Public Health Perspective Journal 3 (3) (2018) 158 - 166

Public Health Perspective Journal

http://journal.unnes.ac.id/sju/index.php/phpj

Analysis Of Risk Factors Causing The Incidence Of Prematurity In Mother With Severe Pre-Eclampsia (Case Study In Permata Bunda Hospital Purwodadi)

Rizki Sahara✉[1], Siti Baitul Mukarromah[2]

[1.] STIKES An Nur Purwodadi, Universitas Negeri Semarang, Indonesia

[2.] Universitas Negeri Semarang, Indonesia

Artikel Info

History ofArtikel:
History of Article :
Accepted 2 June 2018
Approved 13 October 2018
Published 23 December 2018

Keywords:
premature, severe pre-eclampsia, obstetric status, parity, lifestyle

Abstract

Premature labor can increase posibility of infant mortality. Disorders that occur in newborns baby from mothers who suffer from pre-eclampsia can be caused by several factors including maternal age, parity, gestational age, and birth weight of the baby and having a very high risk of complications. The purpose of this study is to analyze the influence of obstetric history, lifestyle and parity in causing the occurrence of premature labor and see the factors that have the most influence in causing the incident. This research is a quantitative study using a case control design with a retrospective approach. The population in this study is mothers with severe pre-eclampsia, sampling is done by using purposive sampling method with 122 respondents divided into two groups, 61 respondents in the case group and 61 respondents in the control group. The results of the study show that parity, lifestyle and obstetric history have a significant effect on the incidence of preterm birth in women with severe pre-eclampsia with p value <0.05. The obstetric history factor has a larger OR of 5,125 compared to other factors, parity with OR 5,102 and a lifestyle of 0.104, therefore it can be concluded that obstetric history has a biggest impact than other variables

✉Address:
Jl. Gajahmada No. 7 Purwodadi Grobogan
E-mail: rizkysahara88@gmail.com

p-ISSN 2528-5998
e-ISSN 2540-7945

INTRODUCTION

Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR) are indicators of the success of development in the health sector. Statistical data show that the infant mortality rate in 2016 in Central Java amounted to 9.99 / 1000 live births and decreased in 2017 at 8.93 / 1000 live births (Central Java Provincial Health Office, 2017). Grobogan Regency itself is still in the highest rank of infant mortality, in 2016 amounted to 17.02 / 1000 live births and fell to 13.83 / 1000 live births in 2017 (Health Office of Grobogan Regency, 2017). Although there has been a significant decline, the figure still exceeds the mortality rate of Central Java Province.

Maternal mortality rate in 2016 in Central Java was recorded at 109.65 / 100,000 live births and decreased in 2017 which amounted to 88.58 / 100,000 live births (Central Java Provincial Health Office, 2017). The maternal mortality rate of Grobogan Regency in 2016 was recorded at 127.21 / 100,000 live births and decreased in 2017 by 28 cases or by 83.51 / 100,000 live births where the cause of maternal death was hypertension in pregnancy 38.88%, bleeding 18.17%, infection 4.54 % and others 38.56% (Health Office of Grobogan Regency).

On the incidence of preeclampsia and eclampsia, it is also found the risk of preterm labor 2.67 times greater, artificial labor 4.39 times more, and a higher tendency for getting babies with low birth weight (Astuti, 2015). Preeclampsia, both independently and with other diseases, is the highest cause of maternal death and premature birth in the world.

The purpose of this study is to analyze the most influential risk factors among obstetric history, parity and lifestyle in causing premature birth in women with severe pre-eclampsia.

METHOD

The research design uses case and control design with a retrospective approach, which the independent variables are parity, lifestyle and obstetric history and the dependent variable, are premature mothers with pre-eclampsia which are collected through questionnaires and medical record assistance. The population in this study is maternity with severe pre-eclampsia. Sampling is done by using purposive sampling technique, Inclusion criteria in this study were severe pre-eclampsia mothers with preterm births and fulfilled several criteria, namely born in Permata Bunda Purwodadi Hospital in 2017-2018 with criteria for lower middle socioeconomic, 20-35 years old mothers, ANC history at least 4 times and pregnant women with normal weight gain during pregnancy The sample in this study uses a ratio of 1: 1 so that the number of sample groups of 61 respondents and the control group is 61 respondents so the total number of samples is 122 respondents.

RESULT AND DISCUSSION

Table 1. The Distribution of Respondent Characteristic's Frequency

Respondent Characteristic	premature (case)		Mature (control)	
	n	%	n	%
Age				
20 - 25 YO	16	26.2	17	27.9
26 - 35 YO	45	73.8	44	72.1
Total	61	100	61	100
Education				
SD	5	8.2	7	11.5
SMP	22	36.1	19	31.1
SMA	26	42.6	33	54.1
University	8	13.1	2	3.3
Total	61	100	61	100
Gestational Age				
28 – 36 weeks	61	100	0	0
37 – 42 weeks	0	0	61	100
Total	61	100	61	100
Parity				
Primiparous	37	60.7	20	32.8
Multiparous	24	39.3	41	67.2
Total	61	100	61	100
Life Style				
healthy	20	32.8	4	6.6
unhealthy	41	67.2	57	93.4
Total	61	100	61	100
Obstetric History				
Low risk	18	29.5	34	55.7
High risk	43	70.5	27	44.3
Total	61	100	61	100

The table above shows the characteristics of respondents, both in the case group and in the control group, the highest age group of respondents in the case group and control group are 73.8% and 72.1% respectively. Respondents' education in the table above shows that most of the respondents in the control and case group are at the high school level (SMA) of 42.6% and 54.1% respectively. The gestational age in the case and control group is adjusted to the number of samples in each group and it is obtained the above results.

The data in the table states that for parity, the majority of respondents in the control group are primiparous, mothers who give birth for the first time, it is 37 respondents or 60.7% while for the control group are more dominated by respondents with multiparous or more than one birth , it is 41 respondents or 62.7 %. Lifestyle variables states that most respondents in both case and control groups have unhealthy lifestyle habits; they are 67.2% and 93.4%, respectively. Unhealthy lifestyles on respondents can be seen from questionnaires for example by enjoying fast food, lack of exercise and exposure to

cigarette smoke which makes respondents become passive smokers, for obstetric history shows the case group respondents are mostly in the high risk category with 43 respondents or 70.5%, while for the control group most of the 34 respondents (55.7%) are in the low risk category.

Tabel 2. Bivariate analysis Risk factors for premature occurrence of mothers with severe pre-eclampsia at Permata Bunda Purwodadi Hospital

Mother's Factor	Labor				Total		*P value*
	Case		Control		N	%	
	N	%	N	%			
Parity**							
Primiparous	37	60.7	20	32.8	57	46.7	0.002*
Multiparous	24	39.3	41	67.2	65	53.3	
Total	61	100	61	100	122	100	
Life Style**							
Healthy	20	32.8	4	6.6	24	19.7	0.000*
Unhealthy	41	67.2	57	93.4	98	80.3	
Total	61	100	61	61	122	100	
Obs History **							
Low Risk	18	29.5	34	55.7	52	42.6	0.003*
High Risk	43	70.5	27	44.3	70	57.4	
Total	61	100	61	100	122	100	

The table above states that all variables have p value <0.05 so it can be concluded that all independent variables have a significant positive level to the dependent variable which states the existence of a relationship between the independent variable and the dependent variable. Lifestyle variables have the highest level of significance when compared to other variables that is equal to 0.000.

Tabel 3. Regression analysis of risk factors for prematurity in mothers with severe pre-eclampsia at Permata Bunda Purwodadi Hospital

Variabel	P value	OR	95.0% C.I for EXP(B)	
			Lower	Upper
Parity	0.000	5.102	2.070	12.579
Life Style	0.001	0.104	0.209	0.372
Obstetric History	0.001	5.125	2.037	12.892

The table above states that each variable has a significant influence. OR of the variable parity is 5.102, it indicates that the higher parity of a mother with severe pre-eclampsia will increase 5.1 times the incidence of premature birth. Obstetric history has the highest OR value of 5,125 which means that a mother with severe pre-eclampsia plus a bad obstetric history / high risk has a 5.12 times greater chance of being able to have premature birth. Whereas for bad lifestyle of pre-eclampsia

mothers contributing 0.104 higher causes premature birth when compared to other maternity mothers.

Effect of parity on the incidence of prematurity in mother with severe pre-eclampsia

Research data shows that, respondents with multiparous are 65 respondents or 53.3% and primiparous are 57 respondents (46.7%). The results shows that parity has a significant effect on premature occurrence in women with severe pre-eclampsia with p value = 0.002 where this value is <0.05 so parity has a significant effect on the incidence of premature birth in women with severe pre-eclampsia.

Primiparous and multiparous mothers are at risk of delivering low birth weight, in primiparous it is related to unprepared organ function in maintaining pregnancy and accepting fetal presence, mother's skills to carry out self-care and her baby and psychological factors that are still unstable (Rochyati, 2003), while mothers who have given birth four times or more, because parity is too high, it will cause disruption of the uterus, especially in terms of blood vessel function. Repeated pregnancy will cause damage to the uterine artery wall; it will affect nutrition to the fetus in subsequent pregnancies so that it can cause growth disturbances which will later the mother will give birth to babies with LBW (Wiknjosastro, 2002).

The results of the analysis (Karima et al, 2015) states that mothers with primigravida have a 1,318 times chance of experiencing pre-eclampsia and pre-eclampsia could occur in both primigravidas and multigravidas. Goffinet (2005) in his study entitled "*Primary Predictor of Preterm Labor*" stated that parity has a relationship to the occurrence of premature and it is not included in the possibility of intervention. It is different from the results of the study of Jakobsson, et al,in 2008 that states primiparous has a risk of 1.47 times greater to experience of the occurrence of premature birth when compared to multiparity.

Temu et al (2016) states that parity has a significant effect on the incidence of premature birth where primiparous has the highest risk of 2.82 times greater to experience premature birth compare to grandemultiparous and mothers who have given birth 2-4 times with OR - respectively 1.24 and 1.0. There is little difference with (Azizah, 2017) that there is no significant relationship between parity and neonatal mortality.

The influence of lifestyle on the incidence of prematurity in mothers with severe pre-eclampsia

The lifestyle of respondents in this study mostly is in an unhealthy category, they are 41 respondents (67.2%) in case group and 57 respondents (93.4%) in the control group with p value 0.000 where the value is smaller than α 0.05 it proves that there is an influence between lifestyle and the incidence of pre-eclampsia. The lifestyle is seen from several aspects; occupation, daily activities, exercise habits, consumption of drugs, herbs, food that are consumed, smoking habits, interaction with others, and rest. Unhealthy lifestyles have a risk of 0.104 times affecting the incidence of pre-eclampsia. This makes the lifestyle at the lowest level when compare to other variables in this study. The results show that some of the respondents are housewives with independent activities. Some of them do not do exercise regularly and some are often consume fast food such as instant noodles. Most of the respondents live with their husbands and other families where there are family members who are active smokers making the wives expose to cigarette smoke, and mothers have proper resting patterns in which they are able to sleep at least 6 hours per day. Pregnant mothers who are exposed to cigarette smoke can have a bad effect on pregnancy and also the fetus. Chemical compounds in cigarettes can get into the body of a pregnant mother and poison the fetus. One of the most common sources of exposure to cigarette smoke for pregnant mother is the presence of family members who smoke at home. The results of the analysis of the study (Noriani, et al, 2015) shows that mothers who are passive smokers have risk of 3.6 times to experience premature birth. Exposure to cigarette smoke can increase the risk of complications of pregnancy and premature

labor; this is caused by nicotine and carbon dioxide contained in cigarette smoke.

The increasing of mothers who work during pregnancy also triggers stress in doing their work. Physical stress includes shift work, long working time, and burden associated with the incidence of premature birth (Mutambudzi, 2011). Rao (2003) states that physical activity has no significant effect on the incidence of premature but has a positive relationship with the incidence of low birth weight babies. This difference results can be due to differences in controlling confounding variables in each study. Pregnant mothers who have a habit of smoking and consuming alcohol also cause premature babies. These factors can cause disruption / decrease of placental function and force the baby to be delivered prematurely, when the baby is born before sufficient gestation, the baby's organs are immature and premature babies need special care to enable the them to adapt to the outside environment (Cunningham, 2010). Mountquin (2003) proved that stress associated with the incidence of prematurity is the presence of death, family illness, violence in family, or financial problems.

Effect of obstetric history on the incidence of prematurity in mothers with severe pre-eclampsia.

The results shows that in the case group there are 44 respondents (70.5%) who have a high risk associated with obstetric history, while for the control group there are more respondnets who have low risk associated with obstetric history with 34 respondents (55.7%). p value in obstetric history is 0.003 where this value is less than 0.05 so it has a significant influence on the incidence of premature in women with pre-eclampsia. The OR value of obstetric history is 5.125 which indicates that mothers with a bad obstetric history / high risk have a 5 times greater possibility of experiencing premature incidence later on. Pre-eclampsia that appears at <37 weeks of gestation allows it to become more severe so that it can cause effects in fetal development which is one of the causes of premature birth (Xiong, 2002).

Hollingworth (2012), states that obstetric history is closely related to relative subfertility, a history of 16-24 weeks miscarriage, and a history of premature labor. The results of this study are in accordance with the results of (Saraswati, 2016) that there is a significant relationship between the history of pre-eclampsia and the incidence of pre-eclampsia in pregnant women which is 20.5 times greater compared to mothers who have never experienced pre-eclampsia. Alijahan, et al (2013) state the same thing, the existence of a history of preterm labor has an effect of 12.7 times greater causing premature birth later on, as well as a history of pre-eclampsia which contributed 3.6 times the incidence of prematurous parturition in women with pre - eclampsia.

Women with a history of abortion have a higher risk of premature labor. Abortion can cause bleeding, shock and neurological disorders in the future. Bleeding can lead to reproductive infection and thinning of the uterine wall due to curettage which is done in an unsterile way. Research (Malka, 2013) conducted on 140 respondents in Bone regency mention similar results that the history of abortion is the most influential risk factor with an OR value of 5.14 times for the incidence of premature birth.

Effect of parity, lifestyle and obstetric history on the incidence of prematurity in women with severe pre-eclampsia.

Premature birth is a major cause of neonatal mortality, morbidity and long-term disability. Neonatal mortality rates contribute 30.7% of all under-five deaths with the biggest proportion is due to cases of prematurity (Brits, 2015). Hypertension in pregnancy especially pre-eclampsia is a major cause of maternal and neonatal deaths in the world. The pathophysiology of pre-eclampsia which its cause has not been known yet has caused many

failures in preventing premature parturition (Xiong, 2002).

Wiknjosastro (2002) states that parity 1 and ≥ 4 have higher maternal mortality rates. The higher parity, the higher maternal mortality will be. In low parity, most mothers have not been ready yet physically or mentally in undergoing pregnancy, the risk of maternal death can be prevented by doing better obstetric care, while in high parity, mothers have given birth for several times which causes declining of the function of reproductive organs, the risk can be reduced or prevented with family planning. The results of this study indicate that parity has an effect of 5,102 times greater in causing the incidence of premature birth in women with severe pre-eclampsia. The results of this study are in accordance with the research (Listiani, 2012) which states that based on the calculation of OR 2.2, mothers who have risky parity (1 and> 3) risk 2.2 times giving birth to premature babies when compare to mothers who have no risky parity . Most mothers give birth with risky parity in parity 1 and ≥ 4. In mothers with parity 1, most mothers have not been ready yet physically and mentally in undergoing pregnancy, while in parity ≥ 4 mothers have given birth several times which causes declining of the function of reproductive organs.

Lifestyle with a value of OR 0.104 indicates that there is an influence on premature occurrence in women with pre-eclampsia even though the value is low compare to other variables. Smoking and alcohol consumption during pregnancy are said to be the cause of low birth weight babies, but research in South Africa states that only smoking causes premature birth (Steyn, 2006), but in research (Brits, 2015) states that only 5% of mothers who smoke during pregnancy give birth prematurely. The theory states that having and being able to carry out work is an indicator of high socioeconomic status, which can have an effect on premature birth (Offiah, et al, 2012). Behavior stressors such as smoking, alcohol and drug use, improper consumption, sexual activity and physical activity are important risk factors in their influence on premature birth (Behrman & Butler, 2007). Complications during pregnancy can increase the risk of a baby's birth. Research (Jammeh, et al, 2011) states that obstetric complications can increase the significance of the factors causing the occurrence of low birth weight babies and also premature birth. Mothers with antenatal hemorrhage and hypertension during pregnancy can cause these two things to happen; giving birth to a LBW baby and being premature. Most mothers with a history of premature birth have chances to have premature birth again.

The explanation above is in accordance with the results of the study (Temu, 2016) which concluded that there is an increase in blood pressure in pregnancy with the incidence of premature birth. Women who experience raising blood pressure / pre-eclampsia in pregnancy have a greater risk of 7 times compared to normal women. Seeing the incidence of pre-eclampsia and premature births that are in high level in several regions in Indonesia and even the world, it is expected to make the community become more attentive to the health of each family member. Reducing mothers and babies mortality is one of the goals of the MDGs *(Millennium Development Goals*) that have not been achieved, for that reason; this program is continued in the SDGs (*Sustanaible Development Goals*) with broader goals and scope. With the targets and indicators set by the government, it is expected that the incidence of pre-eclampsia and premature birth can be a priority target to help reduce mothers and babies mortality in the world and especially in Indonesia.

CONCLUSION

Parity, lifestyle and obstetric history have a significant effect on the incidence of prematurity in women with severe pre-eclampsia and obstetric history variables became the biggest factor in the effect on the incidence of premature birth in women with severe pre-eclampsia

SUGGESTION

The results of this study can be used to improve service and quality for the community, especially for early detection of high-risk pregnant women especially severe pre-eclampsia, providing a place for people to be able to get adequate services.

ACKNOWLEDGEMENT

Thank you to the academic and advisors who have provided knowledge and opportunities for the author to be able to complete this research.

REFERENCES

Alijahan, Rahele., Hazrati, S., Mirzarahimi, M., Pourfarzi, F., Hadi, PA. 2014. Prevalence and risk factors associated with preterm birth in Ardabil Iran. *Iran J Reprod Med Vol 12. No. 1. Pp:47-56*

Ariana, D. N., -, S., & Kusumawati, E. 2013. Faktor Risiko Kejadian Persalinan Prematur (Studi Di Bidan Praktek Mandiri Wilayah Kerja Puskesmas Geyer Dan Puskesmas Toroh Tahun 2011). *Jurnal Kebidanan. Retrieved from* http://jurnal.unimus.ac.id/index.php/jur_bid/article/view/555

Astuti, S. R. 2015. Faktor – faktor yang berhubungan dengan kejadian preeklampsia kehamilan di Wilayah Kerja Puskesmas Pamulang Kota Tangerang Selatan Tahun 2014-2015. *Skripsi*. UIN Syarif Hidayatullah Jakarta.

Azizah, I., & Handayani, O. K. 2017. Kematian Neonatal Di Kabupaten Grobogan. *HIGEIA (Journal of Public Health Research and Development)*, *1*(4), 72-85.

Behrman, RE., & Butler, SA. 2007 Preterm birth: Causes, consequences, and prevention. *Washington, DC. National Academic Press, ISBN.*

Brits, H., Adriaanse, M., Rall, D-M., Biljon, M Van., Walt, Van Der., Wasserman, E., Joubert, G. 2015. Cause of Prematurity in the Bloemfontein Academic Complex. *South-Africa Family Practice 2015; 57(3):223-226.* http://doi.org/10.1080/20786190.2014.976960

Chotimah, C., & Mukarromah, S. B. 2017. Predisposisi Perilaku Ibu Hamil Anemia Yang Mempengaruhi Kepatuhan Antenatal Care dan Mengkonsumsi Tablet Fe. *Public Health Perspective Journal*, *2*(2).

Cunningham, F, et all. 2010. *E-book Williams Obstetrik 23rd edition*.

Gamelia, E. Kurniawan, A. 2017. Determinant of Teenage Pregnancies. *Jurnal KEMAS Unnes, 13 (2) (2017) 270-276.* https://dx.doi.org/10.15294/kemas.v13i2.7380

Goffinet, François. 2005. Primary prediction of preterm labour. *International Journal of Obstetrics and Ginaecology March 2005, Vol. 112, Supplement 1, pp. 38 - 47.*

Hollingworth, T. 2012. *Diagnosa Banding dalam Obsetri & Ginekologi A-Z. (M. dr Ganda, Alfred dr., Surya, Ed.)*. Jakarta: Penerbit Buku Kedokteran EGC.

Karima, NM., Machmud, R., Yuarawati. 2015. Hubungan faktor resiko dengan kejadian Pre-Eklampsia Berat di RSUP Dr. M. Jamil Padang. *Jurnal Kesehatan Andalas. 2015; 4(2).* http://jurnal.fk.unand.ac.id

Listiani, Dwi. 2012. Hubungan umur dan paritas ibu dengan kejadian BBLR di RSUD Banjarbaru Tahun 2011. *Politeknik Kesehatan Banjarbaru Banjarmasin.*

Malka, St., Amirudin, ridwan., S. S. 2013. Analisis Faktor Risiko Kejadian Kelahiran Prematur Di Blud Rsu Tenriawaru Kelas B Kabupaten Bone Tahun 2013. *Fakultas Kesehatan Masyarakat Universitas Hasanuddin.*

Moutquin, Jean-Marie. 2003. Socio-Economic and Psychosocial Factors in the Management and Prevention of Pretem Labour. *An International Journal of*

Obstetric and Gynecology Vol. 110. doi:10.1016/S1470-0328(03)00031-4

Noriani, N.K., et al. 2015. Paparan Asap Rokok dalam Rumah Terhadap Risiko Peningkatan Kelahiran Bayi Prematur di Kota Denpasar. *Public Health and Preventive Medicine Archive Vol 3 No 1.*

Notoatmodjo, S. 2012. *Metodologi Penelitian Kesehatan.* Jakarta. Rineka Cipta.

Nursalam. 2013. *Konsep dan Penerapan Metodologi Penelitian Ilmu Keperawatan Pedoman Skripsi, Tesis, dan Instrumen Penelitian Keperawatan.* Jakarta: Salemba Medika.

Offiah, I., O 'donoghue, K., & Kenny, L. (n.d.). 2012. Clinical Risk Factors for Preterm

Rochjati,P. 2003. Skrining Antenatal Pada Ibu Hamil, Pengendalian Faktor Resiko, Deteksi Dini Ibu Hamil Resiko Tinggi. *Airlangga University Press. Surabaya.*

Saraswati, Nuning. 2016. Faktor resiko yang berhubungan dengan kejadian Pre-Eklampsia pada ibu hamil (studi kasus di RSUD Kabupaten Brebes Tahun 2014). *Unnes Journal of Public Health 5(2) (2016). http://journal.unnes.ac.id/sju/index.php/ujph*

Steyn K, de Wet T, Saloojee Y, et al. 2006. The influence of maternal cigarette smoking, snuff use and passive *smoking* on pregnancy outcomes: the birth to ten study. *Paedia Perinatal Epidemiologi. 2006;20(2):90–9. http://dx.doi.org/10.1111/ppe.2006.20.issue-2*

Temu, Theresia B., et al. 2016. Maternal and Obstetric Risk Factors Associated With Preterm Delivery at a Referal Hospital in Northem-Eastern Tanzania. *Asian Pacific Journal of Reproduction 2016; 5(5): 365–370. http://dx.doi.org/10.1016/j.apjr.2016.07.009*

Wiknjosastro,H. 2002. *Ilmu Kebidanan. Jakarta.* Yayasan Bina Pustaka Sarwono Prawirohardjo.

Xiong, Xu., et al. 2002. Impact of Preeclampsia and Gestational Hypertension on Birth Weight by Gestational Age. *American Journal of Epidemiology Vol. 155, No. 3*