

 Inhalt archiviert am 2024-06-18



Impact of Prenatal Stress on BRAIN AGEing

Berichterstattung

Projektinformationen

BRAINAGE

ID Finanzhilfvereinbarung: 279281

[Projektwebsite](#) 

Projekt abgeschlossen

Startdatum

1 März 2012

Enddatum

28 Februar 2017

Finanziert unter

Specific Programme "Cooperation": Health

Gesamtkosten

€ 3 880 676,80

EU-Beitrag

€ 2 998 420,00

Koordiniert durch

UNIVERSITÄTSKLINIKUM JENA



Germany

Final Report Summary - BRAINAGE (Impact of Prenatal Stress on BRAIN AGEing)

Executive Summary:

The increased incidence of age-related brain diseases with longevity poses not only health but also social and economic problems in today's society. There is considerable concern amongst political leaders and the society in general that costs relating to the health and social problems of an increasingly ageing society could hugely challenge the European social and health insurance systems in the coming years. Hence innovative scientific solutions and advances which can quickly be translated into preventive and therapeutic strategies for early brain ageing and brain age-related disorders are urgently called for. Based on our own studies and on work by others, the BrainAGE consortium believes that prenatal stress influences brain health and disease in later life and analysis of this process is the key to identification of

novel therapeutic procedures.

Our main hypothesis was that brain ageing is due to an increased individual stress sensitivity programmed following exposure to different exogenous and endogenous stressors during intrauterine life. Exposure of the fetus to increased maternal stress hormone levels is attributable to three main maternal factors: psychological stress, treatment with glucocorticoids and undernutrition.

BrainAGE aimed to identify the effects of these prenatal stress factors (maternal psychological stress, glucocorticoid exposure and malnutrition) on brain development and ageing as well as on age-associated brain disorders such as stroke and cognitive decline. We determined mechanisms linking early human development and ageing using molecular biological and genetic approaches and translated experimental results by using non-human primates into the human situation. We explored the efficacy of an early interventional approach based on lifestyle changes of the pregnant mother and of a late pharmacological interventional approach in rodents as a base for interventional human studies. Preventing early brain ageing also has an impact on reducing brain-related diseases, such as stroke. Noticeably, BrainAGE strongly emphasized a gender specific examination of processes since stress sensitivity varies between sexes.

The results achieved in the project have shown (I) that prenatal stress programs structural and functional brain development and early cognitive decline as well as the outcome of stroke; (II) the extent to which the different types of prenatal stress program early brain ageing; (III) that epigenetic changes of growth hormone and glucocorticoid receptor genes increased stress sensitivity and metabolic changes are key mediators connecting developmental modifications to brain development and ageing; (IV) that a prenatally programmed increased cerebrovascular tone contributes to the decreased stroke outcome; and (V) positive effects of early and late interventional approaches. (VI) BrainAGE developed and provides innovative MRI-based, neurocognitive and molecularbiological strategies to detect early brain ageing by measuring the biological brain age compared to the chronological age.

Overall, we have obtained a better understanding of the impact of various prenatal stressors, and have achieved an enhanced detection of subtle changes in brain development and ageing. BrainAGE make available new knowledge relating to the early environmental stimuli that should be avoided at particular times of human development. This knowledge will enable us to make recommendations to scientists, public health policy makers, and health professionals to empower and educate women to attempt to avoid adverse effects of prenatal stress hormone exposure. Our findings will enable policy makers to develop specific public health policies, and increase public awareness with regard to ameliorating the ageing process and thus, allowing a better integration of an ageing community into society. In this context, we organised and carried out the first conference on the topic of prenatal stress and brain aging bringing together leading scientists to discuss various aspects of the topic and to plan future directions of research for a healthier brain aging. We have summarized the results from BrainAge in a special issue of the Journal "Neuroscience and Biobehavioural Reviews". These and other dissemination in particular to the general public on knowledge on vulnerable periods and adverse environmental stimuli during pregnancy will raise public awareness Finally, our results can rapidly be transferred to relevant health policies at the European as well as the global scale and will make significant contributions towards reducing disease burden and in turn the financial burden on both health care providers and health care systems.

Project Context and Objectives:

Summary description of the project context and the main objectives

See pdf attachment
Project Results:
Main S & T results/foregrounds

See pdf attachment
Potential Impact:
Potential impact and the main dissemination activities and the exploitation of results

See pdf attachment
List of Websites:
www.brain-age.eu/

Verwandte Dokumente



[final1-brainage-final-report-with-header-05-07-2017-finalised.pdf](#)

Letzte Aktualisierung: 13 September 2017

Permalink: <https://cordis.europa.eu/project/id/279281/reporting/de>

European Union, 2025