Alzheimer's CSF markers in older schizophrenia patients

Giovanni B. Frisoni, MD [1] [2], Annapaola Prestia, PsyD [1], Cristina Geroldi, MD[1] [2], Andrea Adorni, MD [1] [2], Roberta Ghidoni, MD [3] [4], Giovanni Amicucci, MD [5], Matteo Bonetti, MD [6], Andrea Soricelli, MD[7], Paul E. Rasser, MSc [8] [9], Paul M. Thompson, PhD [10], and Panteleimon Giannakopoulos, MD [11] [12]

[1] LENITEM – Laboratory of Epidemiology Neuroimaging and Telemedicine, [2] Psychogeriatric Ward,[3] Proteomics Unit, and [4] NeuroBioGen Lab-Memory Clinic, IRCCS Centro San Giovanni di Dio FBF, Brescia, Italy

[5] Service of Anesthesiology, S.Orsola-Fatebenefratelli Hospital, Brescia, Italy

[6] Service of Neuroradiology, Istituto Clinico Città di Brescia, Brescia, Italy

[7] SDN Foundation and Institute of Diagnostic and Nuclear Development, and University of Naples Parthenope, Naples, Italy

[8] Schizophrenia Research Institute, Sydney, and [9] Priority Centre for Brain and Mental Health Research, School of Design, Communication and IT, University of Newcastle, Newcastle, Australia

[10] Laboratory of Neuro Imaging, UCLA School of Medicine, Los Angeles, USA

[11] Division of Geriatric Psychiatry, University Hospitals of Geneva and Faculty of Medicine, University of Geneva, and [12] Division of Old Age Psychiatry, Hospices-CHUV, University of Lausanne, Switzerland

Corresponding Author: Giovanni B. Frisoni, IRCCS Fatebenefratelli, via Pilastroni 1, 25125 Brescia, Italy - Telephone +39 030 3501361, email gfrisoni@fatebenefratelli.it

Acknowledgments and financial disclosure: This work was supported by the grants Programma Strategico 2007, conv. PS39, and Ricerca Corrente, Italian Ministry of Health. P.T. is supported, in part, by the NIBIB, NCRR, NIA, and NICHD, agencies of the U.S. National Institutes of Health.

All authors have no conflicts of interest to declare.

Abstract

Background: Cognitive impairment is prevalent in older schizophrenia patients but its biological basis is unknown. Neuropathological studies have not revealed Alzheimer disease (AD) lesion burden but *in vivo* data are lacking. We investigated the concentrations of CSF biomarkers of brain amyloidosis (Abeta42) and neurodegeneration (total and p-tau) in a group of older schizophrenia patients and related them to cognitive and structural magnetic resonance imaging (MRI) measures.

Methods: Older schizophrenia patients (n=11), AD patients (n=20) and healthy elderly controls (n=6) underwent cognitive testing, lumbar puncture, and MRI scanning. Abeta42 and total and p-tau concentrations were assayed in the CSF. MRI volumes were assessed using both voxel-based (cortical pattern matching) and region-of-interest analyses.

Result: CSF tau concentration in older schizophrenia patients was within normal limits (total tau 171±51 pg/ml, p-tau 32±8 pg/ml), while CSF Abeta42 (465±112 pg/ml) levels were significantly lower compared to healthy older persons (638±130 pg/ml) but higher than in AD patients (352±76 pg/ml). There was a strong positive relationship between CSF total or p-tau levels and MMSE scores in schizophrenia patients but not in AD, where higher concentrations of total tau were correlated with higher volumes in the occipital cortex ($r=.63$, $p=.036$). In AD, lower Abeta42 concentrations were correlated with lower gray matter volume in the cingulate and lateral orbital cortices ($r>.46$, $p<.05$).

Conclusion: Older schizophrenia patients show a peculiar pattern of CSF Abeta42 and tau concentrations that relates to cognitive and structural markers but is not consistent with neurodegeneration and could be secondary to neurodevelopmental or drug treatment effects.

Key words: CSF, Schizophrenia, Alzheimer disease, tau, Abeta, Brodmann areas;

Topic area: Diagnosis, biomarkers, neuroimaging, and clinical course of Alzheimer's disease and related neuropsychiatric disorders