Biomarker Development for Postoperative Cognitive Impairment in the Elderly

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Principal Investigators
Institution
Contact information of lead PI
Country

European Commission

Title of project or programme

Biomarker Development for Postoperative Cognitive Impairment in the Elderly

Source of funding information

European Commission FP7-Seventh Framework Programme

Total sum awarded (Euro)

€ 5,982,400

Start date of award

01/02/2014

Total duration of award in years

5.0

The project/programme is most relevant to:

Alzheimer's disease & other dementias

Keywords

Research Abstract

Postoperative delirium (POD) is characterized by the progressive deterioration of sensory/cognitive function after surgery with incidences of up to 30-80%. It is frequently followed by postoperative cognitive dysfunction (POCD) which tends to persist over time. In elderly patients, POCD resembles chronic dementia and appears to accelerate the cognitive decline in Alzheimer dementia. POD is strongly associated with subsequent dementia after 3.2 and 5.0 years of follow-up: odds ratio = 12.52 [95% CI, 1.86-84.21] corrected for baseline dementia, severity of illness, age. In an aging society like the EU, the socioeconomic implications of POD/POCD are therefore profound. At present no treatment exists and there are no established molecular or imaging biomarkers that allow risk and clinical outcome prediction. We will establish valid biomarkers panels for risk and clinical outcome prediction of POD/POCD in

N=1200 surgical patients according to the regulatory requirements of the European Medicines Agency. Thus, a valuable database will be created not yet existing worldwide. Neuroimaging investigations, which directly provide information on brain structure/function, will include structural magnetic resonance imaging (MRI), diffusion tensor imaging (DTI), arterial spin labelling (ASL), functional magnetic resonance imaging with simultaneous electrophysiology (fMRI/EEG) and glutamate MR-spectroscopy (MRS). These investigations will be complemented by genetic/gene expression analyses (sequencing of cholinergic candidate genes/corresponding transcripts) and analyses of plasma and cerebrospinal fluid markers (inflammatory/metabolic). Supported by bioinformatics approaches, integration of neuroimaging data with knowledge from molecular biomarkers (multivariate expert system) is expected to allow patient stratification. This will greatly support decision-making before surgical intervention (balancing benefits and risks) as well as the development of novel therapies in POD/POCD.

Lay Summary
Further information available at:

Types:
Investments > €500k

Member States:
European Commission

Diseases:
Alzheimer's disease & other dementias

Years:
2016

Database Categories:
N/A

Database Tags:
N/A