

# FACTORS RELATED TO DEPRESSION IN WOMEN – OVER THE LIFE COURSE

Akademisk avhandling

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av

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Avhandlingen baseras på följande delarbeten:

- I. **Depression in Swedish Women: Relationship to Factors at Birth.** Pia Gudmundsson, Susan Andersson, Deborah Gustafson, Margda Waern, Svante Östling, Tore Hällström, Sigurdur Pálsson, Ingmar Skoog, Lena Hulthén.  
*European Journal of Epidemiology* 2011; 26: 55-60.
- II. **The relationship between cerebrospinal fluid biomarkers and depression in elderly women.** Pia Gudmundsson, Ingmar Skoog, Margda Waern, Kaj Blennow, Sigurdur Pálsson, Lars Rosengren, Deborah Gustafson.  
*American Journal of Geriatric Psychiatry* 2007; 15: 832-838.
- III. **Is there a CSF biomarker profile related to depression in elderly women?** Pia Gudmundsson, Ingmar Skoog, Margda Waern, Kaj Blennow, Henrik Zetterberg, Lars Rosengren, Deborah Gustafson.  
*Psychiatry Research* 2010; 176: 174-178.



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## **FACTORS RELATED TO DEPRESSION IN WOMEN – OVER THE LIFE COURSE**

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**Background:** Depression is a serious and common disorder that is predominant in women and has an unclear etiology. To evaluate factors related to depression is of great value and the main purpose of this thesis. A life course approach and a focus on biological factors are applied.

**Methods:** Biological factors were investigated in relationship to depression in the Prospective Population Study of Women in Gothenburg (PPSW), a multi-disciplinary longitudinal study on a representative sample of women first examined in 1968-69 (N=1462). Psychiatric examinations were performed in a subsample of women at baseline (N=800), and at four follow-ups until year 2002. Diagnoses of depression were based on DSM-III-R criteria and multiple sources of information were used. Birth-related factors were abstracted from original midwife records (n=803), and evaluated longitudinally in relationship to lifetime depression (*Paper I*). In 1992, a subsample of 84 women without dementia participated in lumbar punctures and CSF was analysed for biomarkers. Levels of biomarkers were assessed cross-sectionally in relationship to depression (*Paper II and III*).

**Results:** *Paper I* showed that 44.6% (n=358) of women experienced any lifetime depression. Birth weight  $\leq 3500$  gram and shorter gestational time were independently associated with a higher odds of any lifetime depression. *Paper II* showed that compared to women without depression (n=70), women with Major Depressive Disorder (MDD) (n=11), had higher levels of Amyloid beta-42 (A $\beta$ 42), and the CSF/serum albumin ratio. *Paper III* showed that women with MDD (n=11) had higher levels of Neurofilament Protein Light (NFL). A multivariate model showed that each biomarker was independently, and as a CSF biomarker profile, positively associated with MDD.

**Conclusion:** Lower than median birth weight and shorter gestational time, higher levels of CSF A $\beta$ 42 and CSF NFL, and higher CSF/serum albumin ratio, were positively associated with depression in women. These results may suggest involvement of neurodevelopmental, neurodegenerative, and vascular factors in the pathophysiology of depression, potentially supporting a stress-related hypothesis of depression.

**Keywords:** Depression, women, epidemiology, etiology, life course, biological factors, cerebrospinal fluid, biomarkers, birth-related, population-based, PPSW

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