



RELATIONSHIP BETWEEN BRAIN DERIVED NEUROTROPHIC FACTOR (BDNF) AND COGNITIVE FUNCTION IN CHILDREN WITH CEREBRAL PALSY

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ABSTRACT

Background: Cerebral palsy (CP) is the leading cause of childhood disability and commonly affecting cognitive function. Brain neuroplasticity for recovery after brain injury as the underlying cause of CP can be affected by genetic factor, neurotrophic factor, drugs, and age. Brain derived neurotrophic factor (BDNF) as one of neurotrophic factor plays role in brain plasticity. Studies show that BDNF could affect cognitive function. However, relationship between BDNF and cognitive function in children with CP has never been studied before.

Objective: To explore the relationship between BDNF and cognitive function in children with CP.

Methods: A cross sectional study were carried from June to November 2014 among children with CP Gross Motor Function Classification System (GMFCS) level I and II, range of age 4-14 years old, and meeting the inclusion criteria. BDNF serum level measured by Enzyme-Linked Immunosorbent Assay (ELISA) and cognitive function examination using Wechsler Preschool and Primary Scale of Intelligence-Revised (WPPSI-R) or Wechsler Intelligence Scale for Children-III (WISC-III). Full Scale IQ (FSIQ) were then grouped according to mental retardation criteria from World Health Organization (WHO) 1994. Analysis were performed using One Way Anova test.

Results: One hundred and fifty children with CP fulfilled the inclusion criteria, mean age is 9.62 (± 2.96) years old, most of the subjects were male (61.33%). Mean BDNF were 39.505 (± 12.284) pg/ml, mean IQ were 48.51 (± 18.33). Most children with CP (66%) have moderate and severe mental retardation. Statistically, BDNF were not correlated with cognitive function in children with CP ($p=0.99$).

Conclusion: There were no relationship between BDNF serum level and cognitive function in children with CP.

Key Words: BDNF, Cognitive function, Cerebral palsy

BACKGROUND

Cerebral palsy (CP) describes as a group of permanent disorders of the development, movement, and posture, it causing activity limitation, that are attributed to non progressive disturbances that occurred in the developing fetal or infant brains. Motor disorders in CP are often accompanied by disturbances of sensation, perception, cognition, communication, behaviour, epilepsy and secondary musculoskeletal

problems.¹ Cerebral palsy is the most common neurodevelopmental disability in childhood, world prevalence ranging from 2 to 2,5 per 1000 live births.² No data available about current CP prevalence in Indonesia. Most children with CP have associated comorbidities affecting their quality of life. Cognitive impairment often reported, it is noted in approximately 40-65% of all children with CP.³ Structural brain lesion, mainly white matter lesion predicts the degree of cognitive impairment.⁴ Cognitive function affected not only

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