IMMUNITY STATUS OF DIPHTHERIA FOR THE PRIMARY SCHOOL CHILDREN (7-12 YEARS OLD) POST NATIONAL IMMUNIZATION WEEK PROGRAM IN SURABAYA

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Diphtheria has become a serious health problem , especially in Southeast Asia . According to SEAR (South East Asia Regional) in 2011 cases of diphtheria Most came from Indonesia 91 %. Since 2011, East Java has become outbreaks of diphtheria. Therefore to overcome the widespread diphtheria outbreaks the National Immunization Week (Sub- PIN) which was held in 19 districts / cities in East Java. After the implementation of the Sub - PIN for children aged 2-15 years as a response to the outbreak , some factors influence the immune status of children. The Purpose is assest immunity level post Sub- PIN.
The method used was a descriptive cross- sectional study . Respondents were the students of primary school children who have to get a sub - PIN diphtheria. Measurement of immunity level to diphtheria antitoxin IgG levels by ELISA was measured.
There were 25 students agree as respondents . Immunity levels for students showed good results seen from all levels of IgG antitoxin demonstrated student value between 0.747 and 2.221 . This means that the status of immunity against diphtheria high and very high . Based on the results the students who have a higher immune status are boy, aged 8 years , with a normal nutritional status and have a complete vaccination history and no history of contact .
Further research may be conducted to identify the different result on the childrens who getsub-PIN and those who do not. for certain improvement of provision status of Immunity - PIN

Keywords : diphtheria , immunity status , elementary, sub – PIN

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INTRODUCTION

Diphtheria becomes a serious health problem, especially in Southeast Asia. According to a WHO report within a period of 28 years (1980-2008) diphtheria cases from Southeast Asia highest at about 90%, including Indonesia. According to SEAR (South East Asia Regional) mostly diphteria cases came from Indonesia many as 91%.[1]

Cases of diphtheria, especially in East Java tend to increase and spread every year. In 2008 there were 77 cases / 11 deaths, in 2009 there were 140 cases / 8 deaths, and in 2010 there were 304 cases / 21 deaths. The prevalence of diphtheria were in 2008 in 20 districts / cities, in 2009 in 24 districts / cities, and in 2010 in 31 districts / cities and s / d October 9, 2011 in 34 districts / cities.[2]

Case Fatality Rate (CFR) of diphtheria is high (7%) in 2010, but sometimes it could reach 50%. 74% of diphtheria cases in East Java occurred in the age of infants and Kindergarten and elementary school (<9 years). The increase of mortality from January to Juni 2010 (103 cases, 7 died, CFR 7%) was higher than in 2009 (63 cases, 3 died, CFR 4.8%). In 2011 diphtheria CFR o reached 3.3%.[2]

Surabaya was the third highest diphtheria cased until December 2012 was 72 cases. The number of diphtheria deaths reached 1.3%. In early November 2012 there was done to address the sub-PIN diphtheria diphtheria outbreak. Sub PIN diphtheria conducted in 19 districts / municipalities in East Java with the goal of all children aged 2-15 years.

Cases of diphtheria in Surabaya is increasing from year to year. Diphtheria not only affects children or patients with incomplete immunization status, but also complete immunization state. The occurrence of diphtheria in children with complete immunization status due to failure the formation of immunity. Immunity can not be formed due to several factors. By the reaction of antigen, antibodies will attacked foreign objects which enter and damage the body, but after a few months / years will be reduced due to an anti-converted by the body so that the body's immunity decreases. In addition, the vaccine is not appropriate dose, the use of vaccines that have been damaged and are not appropriate immunization can influence the formation of the body's immune failure despite being immunized. This is related with the quality of immunization services provided..

Lubis (2005) said above the status of diphtheria immunization by the schick test Kindergarten school at Medan saw there are difference antibody levels according frequency immunization. obtained in the field of vaccine received on the basis of differences in immunization provision amount. There are differences antibody level who get once times immunization than three times. The lower immunity influence of the occurrence of diphtheria.[3]

Surabaya is a city with the highest diphtheria cases in East Java. After the implementation of the Sub-PIN in children aged 2-15 years as a response to an outbreak, what the factors can influence the immune status of children at the primary after Sub PIN diphtheria. This study was conducted to describe the immune status of elementary school after the Sub PIN base on diphtheria antibody levels were established

METHOD

The method used in this study was an observational study using the analytic study design is cross –sectional. The population is equivalent of elementary school students who have obtained sub- PIN diphtheria. The way of collecting data used primary data by questionnaires and interviewers also measured height and weight to the nutritional state variables, measuring antibody titers to diphtheria immunity state variables. Diphtheria toxin antibodies were measured using enzyme- linked immunosorbent assay (ELISA). Measurement the level antibody titers, <0,01 IU / mL indicate no protection, while 0,01-0, IU/ml indicate partial protection or less protection, while 0,1 - 1,0 IU / mL indicate high protection and >1.0 IU/ml indicate very high protection[4].

RESULT

This study was conducted at one elementary school in the region of X health centers. Selection of health centers based on random sampling. Respondents in this study were parents of students Y Elementary School. Selection of students take classes 2, 3, and 4. Based on the

presence of students who have a previous history of diphtheria. Selection of students is done by random sampling. Respondents were obtained as many as 25 people, while the characteristics of the respondents are as presented in Table 1

Table 1. The characteristics of the respondents base on sex

Variabel	The Criteria of respondent					
	Laki- laki		Perempuan		Sum	
	N	%	N	%	N	%
Age						
7 years	1	7,7	1	8,3	2	8
8 years	7	53,8	4	33,3	11	44
9 years	5	38,5	4	33,3	9	36
10 years	0	0	3	25	3	12
Level of Nutrition						
Underweight	1	7,7	0	0	1	4
Normoweight	7	53,8	9	75	16	64
Overweight	3	23,1	3	25	6	24
Obesity	2	15,4	0	0	2	8
History of Vaccination						
Not Complete	7	53,8	5	41,7	12	48
Complete	6	46,2	7	58,3	13	52
History of Contact						
Yes	4	30,8	3	25	7	28
No	9	69,2	9	75	18	72

Based on data obtained characteristics of respondents aged 7-10 years, with the greatest number of 8 years of age. While the number of male respondents - male number of 12 children while female respondents were 13 children.

Levels of immunity students showed good results from all students. IgG antitoxin showed a number between 0.747 to 2.221. It is means that the status of immunity against diphtheria high and very high. There is little difference between the immune state based on sex. The male students tend to have higher levels of immunity that is 1.86 compared to female students only 1.68.

In addition, male students have more immune status is very high (54.4%) than female students (45.6%). Minimum levels of IgG dfteri for men student is 0.816 and 2221 difference with female student IgG diphtheria minimum 0.747 and maximum 0.178.(Table 2)

Table 2. Result Level of IgG diphteriae base on sex.

	Laki-laki	Perempuan	Total
Jumlah	12	13	25
Mean	1.86577	1.68367	1.77836

Median	1.97800	1.86200	1.90000
Mode	.816[a]	.747[a]	.747[a]
Std. Deviation	.356208	.455619	.408912
Variance	.127	.208	.167
Range	1.405	1.431	1.474
Minimum	.816	.747	.747
Maximum	2.221	2.178	2.221

Tabel 3 The Distribution Variabel according State of Imunity

Variabel	State of Imunity				Sum	
	High		Very High			
	n	%	n	%	N	%
Sex						
Boy	1	33,3	12	54,4	13	52
Girl	2	66,7	10	45,6	12	48
Age						
7 years	0	0	2	9,1	2	8
8 years	1	33,3	10	45,5	11	44
9 years	2	66,7	7	31,8	9	36
10 years	0	0	3	13,6	3	12
Level of Nutrition						
Underweight	0	0	1	4,55	1	4
Normoweight	2	66,7	14	63,7	16	64
Overweight	0	0	6	27,2	6	24
Obesity	1	33,3	1	4,55	2	8
History of vaccination						
Not Complete	2	66,7	10	45,5	12	48
Complete	1	33,3	12	54,5	13	52
History of Contact						
Yes	1	33,3	6	27,3	7	28
No	2	66,7	16	72,7	18	72

Based on the age of the majority students of have a very high immunity status was at the age of 10 years as many as 10 children (45.5%). While in high immunity status was at age 9 as 2 children (66.7%).

The majority of Nutritional status of respondent saw normoweight as many as 16 children (64%). However, there are underweight and obese. Based on nutritional status saw the high level of immunity for respondent with normoweight as 2 student and 1 studnet with obese status nutrition.

Children who have a complete vaccination history as 13 children, 12 of whom have very high immunity status. While children who have an incomplete vaccination history as many as 12 children, 2 of them high immunity status. Although some respondents had incomplete vaccination history but the immune status of high and very high. This is because all of the respondents are already getting vaccinated sub - PIN twice.

Children who had a history of contact with diphtheria patients were 7 kids in his class. 6 of them have very high immunity status. While there is no history of contact, there are 18 children. But most of the children that there is no history of contact and have a very high immunity status of as many as 16 children (64% of all respondents).

DISCUSSION

This study showed male student have higher immunity state is 1.866, on average, than female student on average 1.683. Although both can categorized very high immune state because it has immunity imuitas> 1,000 IU / ml.[4]

Nutritional status is one factor that affects the formation of immune state. In this study shows children with normalweight nutritional status has very high immunity status of most of 14 children (63.7%). According to Pereira (2003) Status of immunity is closely related to nutritional status, in addition to contributing to susceptibility to infection increases can also lead to poor nutritional.[5]

Status of immunity to diphtheria may be formed through passive immunity will not last long because it will be metabolized by the body, like as immunity to the infant at birth will decline.[6] Active immunity is made by the body itself, as a result of exposure to an antigen naturally or through immunization. Immunizations are given an active immunization by delivering bioactive substances known as vaccines, this action is called vaccination.

In this study, a complete vaccination history has a very high immune status at most 12 children (54.5%), while an incomplete vaccination history to have high immune status at most two children (66.7%). All children in this study had a high immunity status - is very high because of all the respondents were vaccinated sub- PIN twice the response to an outbreak of diphtheria which occurred in East Java.

The other study said the degree of protection against diphtheria reached 98% after the vaccination.[7] It should be observed factor related to immunity against diphtheria: The first is against diphtheria IgG levels can be decreased rapidly, can get to level without any protection in the first year. Second, the levels of IgG diphtheria depend on circulation C. Diphteriae in the community that that determines the level of clinical infection, subclinical or career. The intensity of infection crucial determine IgG anti-diphtheria titers. [8,9]

In this study, children who have a very high immune status and there is no history of contact with diphtheria patients is 16 children (72.7%). Children who had a history of contact with diphtheria patients have a greater risk of diphtheria compared with never-contact. However, our study saw children who have never had contact history shows very high levels of immunity.

CONCLUSION

Imunity State for Elementary student for male student higher than girls, Student with normoweight nutritional state, Complete vaccination history and no history of contact with diphteriae patient have very high immunity state after getting sub- PIN diphteriae.

There that need to be monitored regularlythe level immunity state after sub-PIN program. The further study needs to be a comparison between children who did not get a sub-PIN with which to get SUB-PIN that can be known with certainty increase immunity status was obtained from the provision of sub - PIN.

REFERENCES

1. WK, Bambang. (2012). *Situasi KLB Difteri di Jawa Timur.* Surabaya: Dinkes Prop Jawa Timur.
2. East Java Provincial Health Office (2011). Penyakit Difteri dan Situasi di Jatim. Surabaya. 5 Desember 2011. http://dinkes.jatimprov.go.id/userimage/dokumen/Data%20KLB% 20Difteri%20per%2024%20November%202011.pdf
3. Lubis, Bidasari. (2005) . Penelitian Status Imunisasi terhadap Penyakit Difteri dengan Schick Test pada Murid Sekolah Taman Kanak – Kanak di Kotamadya Medan. *e-USU Repository © 2005 Universitas Sumatera Utara*. 21 Nopember 2011.
4. Sutter RW,Hardy IR, Kolozva IA, Tchondannaia LM, Gluskevich TG, Marievsky V, dkk. (2000). Immunogenocity of tetanus difteri toxoid (Td) among Ukrainian adults: implication for diphtheria control in the NewlyIndependent States of Former Soviet Union. *J Infect Dis* , 181:S197-202.
5. Pereira, P. C. (2003). Interaction between infection, nutrition and immunity in tropical medicine. *Venom. Anim.Toxins incl. Trop.Dis* , vol 9 no 2 Botucatu
6. Matondang, G. J. (2011). *Pedoman Imunisasi di Indonesia.* Jakarta: Ikatan Dokter Anak Indonesia
7. Yulia Iriani; Carolina Fetri Kaharuba; Dian Puspita Sari; Mutiara Budi Azhar; Wisman Tjuandra; Zarkasih Anwar. (2012). Kadar Immunoglobulin G-difteri dan Tetanus pada Anak Sekolah Dasar Kelas Satu. Sari Pediatri , 14 (1):46 - 51.
8. Galazka AM1. Module 1: General Immunology. The immunological basis for immunization series. Geneva: WHO;1993. Didapat dari: http://www.who.ch/programmes/gpv/gEnglish /avail/gpvcatalog/catlog1.htm
9. Galazka AM2. Module 2: Diphtheria. The immunological basis for immunization series. Geneva: WHO; 1993. Didapat dari: http://www.who.ch/programmes/gpv/gEnglish /avail/gpvcatalog/catlog1.htm