Analysis of Antenatal Care on Referred Patient with Eclampsia at Dr. Soetomo General Hospital Surabaya in 2015-2019

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Abstract

Background: This study aims to show ANC characteristic data and its analysis can be used as a tool to ensure a better ANC quality, especially in relation to the incidence of eclampsia.
Method: Retrospective descriptive study using medical records of referred pregnant women at >20 weeks of gestation and postpartum women >12 weeks diagnosed with eclampsia at Dr. Soetomo General Hospital, Surabaya in 2015-2019.
Result: p-value of 0.077 was obtained for the relationship between the number of ANC visits and the incidence of eclampsia with OR (95% CI) 1.673 (943-2.970), Then, from T1 to T10, the quality of ANC with the incidence of eclampsia was obtained **T1**: p-value 0,660 OR (95% CI) 1.205 (524-2.772) **T2**: p-value 0,051 OR (95% CI) 2.221 (997-4.947),**T3**: p-value 0,724 OR OR (95% CI) 914 (554-1.507),**T4**: p-value 0,731 OR (95% CI) 1.138 (545-2.376), **T5**: p-value 0,191 OR (95% CI) 1.714 (759-3.874), **T6**: p-value 0,459 OR (95% CI) 1.234 (707-2.154),**T7**: p-value 0,454 OR (95% CI) 1.933 (472-7.912),**T8**: p-value 0,627 OR (95% CI) 1.138 (676-1.914), **T9**: p-value 0,784 OR (95% CI) 1.138 (650-1.768),**T10**: p-value 0,525 OR (95% CI) 916 (542-1.551).
Conclusion: No significant relationship between the number and quality of ANC and the incidence of eclampsia, both classic and crucial types.

Keywords: Antenatal care quality; incidence of eclampsia

1. Introduction

Antenatal care (ANC) is a routine health control of healthy pregnant women without symptoms, utilized to diagnose disease or complications of asymptomatic obstetric conditions and provide information about lifestyle, pregnancy, and childbirth[1]. Prior studies have revealed that ANC visits could reduce maternal and perinatal mortality and achieve good infant outcomes[2]. ANC guideline from Indonesia Ministry of Health mandates a minimum of 4 visits for pregnant women[3]. Standard of care consists of a minimum of 10 components, commonly known as 10T, which are[4]:

1. Measurement of body weight and height (T1)
2. Measurement of blood pressure (T2)
3. Assessment of nutritional status (by measuring upper arm circumference) (T3)
4. Examination of fundal height (T4)
5. Determining fetal presentation and fetal heart rate (FHR) (T5)
6. Screening for tetanus immunization status and administering Tetanus Toxoid (TT) if needed. (T6)
7. Administration of iron tablets of at least 90 tablets during pregnancy (T7)
8. Laboratory tests (routine and specific) (T8)
9. Case management (T9)
10. Counselling, including birth planning and complication prevention, as well as post-delivery family planning (T10)

Factors that contribute to maternal mortality can be classified as direct causes and indirect causes. Direct causes are those related to complications occurring during pregnancy, childbirth, and postpartum, such as; hemorrhage, preeclampsia/eclampsia, infection, obstructed labor, and abortion. Indirect causes were factors that may aggravate the condition of pregnant women, such as being too young, advanced age, giving birth too often, and the time between one delivery to another that is too close. According to SDKI 2002, indirect causes account for up to 22.5% of all causes[4].

During 2010 – 2013, preeclampsia became one of the three major causes of maternal mortality in Indonesia, with the other two being hemorrhage and infection. Hemorrhage and infection tend to decrease in the past years, while hypertension in pregnancy has shown an increase. More than 25% of maternal deaths in Indonesia that occurred in 2013 were caused by hypertension in pregnancy[5].

Preeclampsia was the second leading cause of death for pregnant women in East Java in 2017, recording up to 28.92% or as many as 153 people[6]. Meanwhile, in Surabaya, preeclampsia was one of the highest causes of maternal death in 2018[7].

Lack of knowledge and application of prevention of preeclampsia through ANC and the high rate of mortality and morbidity of preeclampsia in the world and especially in Indonesia are benchmarks for the importance of preventing preeclampsia. On this basis, researchers aimed to study the characteristics of referral patients at Dr. Soetomo General Hospital diagnosed with eclampsia as a complication of preeclampsia in 2015-2019.

2. Methods

This was a retrospective descriptive study, with analytic observational design and a cross-sectional approach. Patients enrolled in this study were eclamptic pregnant women at >20 weeks' gestation and women at >12 weeks' post-partum referred to Dr. Soetomo General Hospital during 2015 - 2019. The sampling method used was total sampling, by obtaining secondary data from daily ER shift reports whose Maternal and Child Health book available. Data analysis was done by univariate and bivariate analysis using the Chi-Square test.

3. Result

Of 311 patients diagnosed with eclampsia, only 272 met the inclusion criterion (whose Maternal and Child Health book is available).

Table 1. Descriptive data of ANC visits of referred pregnant women diagnosed with eclampsia in Dr. Soetomo General Hospital during 2015 – 2019

Variable	n	%
Maternal Age		
- < 20 years old	61	22,4
- 20-34 years old	169	62,1
- >34 years old	42	15,4
Origin of reference		
- Surabaya	108	39,7
- Outside Surabaya	164	60,3
Eclampsia type		
- Classic	213	21,7
- Crucial	59	78,3
Parity		
- Nulliparous	157	57,7
- P1	70	25,7
- P2	26	9,6
- P3	11	4,0
- P4	5	1,8
- P5	3	1,1
Comorbidity		
- No	150	55,1
- Yes	122	44,9
Administration of MgSO4		
- <24 hours	259	95,2
- >24 hours	13	4,8
ANC		
- > 4 times	208	76,5
- < 4 times	59	21,7
- Never	5	1,8
Quality of ANC (T1-T10)		
- Complete	29	10,7
- Incomplete	243	88,7
Quality of ANC obtained by patient		
- T1	246	90,4
- T2	245	90,0
- T3	132	48,2
- T4	237	87,1
- T5	247	90,8
- T6	80	29,4
- T7	264	97,1
- T8	176	64,2
- T9	142	52,2
- T10	92	33,8
Death	**21**	**7,7**

Of 311 patients diagnosed with eclampsia, only 272 met the inclusion criterion. Our study found that most samples were in the age range of 20 – 35 years old with 62.1%, followed by maternal age of < 20 years old in second place and pregnant women aged > 35 years old in third place. This indicates that there are still many pregnant women with high-risk maternal age, almost comparable to the age of low-risk pregnant women.

Table 2. Analysis of ANC visits of referred pregnant women diagnosed with eclampsia in Dr. Soetomo General Hospital during 2015 – 2019

	Eclampsia		OR (95% Cl)	p
	Classic	Crucial		
Age				0.409
< 20 years old	44 (16,2%)	17 (6,3%)		
20-34 years old	135 (49,6%)	34 (12,5%)		
> 34 years old	34 (12,5%)	8 (2,9%)		
Referral Origin			1.172 (701-1.959)	0,545
Surabaya	2S (9,2%)	83 (30,5%)		
Outside Surabaya	34 (12,5%)	130 (47,8%)		
Parity				
Nulliparous	48 (17,6%)	22 (8,1%)	828 (463-1.479)	0,523
Multiparous	93 (34,2%)	64 (23,5%)	1.950 (1.l55-3.293)	0,013
Comorbidity Factors	28 (10,3%)	94 (34,6%)	710 (427-1.180)	0.186
Administration of MgSO4 < 24hours	167 (61,4%)	92 (33,8%)	330 (072-1.521)	0.230
Total ANC			1.673 (943-2.970)	0.077
> 4	142 (52,2%)	66 (24,3%)		
< 4	36 (13,2%)	28 (10,3%)		
Death			0.666 (0.237-1.869)	0.760
Yes	55 (20,2%)	4 (1,5%)		
No	196 (92,3%)	17 (6,3%)		

	Death		OR (9S% Cl)	P
	No	Yes		
Seizure Type			943 (367-2.422)	0,902
Classic	164 (60,3%)	14 (12,1%)		
Crucial	87 (74,6%)	7 (2,6%)		

	Eclampsia		OR (95% Cl)	p
	Classic	Crucial		
Quality of ANC	162 (59,6%)	84 (30,9%)	1.205 (524-2.772)	0.660
Tl: Yes				
No	16 (5,9%)	10 (3,7%)		
T2: Yes	165 (20,2%)	4 (1,5%)	2.221 (997-4.947)	0.051
No	13 (4,8%)	14 (5,1%)		
T3: Yes	85 (31,3%)	47 (17,3%)	914 (554-1.507)	0.724
No	93 (34,2%)	47 (17,3%)		
T4: Yes	156 (57,4%)	81 (29,8%)	1.138 (545-2.376)	0.731
No	22 (8,1%)	13 (4,8%)		
T5: Yes	164 (60,3%)	82 (30,1%)	1.714 (759-3.874)	0.191
No	14 (2,9%)	12 (6,6%)		
T6: Yes	55 (20,2%)	25 (9,2%)	1.234 (707-2.154)	0.459
No	123 (45,2%)	69 (25,4%)		
T7: Yes	174 (64,0%)	90 (33,1%)	1.933 (472-7.912)	0.454
No	4 (1,5%)	4 (1,5%)		
T8: Yes	117 (43,0%)	59 (21,7%)	1.138 (676-1.914)	0.627
No	61 (22,4%)	35 (12,9%)		
T9: Yes	94 (34,6%)	48 (17,6%)	1.138 (650-1.768)	0.784
No	84 (30,9%)	46 (16,9%)		
TlO: Yes	59 (21,7%)	33 (12,1%)	916 (542-1.551)	0.525
No	119 (43,8%)	61 (22,4%)		

From our data, referral patients diagnosed with eclampsia were dominated by the crucial type of eclampsia with a substantial ratio of 78.3%:21.3%, compared to the classic type of eclampsia. Types of eclampsia can be used to describe patients' prognoses and treatment plans.

MgSO4 was mostly administered within < 24 hours (95.2%). This illustrates that health care workers have administered appropriate drugs to eclampsia patients according to guidelines. From our study, most of the patients underwent more than 4 ANC visits, but unfortunately lacked acceptable ANC visits quality according to WHO criteria. The majority of the patients did not receive a complete 10Tˢ, with 6th T (screening for tetanus immunization status and administering Tetanus Toxoid (TT) if needed) being the service they do not acquire the most, followed by 10th T (counseling, including birth planning and complication prevention, as well as post-delivery family planning), and 3rd T (assessment of nutritional status (by measuring upper arm circumference)). Mortality is 7.7%.

4. Discussion

Referred eclamptic patients in Dr. Soetomo General Hospital were dominated by referrals from health facilities outside Surabaya. This may be associated with the quality of ANC, as well as demographic factors. According to a study conducted by Ukah et al. [8], pregnant women living in rural areas were two times more likely to develop preeclampsia than pregnant women living in urban areas.

Our study revealed the majority of samples mainly were nulliparous. This is in accordance with a study by Ukah et al.[8] that demonstrated that nulliparous women were 3.6 times more likely to develop preeclampsia compared to multiparous women.

From our data, most women presented with no comorbidities and risks, with 55.1%, much higher than those with comorbidities and risks.

Our analysis revealed that there was no significant association between maternal age and parity with eclampsia. A prior study by Mahran et al.[9] has also presented a similar result, for age, the p-value (0.185) was obtained. Kartika et al[10] study showed that a p-value (0.836) for age and a p-value (0.854) for parity. There was

no significant association found between the place of origin before referral and eclampsia (p = 0.545). However, a study by Machano dan Joho[11] presented otherwise with a p-value of 0.002. This may be due to differences in culture and geographical locations.

Our analysis showed no significant association found between the amount of ANC visits as per WHO recommendation and preeclampsia. Our result matched with a prior study conducted by Mahran et al.[2] with a p-value of 0.534.

No significant association was found between MgSO4 administration and death, with a p-value of 0.06. A study by Sriwandoko et al.[13] also revealed the same result, showing that out of 45 pregnant women administered MgSO4, 11 pregnant women died. This may be explained by the fact that MgSO4 administration alone does not directly affect maternal mortality, rather other factors such as referral system and the management of already occurring eclampsia.

In general, this study did not find a significant association between the incidence of eclampsia with maternal age, parity, number of ANC visits. However, authors hope that there will be further studies focusing on the analysis of association between ANC quality from T1 to T10 and the incidence of eclampsia. Theoretically speaking, there may be several factors that can influence this association. This can be related to risk factors in the mother, both biological and non-biological factors, which are usually owned by the mother before pregnancy and during pregnancy which will aggravate the emergence of other disorders. These factors can be classified into two factors, namely medical factors and non-medical factors. Medical factors include age, parity, gravidity, gestational distance, history of pregnancy and childbirth, and non-medical factors are antenatal monitoring[14]. In addition, the factors of socio-economic standards in the area where the research is carried out can affect the incidence of eclampsia.

5. Conclusion

The quality of ANC visits of referred patients diagnosed with eclampsia in Dr. Soetomo General Hospital did not meet the standards of quality according to the Ministry of Health of the Republic of Indonesia in 2010. From our analysis, there was a non-significant relationship between the quality of ANC and the incidence of two types of eclampsia, both classic and crucial.

Ethical Approval
The research was approved by the Human Research Ethics Committee, Dr. Soetomo General Teaching Hospital, with approval number 0873/104/4/VII/2021.

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