. Her main research interests are original interesting clinical cases and epidemiological studies on heart-brain syndromes, brain aging, aortic disease and vascular risk factors, sex-differences among stroke patients, and vascular dementia. She has also focused on some rare syndromes and disorders such as Takotsubo cardiomyopathy and associated neurological conditions beyond stroke, TTR amyloidosis, dysphagia and opercular syndrome, genetic disorders such as CADASIL and other mono/polygenic associated disorders. She speaks Romanian, English and French. In her spare time, she enjoys music, art and travel.