INPLASY PROTOCOL

Corresponding author:
Longbin Jia

sxjcjlb@163.com

Author Affiliation:
Changzhi Medical College, Changzhi, China.

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Neurofilament Light Chain in Cerebrospinal Fluid or Blood as a Biomarker for Mild Cognitive Impairment: A Systematic Review and Meta-Analysis

Zhang, J[1]; Cheng, H[2]; Jia, L[3]; Liu, W[4]; Song, Y[5].

Review question / Objective: To assess the utility of NFL in blood and cerebrospinal fluid (CSF) as a biomarker in patients with MCI.

Condition being studied: Mild Cognitive Impairment(MCI), as the symptomatic predementia phase on the continuum of cognitive decline, is characterized by objective impairment in cognition, which is not sufficiently severe to require help with daily living's normal activities. In order to earlier diagnosis and interference, the bulk of MCI was performed in recent years hoping to avoid the progressing from MCI todementia. Neurofilaments are neuronal-specific intermediate filaments determining the axonal caliber. Due to a limitation in the method of measurement, the sensitivity of Neurofilament light chain(NFL) was unreliable. Until the most recent 5-year, the number of studies on NFL of MCI has been risen owing to the more sensitive assay.

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 25 August 2021 and was last updated on 25 August 2021 (registration number INPLASY202180101).

INTRODUCTION

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METHODS

Participant or population: Patients with mild Cognitive Impairment.

Intervention: None.

Comparator: Healthy controls.

Study designs to be included: Retrospective case-control study.

Eligibility criteria: The definitions for MCI and controls were adequate, NfL was detected in CSF, serum or plasma in subjects with MCI and the control group, and published in English.

Information sources: PubMed, Web of Science, and Embase.

Main outcome(s): The levels of NfL in mild cognitive impairment(MCI) and healthy controls.

Quality assessment / Risk of bias analysis: The study quality of the included studies was evaluated according to the Newcastle-Ottawa Scale scoring from 0 to 9, and a higher score stands for better quality.

Strategy of data synthesis: The individual means and SD were analysed to estimate standardised mean differences in NfL level between comparators (with 95% CI, and corresponding p value). Fisher's Z test was used to combine the overall effect on the basis of the correlation coefficient and

sample size. P value less than 0.05 was considered as significant. If the I2 statistics of the heterogeneity of the studies was less than 40%, the fixed effect meta-analysis model was chosen. If the I2statistics was more than 50%, the random effect model was applied.

Subgroup analysis: Subgroup analysis was conducted according to ethnicity, sample style, and NfL analysis methods.

Sensitivity analysis: Sensitivity analysis were conducted by omitting a single stduy in each.

Language: English.

Country(ies) involved: China.

Keywords: mild cognitive impairment, neurofilament light chain, Biomarkers, meta-analysis.

Contributions of each author:
Author 1 - Jing Zhang.
Email: 15706297397@163.com
Author 2 - Hongjiang Cheng.
Author 3 - Longbin Jia.
Email: sxjcjlb@163.com
Author 4 - Wei Liu.