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Relationship between Neonatal Asphyxia and Exclusive Breastfeeding with Febrile Seizures in Children in the Bahteramas General Hospital, Southeast Sulawesi

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Abstract. According to the Institute of Health Consensus Conference, the occurrence of febrile seizures in infants and toddlers aged 3 – 5 years old is associated with fever without any evidence of infection or intracranial causes. Children with a high body temperature of 38⁰C (rectal temperature) are subject to febrile seizure. About 90% of febrile seizures sufferers are children under five years. In Indonesia, the prevalence of febrile is estimated to 2 – 4% while the data shown in Bahteramas Hospital during the past three years indicated an increased incidence of febrile seizures in as many as 17, 87, and 149 patients respectively in 2013, 2014, and 2015. The present study aimed to understand the relation between neonatal asphyxia and exclusive breastfeeding to the incidence of febrile seizures in children at Bahteramas Hospital, Southeast Sulawesi. This study is an analytical study with a case-control approach. The population of the study was mothers whose child suffering from febrile seizures in Mawar room from January to Mei 2016 as many as 105 patients, later 60 patients were enrolled in the study using an accidental sampling technique. The statistical analysis was made using an odds ratio and binary logistic regression. The results show that neonatal asphyxia (OR=4.750) and exclusive breastfeeding (OR=4.929) are associated with the incidence of febrile seizures in children. It is suggested for mothers to prevent their toddlers from asphyxia and promoting a 6-month exclusive breastfeeding practice to naturally boost immunity from febrile seizure.

INTRODUCTION

Children under five years are susceptible to diseases¹. At least, there are 10 disease symptoms generally experienced by toddlers. Thus, parents should be able to identify the common symptoms experienced by their child. As cited from a book by Su Laurent and Peter Reader “Your Baby Month by Month”, these several common symptoms are cough, diarrhea, asphyxia, earache, excessive

cry, fever, convulsion, rash, stomachache, and vomiting².

Febrile seizures are fits associated with fever symptoms and age without intracranial infection or abnormality. Meanwhile, fever is a spike in body temperature of more than 38⁰C rectal or more than 37.8⁰C axial³. Experts say children aged 3 months to 5 years old are susceptible to febrile seizures. Approximately

2-5% of children under five years experienced febrile seizures⁴. More than 90% of cases are found in toddlers. Most cases are found in children aged 6 – 22 months, with the highest incidence in children aged 18 months old⁵.

Febrile seizures can be categorized into two based on the phenotype and duration namely the simple febrile seizures (65%) and the complex febrile (35 %) ⁶. Several risk factors for febrile seizures including age, convulsion duration, and family history are known to be predictors for the neurological problem in the future^{7,8}.

In America and Europe, the prevalence of febrile seizures is about 2-5%, meanwhile, in Asia, the prevalence is double, approximately 8.3 – 9.9%. Febrile seizures are among the major neurologic disorders in children. The associated risk factors are fever, age, family history, prenatal history (mother's age during pregnancy), perinatal history (asphyxia, gestational age, and low birth weight)⁹.

In Indonesia, about 16% of toddlers suffered from neurologic and brain disorders such as convulsion, hearing disorders, macrocephaly, etcetera¹⁰. Boys are more susceptible to febrile seizure, about two times higher than girls.

Approximately 30-40% of toddlers experienced recurrence¹¹. In 2009-2010, about 2-4% cases of febrile seizures were reported¹².

A preliminary study conducted in Bahteramas General Hospital, Southeast Sulawesi in the past 3 years showed an increased incidence of febrile seizures in as many as 17, 87, and 149 patients respectively in 2013, 2014, and 2015. Meanwhile, in January - Mei 2016, 105 cases of febrile seizures were recorded.

METHODS

This study was an analytical observational study with a case-control approach. The dependent variable was the incidence of febrile seizures, while the independent variables were neonatal asphyxia and exclusive breastfeeding practices ¹³. This study was conducted in 2 months. The population of the study was mothers whose child suffering from febrile seizures in Mawar room and 60 patients were enrolled in the study using an accidental sampling technique. The statistical analysis was made through an odds ratio analysis.

RESULTS AND DISCUSSIONS

The relationship between asphyxia and the incidence of febrile seizures in Bahteramas Hospital, Southeast Sulawesi in 2017

Of 30 children with asphyxia in the case group, 19 children (63.3%) suffered from febrile seizures and the other 11 children (36.7%) did not. Correspondingly, in the control group, of 30 children with no asphyxia, 8 children (26.7%) suffered from febrile seizures and the other 22 (73.3%) did not.

Table 1.
Risk factor analysis of children with asphyxia to the incidence of febrile seizures in Bahteramas General Hospital, Southeast Sulawesi in 2017

Babies with asphyxia	Group				Total		95%CI		
	Case		Control		N	%	OR	Low	Upp
	n	%	n	%					
In risk	19	63.3	8	26.7	27	45.0	4.750	1.584	14.245
Not in risk	11	36.7	22	73.3	33	55.0			
Total	30	100	30	100	60	100			

Source: Primary data, 2017

The OR = 4,750, with lower limit of 1.584 and upper limit was 14.245 and the interval did not contain 1, and thus the OR is statistically significant. Therefore, asphyxia is a risk factor for febrile seizures in children. Correspondingly, children with asphyxia are 4

times higher in risk of suffering from febrile seizures than children with no asphyxia.

Hypoxia can cause impairment of inhibitor function and increased excitation function of neurons. So that if there is stimulation, seizures will easily occur. Asphyxia can cause lesions in the hippocampus that can become the focus of

epileptogenic. In cases of asphyxia, it can result in hypoxic ischemia, esefalopathy which causes neuropathological disorders. Neurological disorders that occur may include non-progressive neurological disorders such as seizures. Mental retardation and psychomotor development disorders. Hypoxia and ischemia can cause an increase in intracellular sodium resulting in brain edema which results in brain damage. Hypoxia sensitive areas such as the brain stem and thalamus whereas ischemia are the hemispheric regions of the brain¹⁴.

A study by Wijayahadi et al in Dr. Kariadi, Hospital Semarang with 164 respondents equally divided into both case and control groups showed that asphyxia is statistically known to be the risk factor for febrile seizures (OR=3.370)⁹.

The relationship between exclusive breastfeeding practices and the incidence of febrile seizures in Bahteramas Hospital, Southeast Sulawesi in 2017

The result of the present study showed that of 30 children in the case group, 18 (60%) children who suffered from febrile seizures did not receive exclusive breastfeeding, while the other 12 (40%) children received exclusive breastfeeding. Meanwhile, in the control group (with no febrile seizure), 7 (23.3%) children did not receive exclusive breastfeeding and the other 23 (76.7%) children received exclusive breastfeeding.

The risk factor analysis of exclusive breastfeeding practice to the incidence of febrile seizures can be seen in Table 2.

Tabel 2.
Risk factor analysis of children with no exclusive breastfeeding practices to the incidence of febrile seizures in Bahteramas General Hospital, Southeast Sulawesi in 2017

Breastfeeding Practices	Groups				Total		95%CI		
	Cases		Controls		N	%	OR	Low	Upp
	n	%	n	%					
Yes	18	60.0	7	23.3	25	41.7	4.292	1.612	15.071
No	12	40.0	23	76.7	35	58.3			
Total	30	100	30	100	60	100			

Source: Primary data, 2017

Table 2 shows an OR= 4.292, with lower and upper limits are 1.612 and 15.071 respectively and did not contain 1, therefore the Odds Ratio is statistically significant. Thus, exclusive breastfeeding is a risk factor for febrile seizures in children. Correspondingly, children with no exclusive breastfeeding are 4 times higher in the risk of suffering from febrile seizures than children who have exclusive breastfeeding.

Immunity can be assessed by how often a child suffers from illness. Should a baby is getting sick easier, we should identify whether or not he received exclusive breastfeeding since the breastfeeding can provide various antibodies such Immunoglobulin A (IgA), IgG, IgM, IgD, and IgE that can protect children from pathogenic microorganism¹⁵.

A study by Firdinand et al at Kota Palembang Public Health Center which registered 146 respondents, that equally divided into case and control groups, showed that exclusive

breastfeeding practice associated with the incidence of febrile seizures (OR=3.336). children with no exclusive breastfeeding are 3 times higher in the risk of suffering febrile seizures than children who receive exclusive breastfeeding¹⁶.

CONCLUSIONS AND SUGGESTIONS

Based on the study conducted in Bahteramas Hospital, it is concluded that asphyxia and exclusive breastfeeding practices are known to be the risk factors for febrile seizures in children. It is recommended to identify other risk factors of febrile seizures in the future study as well as how to make the first aid of febrile seizures in children.

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