Association between type of cerebral palsy and the cognitive levels

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Abstract

Background: Cerebral palsy is the main cause of physical disability during childhood. Assessment is necessary to acknowledge the level of intelligence of the patients and to prevent impairments in order to plan the prompt intervention.

Objectives: To evaluate the cognitive levels of cerebral palsy and association between cognitive levels and its types.

Methods: We conducted a cross-sectional study on subjects from Sekolah Luar Biasa Negeri 3 Yogyakarta. Intelligence was measured using the Stanford-Binet intelligence scales, whereas diagnosis of cerebral palsy was based on criteria of the American Academy for Cerebral Palsy (AACP). Data were analyzed using chi-square test.

Results: Among the 70 children with cerebral palsy, 78% had mental retardation in several cognitive levels. Children with spastic diplegia type had IQ level that equals to mental retardation. Children with athetoid type had borderline IQ level.

Conclusion: Our data showed that most patients with cerebral palsy had mental retardation of several cognitive levels but there was no significant association between each type of cerebral palsy with cognitive levels. [Paediatr Indones. 2009;49:186-8].

Keywords: cerebral palsy, children, cognitive level

Over the last twenty years, the problems of human development, behavior, and psycho-social have been highlighted and put forward as a new morbidity. One of the human development problems that come to interest is cerebral palsy, because it is one of the main cause of impairments during the childhood. The prevalence of cerebral palsy is 1.5–2.5 per 1000 live-births; cerebral palsy most frequently found in very low birth weight infants. Patients with cerebral palsy suffer from all limitations caused by the disabilities of which will affect their either micro- or macroconditions. Nonetheless, cerebral palsy patients with mental retardation will burden their families in microenvironment, societies, and nation in economical, psychological, or social terms. Therefore, evaluation should be conducted to figure out the intelligence and prevents further impairments in cerebral palsy children to plan the prompt intervention.

Studies on the association between types of cerebral palsy and cognitive levels have resulted in...
We classified the cognitive levels into two categories: mental retardation and non-mental retardation that consisted borderline, normal, and superior. The association between type of cerebral palsy and cognitive levels could be seen in Table 2.

Table 2. Association between type of cerebral palsy and cognitive levels

| Type of cerebral palsy | Superior-borderline (70-140) | Mental retardation (<70) |
|------------------------|------------------------------|-------------------------|
| Hemiplegia             | 0                            | 1                       |
| Spastic diplegia       | 1                            | 5                       |
| Spastic quadriplegia   | 8                            | 7                       |
| Athetoid               | 2                            | 11                      |

$X^2 = 5.957; df = 3; P = 0.114$

In general, there were 24 subjects with cognitive level of mental retardation. There were no subject with normal cognitive level. Only one subject had a superior cognitive level, and the rest were borderline. There was no association found between types of cerebral palsy and cognitive levels ($P = 0.114$).

**Discussion**

According to the types of motor dysfunction, cerebral palsy is classified into: (1) spastic type (70-80%), (2) diskinetic type (10-15%), and (3) ataxic type (<5%), in which the spastic type is the most frequent. This was similar with this study; 22 subjects were cerebral palsy of spastic type, hemiplegia, spastic diplegia, and spastic quadriplegia and the other 13 suffered from dyskinetic (athetoid).

Male subjects were more than females (21 vs 14 = 2:3). From each type of cerebral palsy, male subjects were also more than females. However, it is generally believed that gender has no role on the development of cerebral palsy. Rambe et al$^8$ conducted a study on 74 children with cerebral palsy, 28 boys and 46 girls. This study resulted in 42% of spastic type of cerebral palsy implied in mild mental retardation, 67% of hypotonic type in moderate mental retardation, and 75% with dyskinetic in moderate mental retardation, and 100% of mixed type of cerebral palsy in severe mental...
retardation. Our results were in line with Hutton and Pharaoh’s study\textsuperscript{16} which stated prevalence of cerebral palsy children who suffered from mental retardation was 50-70\%. This might support relationship between damage location inside the brain and types of cerebral palsy which also determine the type.

Our study showed no relationship between type of cerebral palsy and the cognitive levels. This is different with the study done by Rambe et al who demonstrated a relationship between the type of cerebral palsy and the cognitive levels. In conclusion, with the limited number of patients, this study indicates that most of the patients with cerebral palsy have mental retardation of cognitive levels but there is no relationship between the type of cerebral palsy and the cognitive levels.

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