J Alzheimers Dis Parkinsonism 2018, Volume 8
DOI:10.4172/2161-0460-C3-043

Perinatal asphyxia may influence the level of β-amyloid (1–42) in CSF

Torkil Benterud
Drammen Hospital, Norway

Importance: This is the first study indicating a possible correlation between perinatal asphyxia and Alzheimer´s disease, later in life.

Objective: Total tau (t-tau), phosphorylated tau (p-tau) and β-amyloid (1–42) (Aβ42) in CSF are useful biomarkers in neurodegenerative diseases. The aim was to study the role of these and other CSF biomarkers (t-tau, p-tau, Aβ42, S100B and neuron-specific enolase-NSE), during hypoxia-reoxygenation in a newborn pig model.

Design: 30 newborn pigs were included. One control group (n=6) and two experimental groups (n=24) were exposed to global hypoxia (8% O2) until BE reached -15 mmol/l (moderate hypoxia) or -20 mmol/l (severe hypoxia) or mean BP fell below 20 mmHg. CSF was collected 9.5 hours after the intervention. The study was conducted between October 2012 and January 2013.

Results: The level of Aβ42 in CSF was significantly lower for the pigs exposed to severe hypoxia compared with the control group, 922 (SD+/-445) pg/ml vs. 1290 (SD+/-143) pg/ml, ($p<0.05$) and there was a non-significant tendentious reduction of Aβ42 in the group exposed to moderate hypoxia. Regarding t-tau and p-tau, there were no significant differences between the intervention groups and the control group. A significantly higher level of S100B was observed in the CSF of pigs receiving hypoxia than in the control group. Further on, there was a moderate negative correlation between the levels of Aβ42 and S100B in CSF, as well as a moderate negative correlation between lactate in blood at the end of hypoxia and Aβ42 in CSF

Conclusion & Relevance: The reduced level of Aβ42 in CSF could reflect an effect on neurons after neonatal hypoxia and may indicate that perinatal hypoxia could be a risk factor for Alzheimer´s disease later in life. These findings show that CSF Aβ42 and S100B are significantly changed in neonatal pigs subjected to hypoxia compared to controls, thus they may be valuable biomarkers after perinatal asphyxia.

torkilben@yahoo.no

Notes: