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Prothrombotic factors in Neonatal Arterial Ischemic Stroke (NAIS) and predicting outcome after NAIS by mean of CSF-NSE levels and early multimodal MRI

Symptomatic Neonatal Arterial Ischemic Stroke (NAIS) refers to a perinatal ischemic stroke (revealed by brain imaging) with clinical signs; mainly focal seizures. NAIS is surprisingly common, affecting near 1 in 4,000 neonates at birth and produces a significant morbidity and long-term neurologic deficits.

Methods: We performed a multicenter observational prospective study in which 66 neonates more than 35 weeks of gestational age and NAIS were included between 2006-2016. The objectives of this study were: 1) to investigate the pathogenic factors of NAIS (particularly prothrombotic factors), 2) to generate a distribution map based on early MRI data, 3) to analyze the relationship between CSF-NSE levels and brain lesions in neuroimaging (topology and volume), as well as the correlation between both biomarkers with the outcome at two years of age.

To examine the role of family history, maternal diseases and thrombophilia, 129 controls were recruited prospectively. The correlation between cortico-subcortical lesions and outcomes in motor, cognitive function and language function and epilepsy was performed by means of voxel-based lesion-symptom mapping technique.

Results: Thrombophilia, maternal diseases and thromboembolic events in the families did not differ between cases and controls.

The region posterior to the central sulcus was the most frequently affected in NAIS (71%) and this explains the reason that functional alterations related to language were the most prevalent outcome (40%).

CSF-NSE appears to be an early biomarker after an NAIS due to there was a relation between size, arterial territory of the infarct, and neurodevelopment at two years of age. Outcome at two years correlated well with infarct volume and topology. While descending corticospinal tracts diffusion-weighted MRI signal is predictive of motor outcome, cognitive function was mainly correlated with Stroke volume, being the most important cognitive predictor the stroke involving main branch MCA.

Biography

Alfredo Garcia-Alix, completed his doctorate in 1990 at the Autonomía University of Madrid. He began his training as a pediatrician in 1982 at the Children's Hospital La Paz in Madrid and spent a year and half (1988-1989) training in Neonatal Neurology in the Department of Neurology of the Children's Hospital of San Luis, University of Washington. In addition to work in the field of neonatal neurology since 1990, at present he is the president of NeNe Foundation, a non-profit organization that seeks to promote the development of neonatal neurology. He has been associate professor of pediatrics at Autonomía University in Madrid and actually he is associate professor at the University of Barcelona. He has published more than 100 articles registered in the Pubmed and is an honorary professor at the Universidad de Concepción, Chile.

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