

Associations between depression and brain structure across the lifespan: Preliminary results from the European Lifebrain consortium

Binnewies J¹, Nawijn L¹, Walhovd KB², Ebmeier KP³, Penninx BWJH¹, Lifebrain Consortium

¹*Department of Psychiatry, Amsterdam UMC, Vrije Universiteit Amsterdam*

²*Center for Lifespan Changes in Brain and Cognition, University of Oslo, Norway*

³*Department of Psychiatry, University of Oxford, United Kingdom*

Background: Depression diagnosis is associated with decreased prefrontal thickness and hippocampal volume. Less is known about these associations in the general population and across the lifespan. We investigate associations between (subclinical) depression and brain structure, and moderating effects of age and sex.

Methods: We included 1870 participants between 18 and 85 years old from 3 sites (UK, Norway, Netherlands) of the European Lifebrain consortium. Meta-analyses were performed, calculating per-site and pooled effect sizes for associations between mild/moderate depression and Freesurfer-derived rACC, mOFC thickness or hippocampal volume. In ongoing analyses, we include additional cohorts (Spain, Germany, Sweden, UK, Denmark; final N~3500) and explore the effects of age and sex.

Results: 374 participants met criteria for mild-to-moderate depression, with 181 meeting criteria for moderate depression. Mild-to-moderate depression (vs. no depression) was not significantly associated with rACC (Cohen's $d=-0.090$) or mOFC ($d=-0.114$) thickness, or hippocampal volume ($d=0.018$). Similarly, moderate depression was not significantly associated with rACC ($d=-0.164$) or mOFC thickness ($d=-0.088$), or hippocampal volume ($d=-0.012$).

Conclusions: Mild or moderate depression was not associated with medial prefrontal thickness, or hippocampal volume, although effect-sizes for medial prefrontal areas were similar to previous observations in the ENIGMA consortium. However, associations with hippocampal volume were not in line with earlier ENIGMA findings, potentially due to few participants with moderate depression. Of relevance, earlier studies often had a more limited age range, and associations might change across the lifespan. Therefore, in ongoing analyses we investigate potential moderating effects of age which will be presented at the conference.