AEPC-YIA Session

2025年7月10日(木) 13:50 ~ 14:50 第2会場（文化会館棟 1F 中ホール）

AEPC-YIA Session（I-AEPCYIA）

Chair:Hiroyuki Yamagishi（Tokyo Metropolitan Children's Medical Center）
Chair:Nico Blom（Center for Congenital Heart Disease Amsterdam-Leiden, Leiden University Medical Center, Leiden / Amsterdam University Medical Center, Amsterdam, The Netherlands）

[I-AEPCYIA-6] Brain-Derived Neurotrophic Factor A Promising Neuromarker for Psychomotor Developmental Impairment in Children with Unrepaired Congenital Heart Defect

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INTRODUCTION:In patients with congenital heart defects (CHD), psychomotor delay is frequently detected (20-50% of cases), not only in those with cyanogenic malformations but also in those with normal cerebral tissue oxygenation (non-cyanogenic malformations). The aim of the study was to assess the predictive value of neuromarkers for psychomotor performance of CHD patients.
METHODS:This cross-sectional study included children aged 0-6 years with CHD who had not undergone treatment (interventional or cardiac surgery). Children with known factors that could affect psychomotor development such as prematurity, perinatal asphyxia or genetic syndromes, were excluded. Psychomotor development was evaluated using Denver Developmental Screening Test II (DDSTII). Blood samples were collected for neuromarkers analysis: neuron-specific enolase (NSE), protein S100 (pS100), brain-derived neurotrophic factor (BDNF) and glial fibrillary acidic protein (GFAP).
RESULTS:We enrolled 77 children who had normal development based on pediatric examination and were subsequently thoughtful evaluated through DDSTII. Patients with CHD experienced more frequent developmental delays compared to healthy children (56% in the non-cyanotic group and 97% in the cyanotic group). The association between type of CHD (cyanotic or non-cyanotic) and psychomotor impairment was statistically significant ($p<0.0001$, RR=2.604, CI=2.07-3.26).
Neuromarker values were compared between cyanotic and non-cyanotic groups: NSE and BDNF values were higher in the cyanotic group, while pS100 and GFAP values were slightly higher in the non-cyanotic group, though without statistical significance. Only BDNF showed a positive significant correlation with psychomotor development ($r=0.35$, $p=0.023$). An AUC of 0.72 was obtained for psychomotor development and BDNF in ROC

analysis, with a cut-off value of 5895 pg/ml. Multivariate analysis using a multiple logistic regression model indicated that none of the independent variables tested had a statistically significant relationship with BDNF levels.
CONCLUSIONS:Among the studied neuromarkers (NSE, pS100, BDNF, GFAP), only BDNF demonstrated moderate discriminative ability in predicting psychomotor development outcomes in pediatric patients with CHD. In this pilot study, BDNF shows promise, but further studies are needed to assess its clinical significance and potential applications.