

DIARRHEA IN CHILDREN CAUSED BY SALMONELLA Sp

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Abstract

Salmonella Sp is a common enteric pathogenic bacterium with a high prevalence as a cause of diarrhea in Indonesia. The objective of this study to detect Salmonella sp in children. This study used a qualitative descriptive method. The research subjects were 30 children with fever who were treated in the hospital ward of Bengkulu City. Samples were taken and examined at the Microbiology Laboratory of Poltekkes Kemenkes Bengkulu. The incidence rate of diarrhea caused by Salmonella sp infection in children in Kota Bengkulu is 30.8%, mostly in boys and in the age range 1-4 years. Clinical manifestations that can accompany Salmonella sp. is fever, vomiting and mucus stools. This study recommends parents who have children under five to understand the signs and symptoms of diarrhea in children, in order to responsive in prevention and providing assistance.

Key Words: Salmonella sp, diarrhea, infection, children

INTRODUCTION

Infectious disease is a disease that has suffered by many Indonesian people since the first, including intestinal infections (diarrhea). Diarrhea is a condition in which individuals have bowel movements three or more times per day with a soft consistency. This disease can be caused by various bacteria, viruses, and parasites. Transmission of diarrhea can be from contaminated food or drinking water, even from person to person as a result of poor personal hygiene and sanitation. Severe diarrhea can be fatal due to severe dehydration and the resulting nutritional deficiencies (Sumampouw, 2017) Diarrhea is the second leading cause of death (16%) after pneumonia in children under 5 years of age worldwide, especially in developing countries (WHO, 2015).

Bacterial species that cause diarrhea, namely: Staphylococcus aureus, Bacillus cereus, Clostridium perferingens, Escherichia coli, Vibrio cholerae, Shigella sp., Salmonella Sp., Clostridium difficile, Campylobacter jejuni, Yersinia enterolitica, Klebsiella pneumoniae, Vibrio haemolyticus al (Brooks et al. , 1996). Diarrhea cases in Indonesia are more often caused by Staphylococcus

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aureus, *Escherichia coli*, *Vibrio cholerae*, *Salmonella* sp., in addition to *Shigella* sp., and *Campylobacter* (Dzulkarnain, 1996). Common causes of diarrhea transmitted includes viruses, bacteria, protozoa and mixed infections were not identified, which are caused by bacterial pathogens *Salmonella* and *Shigella* are of particular concern as the cause enteric fever, food poisoning and diarrhea (Madigan, 2012),

Diarrhea caused by *Salmonella* is infection in the intestine and occurs more than 8-48 hours after the pathogen enters the host. The characteristics are fever, headache, vomiting, diarrhea, abdominal pain that lasts for 2-5 days. Loss of fluids and loss of electrolyte balance is a danger for children and parents (Wikswa, 2012). Children with diarrhea or other illnesses that cause vomiting, diarrhea, or low food intake are at risk of becoming dehydrated (Vafae, Moradi, Khabazkhoob, 2017). Diarrhea is one of the most common diseases in infants and children. The rate of hospitalization due to diarrhea for children under 5 years is reported as 9 per 1000 per year in the United States each year, while in the UK it is 12 per 1000 and in Australia it is 15 per 1000. In developing countries the number of hospitalizations due to diarrhea in children is 26 per 1000, for example in China (Fonseca, Holdgate, & Craig (2015).

Salmonella sp occupies the second position as a bacterial pathogen that causes gastroenteritis (diarrhea) with a figure of 15% in tropical countries (Bonfiglio, Simapore, Pignatelli, Musumeci, & Solinas, 2012) Research in Jordan showed *Salmonella* sp as the third cause of diarrhea-causing bacteria with a figure of 7.7% (Nimri, Elnasser, & Batchoun. 2014). Research by Jafari (2012).) in Tehran, Iran with research subjects under the age of 5 years, found that the prevalence of *Salmonella* sp infection was 7.6%. Hospitals in Indonesia found *Salmonella* sp.17.7% as the third most frequent pathogen as a cause of diarrhea after *Vibrio cholera* 37.1% and *Shigella* sp. 27.3% (Aidilifit, 2013). In relation to the incidence of diarrhea in various countries and in Indonesia in particular, it is considered important to conduct research on the incidence of diarrhea caused by *salmonella* sp in children who are hospitalized in Kota Bengkulu.

METHOD

Research Design and Subjects

The research used a qualitative descriptive method. The research subjects consisted of 30 pediatric patients aged 5 years with fever who came and were treated at the Bengkulu City Hospital. Sampling was carried out from October 2018 to January 2019.

Instruments and Data Analysis Techniques

Data were collected by first explaining to the subject's parents about this study and being asked to sign an informed consent form to participate as participants in the study prior to sampling and interviews. The data collected included age, gender and clinical symptoms related to diarrhea and other necessary data were collected using a questionnaire. Furthermore, the examination of stool samples was carried out at the Microbiology Laboratory of the Integrated Laboratory of the Health Polytechnic of the Bengkulu Ministry of Health.

RESULTS

The results of stool examination showed 5 (16.7%) stool samples were positive for Salmonella sp. while 25 (83.3%) stool samples were negative for Salmonella sp. The incidence of diarrhea in children with fever was found in 13 (43.3%) samples and no diarrhea in 17 (56.7%) samples. Stool samples were positive for Salmonella sp. 5 (16.7%) and 25 (83.3%) were negative for Salmonella sp. Salmonella sp. infection. found 2 (40%) in women and 3 (60%) in men.

Distribution of Salmonella sp. in children with fever, based on age and gender, the frequency of age less than 1 year was 8 (35.3%) and those aged more than 1 year were 22 (64.7%), female sex was 13 (43.3%) and male gender by 17 (56.7%). The data are presented in Table 1 below.

Table 1. Distribution of the Frequency of Diarrhea, Child Characteristics, and Salmonella sp in RSUD Kota Bengkulu

Variable	n	%
Diarrhea		
Diarrhea	13	43,3
No Diarrhea	17	56,7
Salmonella sp		
Positive	5	16,7
Negative	25	83,3
Age		
≤ 1 year	8	35,3
> 1 year	22	64,7
Gender		
Male	17	56,7
Female	13	43,3
Salmonella Sp		
Male	3	60
Female	2	40

Next, the incidence of diarrhea with positive Salmonella sp can be seen from Table 2 below, which was found to be positive for Salmonella sp in 4 (30.8%) children with fever with diarrhea. Based on age, children with fever with diarrhea were found to be 11 (84.6%) in children over 1 year old, and male (61.5%) had more diarrhea with fever than girls (38.5%).

Table 2. Salmonella sp., Child Characteristics and Diarrhea Incidence in RSUD Kota Bengkulu

Variable	Diarrhea		No diarrhea	
	Post diarrhea N %	%	N	%
Salmonella sp				
Positive	4	30,8	1	5,90
Negative	9	69,2	16	94,1
Age				
≤ 1 year	2	15,4	6	35,3
> 1 year	11	84,6	11	64,7
Gender				
Male	8	61,5	9	52,9
Female	5	38,5	8	47,1

DISCUSSION

Examination of stool samples in 30 children with fever with diarrhea who were treated at the Bengkulu City Hospital, 5 samples (16.7%) were positive for Salmonella sp. The results of this examination are in line with research conducted by Wikswo (2012), which reported an outbreak of acute diarrhea by the American national survey caused by the presence of Salmonella sp. as a foodborne pathogen. Most outbreaks that occur are related to food but can occur in hospitalized patients with undiagnosed diarrhea (Assefa & Girma, 2019). The same thing is supported by the research report of Aseefa and Girma (2019) conducted at the Robe General Hospital and Goba Referral Hospital, South East Ethiopia, where the prevalence of Salmonella sp. 6.9% in children aged 1 to 3 years which was significantly associated with Salmonella infection AOR= 19.08, 95% CI (2.68–135.86).

The incidence of diarrhea caused by Salmonella can occur through contamination of food and drink. In addition, the heavily polluted environment is very likely to provide favorable conditions for bacterial growth and support the faecal-oral spread of Salmonella sp. and Shigella sp (Savira & Anggraini, 2012). The difference in prevalence in various regions may be caused by differences in the sensitivity of the test method or culture.

The results of research conducted at the Bengkulu City Hospital, based on gender, 8 (61.5%) boys suffered more from fever with diarrhea than girls. This study also showed that infection with Salmonella sp. in the feces of children with fever with diarrhea, it was found in boys as many as 3 people (60%) for Salmonella sp. This can happen because boys are more active and play more in the outdoor environment so they are easily exposed to agents that cause diarrhea, one of which is Salmonella sp (Adisasmitho, 2017). The results of this study are in line with Eka's research (2016), where there is a relationship between the sex of the child and the incidence of diarrhea in children under five in Indonesia. Boys tend to be more active than girls, with stronger physical status allowing boys to move more with a wider range.

In this study the presence of Salmonella sp infection was found in the age range of 1-4 years as many as 4 people (80.0%). This is in accordance with research conducted by Aseefa and Girma (2019), where children in the age range of 1-3 years are more susceptible to diarrhea caused by Salmonella sp. This is in accordance with research conducted by Beyene & Tasew (2014) and Ameya, Tsalla, Getu, & Getu (2018) where children at this age are naturally very easy to be contaminated because they are in the oral phase, and have the habit of putting things in their mouth.

Surrounding items or holding contaminated soil, food and water and put it in their mouths, and this can cause microbial disease including *Salmonella* sp. pathogens from the environment will easily enter their bodies. This is also in accordance with the research of Vargas et al, (2014) where in children aged under 3 years there is still a lack of awareness of personal hygiene and environmental sanitation. Children under the age of five are susceptible to diarrhea, because children at that age have a lower immune system than older children. In addition, maybe because at this time children are introduced to various kinds of food and begin to actively play (Farthing, 2010)

CONCLUSIONS AND RECOMMENDATIONS

The incidence of diarrhea caused by *Salmonella* sp infection in children in Kota Bengkulu is 30.8%, most of which occur in children with age range of 1-4 years. Clinical manifestations that can accompany infection with *Salmonella* sp. are fever, vomiting and loose stools. This study recommends parents who have children who are still toddlers to understand the signs and symptoms of diarrhea in children, so that they are responsive in prevention and provide help.

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