Göteborg, 2021

Alzheimer's disease and vascular dementia in population-based studies

Akademisk avhandling

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademin, Göteborgs universitet kommer att offentligen försvaras i Arvid Carlssons hörsal, Medicinaregatan 3, Göteborg, den 23:e April, 2021 klockan 9:00.

av Mats Ribbe

Fakultetsopponent: Sölve Elmståhl, professor
Lunds universitet, Lund, Sverige

Avhandlingen baseras på följande delarbeten

I. Andersson M., Guo X., Börjesson-Hanson A., Liebetrau M., Östling S. and Skoog I. A Population-Based Study on Dementia and Stroke in 97 year olds. *Age Ageing.* 2012 Jul;41(4):529-33.

II. Ribbe M., Kern S., Börjesson-Hanson A., Östling S., Zetterberg H., Blennow K. and Skoog I. Amyloid ß42 and Total Tau Levels in Cerebrospinal Fluid Associate with Survival in an 85-year-old Population-Based Cohort Followed Until Death. *Dementia Geriatric Cognitiv Disorder* 2019;47(1-2):114-124.

III. Ribbe M., Kern S., Wetterberg H., Rydén L., Zettergren A., Guo X. and Skoog I. Time Trends in the Relation Between Blood Pressure and Dementia in 85-year-olds. *Submitted.*

IV. Ribbe M., Kern S., Machado A., Lindberg O., Westman E., Zetterberg H., Blennow K., Zettergren A. and Skoog I. The Effect of High Blood Pressure on Alzheimer's Specific Brain Regions. *Submitted*

På grund av rådande nationella restriktioner att minska smittspridningen av covid-19 är disputationen öppen för allmänheten via live-streaming. Länk finns på institutionens hemsida (https://neurophys.gu.se/aktuellt/kalendarium).

SAHLGRENSKA AKADEMIN
INSTITUTIONEN FÖR NEUROVETENSKAP OCH FYSIOLOGI

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Alzheimer's disease and vascular dementia in population-based studies

Mats Ribbe

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Dementia, a clinical syndrome with several profiles and causes, is characterised by a decline in cognitive functions, including memory, learning, executive function, attention, language, and social ability. The most common forms of dementia are Alzheimer's disease and vascular dementia. As life expectancy is increasing worldwide and age is one of the strongest risk factors for dementia, the prevalence of dementia will likely increase. This thesis explores pathophysiological hallmarks of Alzheimer's disease and vascular events as well as risk factors associated with dementia development in older individuals.

In study I, we explored the prevalence of dementia in the oldest old and the relationship between stroke, transient ischemic attack, and dementia. We found that dementia was very common in the oldest old, and prevalence of dementia was higher in women than in men. However, in this unique group of oldest old, the association between stroke and development of dementia diminished.

In study II, we explored biological markers of Alzheimer's disease in relation to mortality. Alzheimer's disease has measurable pathological biomarkers in the cerebrospinal fluid (Aβ42 and T-tau). The levels of these pathological biomarkers in 85-year-olds was associated with survival.

In study III, we compared two cohorts of 85-year-olds born 22 years apart. We found that 85-year-olds examined between 2008 and 2010 had lower blood pressure than 85-year-olds examined 22 years earlier. In both cohorts, participants with dementia had lower blood pressure than those without dementia.

In study IV, we investigated whether high blood pressure was associated with brain atrophy in Alzheimer's specific brain regions. We found that hypertension in 70-year-olds without dementia was related to atrophy in brain regions often affected in Alzheimer's disease, and atrophy was more widespread in those with longer duration of hypertension.

In summary, this thesis presents common risk factors for dementia and further investigates hallmarks in Alzheimer's disease with the aim to contribute to better understanding of Alzheimer's disease and vascular dementia.

Key words: Alzheimer's disease, cerebrospinal fluid, dementia, hypertension, magnetic resonance imaging, older, survival, vascular dementia.

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