An illustration of speech articulation impairment in children with cerebral palsy tested by the Goldman-Fristoe method (Conducted at the SLB-D School for Disabled Children Bandung in 2007)

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ABSTRACT

Seventy percent of children with cerebral palsy were found to suffer from speech articulation impairment. The purpose of this research was to obtain an illustration of speech articulation impairment in children with cerebral palsy tested by the Goldman-Fristoe method at the SLB-D School for Disabled Children Bandung in 2007. This was a descriptive research. Sampling was carried out by purposive sampling. The speech articulation impairment test was carried out on the basis of the Goldman-Fristoe method, that is, an articulation test which places the consonant at the beginning, middle, and at the end of a word, to test speech articulation impairment in children with cerebral palsy. Research results indicated that speech articulation impairment in the bilabial consonants /p/,/b/, and /m/ are on the average 85.51%. Speech articulation impairment of the labiodental consonants /f/ and /v/ is an average 89.13%. Speech articulation impairment of the alveolar or dental consonants /t/ and /d/ is an average of 80.43%. Speech articulation impairment in the palatal consonants /c/ is an average of 82.60%. Speech articulation impairment in velar consonants /k/ and glotal consonants /h/ is an average of 86.96%. Research results indicated that more than three fourths of children with cerebral palsy at the SLB-D School for Disabled Children Bandung in 2007 suffered from speech articulation impairment.

Key words: Child with cerebral palsy, speech articulation impairment, Goldman-Fristoe method

INTRODUCTION

Cerebral palsy is a motoric function impairment due to brain damage which cause movement and body gesture disorder. Cerebral palsy could also come along with mental, epilepsy, hearing, visual, or speech impairment.[1]

Speech articulation impairment is one of the speech impairment which usually happens in childhood.[2] Speech articulation impairment could happen due to brain damage or physical disorder, eg. speech articulation impairment in cerebral palsy.[3] Speech impairment is found in about 70% of children with cerebral palsy including speech articulation impairment.[4] Koch and Poulsen[5] stated, more than 30% children with cerebral palsy have speech articulation impairment. National Institute of Neurological Disorders and Stroke[6] stated that about 20% children with cerebral palsy were unable to produce talking voice which can be understood.

One of speech impairment in children

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with cerebral palsy could be speech articulation impairment.[7] Children with cerebral palsy can easily produce spoken consonants like /b/,/m/,/v/,/d/ and /h/ rather than unspoken consonants like /p/,/t/,/f/,/c/ and /k/, other than that, consonants which produce by lips like /b/,/p/ and /m/ are easier to produce rather than consonants which need teeth, tongue and palate activities like /c/ and /d/.[8]

Goldman-Fristoe method is an articulation method test which aim to judge consonants articulation ability by placing consonant at the beginning, middle and at the end of the word. Goldman-Fristoe method can be conducted in children age 2-16 years old or more. Articulation test is conducted by using card with pictures and it consists of word test, sentence test and stimulus test.[9] Research about speech articulation impairment in children with cerebral palsy using Goldman-Fristoe method has never been conducted in Indonesia.

Children with cerebral palsy can be found in SLB-D School for Disabled Children Bandung which is located in Jalan Mustang 46 Bandung. SLB-D School for Disabled Children Bandung is an education foundation which serve, educate and guide handicapped children or children with physical defect in educational step covered from kindergarten, primary school, junior high school, senior high school and special school for autistic children. SLB-D School for Disabled Children Bandung service target include children with polio, cerebral palsy, meningitis, encephalitis and hydrocephalus, born-amputated children and autistic children. Children with cerebral palsy in SLB-D School for Disabled Children Bandung in 2007 amount to 48 children.

The purpose of this research is to obtain an illustration of speech articulation impairment in children with cerebral palsy by using Goldman-Fristoe method in SLB-D School for Disabled Children Bandung in 2007.

MATERIALS AND METHODS

This research uses descriptive method by using speech articulation test device modified by Goldman-Fristoe that is card with pictures. This research population is children with cerebral palsy in SLB-D School for Disabled Children Bandung using purposive sampling technique with some considerations which is children with cerebral palsy who aged 7-16 years old, cooperative during the research and was present during the research process whom accompanied by parents or teachers whom agreed to sign informed consent. Research took place in SLB-D School for Disabled Children Bandung which located in Jalan Mustang 46 in Bandung during June 2007.

Table 1. Mean percentage of speech articulation impairment in children with cerebral palsy in SLB-D School for Disabled Children Bandung in 2007.

Consonant	Mean Speech Articulation Disorder
Bilabial: /p/,/b/,/m/	85,51 %
Labiodental: /f/,/v/	89,13 %
Dental/Alv.: /t/,/d/	80,43 %
Palatal: /c/	82,60 %
Velar: /k/	86,96 %
Glotal: /h/	86,96 %

Subjects were asked to say words with bilabial consonant /p/,/b/,/m/, labiodentals consonant /f/,/v/, dental or alveolar consonant /t/,/d/, palatal consonant /c/, velar consonant /k/ and glottal consonant /h/by showing speech articulation test device modified Goldman-Fristoe i.e. card with pictures. Research was conducted by giving code from 0 to 9 using these criteria: (1) Consonant pronouncing could not be differentiate from normal prononuncing; (2) Consonant pronouncing is clear, but after being applied to words, deviation or distortion happened; (3) Consonant pronouncing is clear, but after being applied to words, there was changes in certain consonants or substitution; (4) Consonant pronouncing is clear, but after being applied to words, some consonants weren't prononunced or omition; (5) Consonant pronouncing is clear, but after being applied to words, there were certain consonant addition; (6) Consonant prononuncing is not clear, words, there was a particular consonant addition; (7) Consonant pronouncing is not clear, but after being applied to words, deviation or distortion happened; (8) Consonant pronouncing is not clear, but after being applied to words, there was changes in certain consonants or substitution; (9) Consonant pronouncing is not clear, but after being applied to words, some consonants

weren't prononunced or omition; (10) Consonant pronouncing is clear, but after being applied to words, there were certain consonant addition.

After that, code were groupped based on speech articulation impairment: (1) Distortion: Code 1, 5 atau 6; (2) Substitution: Code 2 atau 7; (3) Omition: Code 3 or 8; (4) Adition: Code 4 or 9. If one of the codes above exist, then the child is diagnosed with speech articulation disorder. Results were observed and recorded in examination form. Collected data are then analyzed. Research was performed in order to test the result using descriptive analysis. After that, data is processed in percentage distribution form and presented in tabulation.

RESULTS

Research was conducted to 23 children with cerebral palsy who fulfill the criteria as a sample. The research used Goldman-Fristoe method to obtain an illustration of speech articulation impairment in children with cerebral palsy. Speech articulation impairment was determined based on impairment which happen in bilabial consonant /p/,/b/,/m/, labiodental consonant /f/,/v/, dental or alveolar consonant /t/,/d/, palatal consonant /c/,velar consonant /k/ and glotal consonant /h/pronouncing. Research results were analyzed in percentage distribution form and presented in tabulation.

DISCUSSION

Children with cerebral palsy have motoric function impairment which can influence oral cavity's muscle and structure. This impairment causes a disability to lift up tongue, mandible or soft palate and difficulties in closing lips which needed to produce consonant sound.[8]

Table 1 shows that mean speech articulation disorder in bilabial consonant /p/,/b/ and /m/is about 85.51%. Mean speech articulation disorder in labiodentals consonant /f/ and /v/ is about 89,13%. Mean speech articulation disorder in dental or alveolar consonant /t/ and /d/ is about 80.43%. Mean speech articulation disorder in palatal consonant is about 82.60%. Mean speech articulation disorder in velar consonant /k/ and glotal consonant /h/ is about 86,96%.

These numbers matches Bakwin and Bakwin opinion[2], which stated that speech impairment happened in about 70% of children with cerebral palsy and one of it is speech articulation impairment.

Table 1 also matches Bluestone and Tool opinion[3] which stated that children with cerebral palsy were easier to produce spoken consonants like /b/ and /m/ rather than unspoken consonants like /f/ and /k/.

Factors which can influence speech articulation impairment in children with cerebral palsy are malocclusion, teeth loss or toothless, and speech organ form and structure malformation.

CONCLUSION

Based on the results, we can conclude that more than three fourths of children with cerebral palsy in SLB-D School for Disabled Children Bandung in 2007 suffers from speech articulation impairment.

It is suggested that further research should be conducted to observe speech articulation impairment in children with cerebral palsy with larger sample. Children with cerebral palsy whom suffered from speech articulation impairment were best rehabilitated very early and given intensive speech training in order to increase their speech ability so that comunication could be performed better

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