ASSOCIATION OF PREGNANT WOMEN'S BEHAVIOR WITH FETAL RISK OF LEAD INTOXICATION: DISCUSSION ON PROBLEM IN RESEARCH METHODOLOGY

Tamri[1*], Iwan Tri Wibowo[2]

[1]Lecturer, Department of Public Health, Faculty of Health Sciences, Universitas Respati Indonesia
[2]Graduate, Department of Public Health, Faculty of Health Sciences, Universitas Respati
***corresponding author: tamris@ymail.com**

Abstract

Lead intoxication is one of the environmental problem causing a health problem. Fetal Risk of Lead Intoxication is the risk of the fetus to lead intoxication if the lead exists in the blood of pregnant women. The objective of the present study is to detect the association between knowledge and behavior of pregnant women with Fetal Risk of Lead Intoxication.The design type of study is cross-sectional; A sample size is all of 70 blood specimen of pregnant women examined in a laboratory. The statistical analysis uses an X square test.It shows that Fetal Risk of Lead Intoxication is 50%. There is an association between pregnant women's behavior ($p < 0.00$) with and no association between pregnant women's knowledge ($p > 0.325$) with Fetal Risk of Lead Intoxication.Health workers should educate pregnant women to avoid places or materials containing the lead.

Keywords : pregnant, behavior, fetal risk

1. INTRODUCTION

Heavy metals intoxication is one of the environmental problems which can damage human health. As one of developing countries, Indonesia is a very potential country for heavy metal intoxication because there is still low educated people and lack information concerning the danger of heavy metal. In general, heavy metal is a toxin, although some of them are useful in a small number. Contaminated air, water, food may distribute heavy metal to human where they are accumulated. If this situation is running continuously, the number of heavy metal will be maximal in the human body, and it is very dangerous for human health (1).

The lead is one of the heavy metals which is very toxic (2. The lead may enter human from many sources such as air, drinking the water flowing in the tube containing lead, battery, paint, cosmetics, soil, etc. Children may absorb 50% of lead, while adult people absorb 10-15% of lead. Children lead intoxication causes a decrease in intelligence and behavioral change. The lead also causes serious diseases for children such as cardiovascular diseases, and encephalopathy, and damaged hearing organ; the lead also causes behavior problems such as hyperactive, aggressive, difficult to study, and late growth (3).

Many people have been died every year because of air pollution from motor vehicle emission containing the lead. The government has a strategic position to control lead intoxication because of motor vehicle emission by formulating city regulation concerning motor vehicle which can run fluently, controlling lead pollution periodically, and to apply punishment for those violating

regulation. The local government of Jakarta as Capital City has Regulation Number 2 in 2005 concerning air pollution control. In Chapter 15 of Regulation, there is a statement that everybody or those responsible for business or activity causing air pollution is obligatory to conduct effort in air pollution control. However, the level of air pollution in a big city such as Jakarta has been in serious condition. In the first semester of 2016, the level of air pollution was 45ug/m3, namely 4.5 times the threshold confirmed by WHO (4). The lead may enter the human body including pregnant women in many ways. The fetus of pregnant women may be risky access to the lead through the placenta (5). As mentioned above that there is a serious problem of air pollution in Jakarta, a researcher found there is the lead in the blood of 113 pregnant women examined in one of many clinical laboratories in Jakarta (6). The objective of the present study is to detect the association of knowledge and behavior of pregnant women concerning exposed to the lead with Fetal Risk of Lead Intoxication. The definition of Fetal Risk of Lead Intoxication is the risk of the fetus to lead intoxication if the lead exists in the blood of the pregnant women concerned.

2. METHODS

Design type of study, It is a cross-sectional study to detect an association of behavior and knowledge of pregnant women with the fetal risk of lead intoxication. The place and time of studyIt is conducted in a Clinical Laboratory in Central Jakarta in July – August 2018. The population of the study is 113 pregnant women who followed the blood lead examination in a Clinical Laboratory in Jakarta. The sample is 70 out of 113 pregnant women mentioned above. The sample was taken by the accidental sampling procedure. In this case, the researcher found only 70 out of 113 pregnant women during the period of study from July to August 2018. The dependent variable is Fetal Risk of Lead Intoxication consisting of two categories namely 1) the risk of the fetus to lead intoxication when there is the lead in the blood of pregnant women and 2) No risk of the fetus to lead intoxication when there is no the lead in the blood of pregnant women. Data of the dependent variable was taken by blood examination for the lead. There are 2 independent variables namely behavior of pregnant women, and knowledge of pregnant women:

a. The behavior of pregnant women is the activities of pregnant women who contact with and exposure to the sources of lead; It consists of 2 categories namely 1) strong expose and 2) weak expose. Data were collected through a questionnaire containing a set of question.
b. Knowledge of pregnant women is knowledge concerning the danger and sources of the lead; it consists of 2 categories namely 1) not good and 2) good. Data were collected through a questionnaire containing a set of questions.

Processing of data includes editing, coding, entry, and cleaning of data conducted before analysis of data which consists of univariate analysis, bivariate analysis, and multivariate analysis.

a. Univariate analysis conducted to find the frequency of risky category of the independent variable
b. Bivariate analysis conducted to find a significant association between one independent variable and one dependent variable. By using confidence level of 95%, the value of confidence interval (CI) of Prevalence Odds Ratio (POR) stated as (CI 95%: POR = >1 - >1) meaning significant association between one independent variable and one dependent variable, stated as (CI 95%: POR = >1 - <1) meaning no significant association between one independent and one

dependent variable, as (CI 95%: POR = <1 - <1) meaning reverse association between one independent and one dependent variable.

3. RESULTS AND DISCUSSION

Table 1 shows that there was 72.9% of pregnant women who exposed to the source of lead strongly in Jakarta in 2018. Table 2 shows that there was 38.6% of pregnant women who have not good knowledge of the danger of lead in Jakarta in 2018.

Table 1

Frequency Distribution of Pregnant Women's Behaviour Concerning Fetal Risk of Lead Intoxication in Jakarta in 2018

Pregnant Women's Behaviour Exposed to the Source of Lead	Frequency	Percentage %
Strong	51	72.9%
Weak	19	27.1%
Total	70	100.0%

Table 2

Frequency Distribution of Pregnant Women's Knowledge Concerning Fetal Risk of Lead Intoxication in Jakarta in 2018

Pregnant Women's Knowledge on the Danger of Lead	Frequency	Percentage (%)
Not Good	27	38.6%
Good	43	61.4%
Total	70	100.0%

Table 3 shows that there was 50% of pregnant women having the lead in their blood causing Fetal Risk of Lead Intoxication in Jakarta in 2018.

Table 3

Frequency Distribution of Fetal Risk of Lead Intoxication in Jakarta in 2018

Fetal Risk of Lead Intoxication	Frequency	Percentage (%)
Yes	35	50%
No	35	50%
Total	70	100.0%

Table 4 shows that there was a significant association of Pregnant's Behaviour with Fetal Risk of Lead Intoxication in Jakarta in 2018.

Table 4
Association of Pregnant Women Behaviour with Fetal Risk of Lead Intoxication in Jakarta in 2018

Pregnant Women's Behaviour Exposed to the Source of Lead	Fetal Risk of Lead Intoxication				Total		P-Value	OR
	Yes		No					
	N	%	n	%	n	%		
Strong	34	66.7	17	33.3	51	100	0.000	36.0
Weak	1	5.3	18	94.7	19	100		4.425 – 292.851
Total	35	50	35	50	70	100		

Table 5 shows that there was no significant association between Pregnant Women's Knowledge with Fetal Risk of Lead Intoxication in Jakarta in 2018.

Tabel 5
Association of Pregnant Women Behaviour's Knowledge on the danger of Lead in Jakarta in 2018

Pregnant Women's Knowledge on the Danger of Lead	Fetal Risk of Lead Intoxication				Total		P-Value	OR
	Yes		No					
	N	%	n	%	n	%		
Not Good	16	59.3	11	40.7	27	100	0.326	1.837
Not good	19	44.2	24	55.8	43	100		0.693 – 4.873
Total	35	100	35	100	70	100		

Evaluation of research result

Quality of data consists of relevancy and validity of data, while the accuracy of data consists of

relevancy, validity, and reliability of data (7). Relevancy of data: In this present study, there is the relevancy of data because the collected, processed, and analyzed data have been implemented to achieve the objective of the research. The validity of data consists of external validity and internal validity. In this present study, there is no external validity because the sample of 70 pregnant women s not representative sample since it was not taken randomly from its population namely 139 pregnant women whose blood examined. It means that the result of this present study is only valid for 70 pregnant women in the sample, that cannot be generalized to 139 pregnant women whose blood examined. Internal validity opposite of Error which consists of random error or sampling error and systematic error (bias). Sampling error consists of alpha error and beta error which are useful to calculate sample size (8). In the analytic cross-sectional study, each independent variable has its own sample size based on alpha error and beta error. Bias consists of selection bias, information bias, and confounding bias (9). In this present study, selection bias cannot be avoided because the sample was not taken from a certain population. In this present study, information bias may happen because there may be mistakes in definition and measurement of the two independent variable namely pregnant women's behavior and pregnant women's knowledge. In this present study, confounding bias cannot be determined because the researcher did not conduct multivariate analysis. Reliability of data is the consistency of the result of measurement of independent and dependent variables by person and time. In this present study, the reliability of data cannot be determined because the collection of data conducted only one time.

Causal relationship

Since the researcher did not conduct multivariate analysis, discussion on a causal relationship cannot be continued. As a consequence, the present research cannot prove that pregnant women's behavior affects the fetal risk of lead intoxication.

Implication of study

Since there was no discussion on the causal relationship in this present study, discussion on the implication of study cannot be continued. However, the result of the present study is still useful, especially there is pregnant women's blood containing lead examined in a Clinical Laboratory in Jakarta. The next such a kind study should be conducted on a large scale covering all clinical laboratories in Jakarta by writing the following research proposal:

Association of Several Factors with Fetal Risk of Lead Intoxication in All Clinical laboratories in Jakarta: The objective of the study is to find factors affecting the fetal risk of lead poisoning. The type of research design is analytic coss sectional study (10). The dependent variable is the pregnant women's blood containing the lead. There will be several independent variables consisting of intervention variables (exposed to the battery, exposed to paint, exposed to cosmetics, exposed to soil, exposed to air pollution from motor vehicle emission, etc), and pregnant women's variables (age, education, family income, etc.). The population of the study is a number of pregnant women's blood containing the lead after examination in all clinical laboratories in Jakarta; the sample size is calculated based on alpha error (5%), beta error (10%), and another information based on the previous study. Data collected by taking blood from pregnant women for the lead examination, developing a questionnaire to collect independent variables namely intervention variables and pregnant women's variables. Analysis

of data consists of univariate, bivariate, and multivariate analysis (11)). After the presentation of the research result, discussion conducted by evaluation of research result, causal relationship, and implication of the study.

4. CONCLUSION

The result of the present research is only giving information limited to the sample of 70 pregnant women, and cannot prove that pregnant women's behavior affects the fetal risk of lead intoxication.

5. RECOMMENDATION:

To write a complete proposal titled Association of Several Factors with Fetal Risk of Lead Intoxication in All Clinical Laboratories in Jakarta.

REFERENCES:

[1] Hutabarat, Sahala 1985. Pegantar Oseanogrfi. Jakarta: UI Press.

[2] WHO, 2010. Exposure to Lead: A major public health concerning preventing diseases through a healthy environment. Public health and the environment. http://www.who.int/ipcs/features/lead.pdf 3 July 2018.

[3] Darmono, 2001. Lingkungan Hidup dan Pencemaran: Hubungan dengan senyawa Toksikologi Senyawa Logam. UI Press, Jakarta.

[4] BPLHD 2013. Laporan Status Lingkugan Hidup Daerah Khusus Ibu Kota Jakarta Tahun 2013. In Jakarta, B.D. (Ed.) Jakarta: BPLHD DKI Jakarta.

[5] Denny, A 2005. Deteksi pencemaran timah hitam (Pb) dalam darah masyarakat terpapar timbal (plumbum. Jurnal Kesehatan Lingkungan Juli 2005: 2(1) p. 67-8.

[6] Wibowo, IT 2019. Hubungan Pengetahuan dan Perilaku Ibu Hamil Terhadap Paparan Bahaya Logam Berat Timbal Pada Risiko Kelahiran janin di DKI Jakarta Tahun 2018, Skripsi yang disajikan di Program Studi Ilmu Kesehatan Masyarakat, Fakultas Ilmu-Ilmu Kesehatan, URINDO.

[7] Lapau, Buchari 2015. *Metode Penelitian Kesehatan. Metode Ilmiah Penulisan Skripsi, Tesis dan Disertasi.* Jakarta: Yayasan Pustaka Obor Indonesia

[8] Epidemiological and Methodology Unit of WHO 1986. *Sample Size Determination. A User's Manual*, First Edition, Geneve: WHO.

[9] Singhasivanon, Pratap 1992. Systematic Random Errors. A Lecture was Given in Asian Advanced Tropical Epidemiology Course in Bangkok, Thailand.

[10] Lapau, Buchari 2017. *Prinsip dan Metode Epidemiologi*. Jakarta: Kencana, Pranada Media Group.

[11] Mitra 2015. Manajemen dan Analisa Data. Edisi Pertama, Yogyakarta: Yayasan Penerbit Andi