



eISSN : 2579-8324 pISSN : 2579-8323

RESEARCH ARTICLE

Factors Associated with Maternal Mortality in The Central General Hospital Dr. M. Djamil Padang 2020-2021

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Abstract

Objective: To Know factors of cause maternal mortality at Dr. M. Djamil Central General Hospital in Padang during the period January 1st, 2020 - December 31st, 2021. **Method:** This study used a retrospective analytic design with a cross sectional study design and used logistic regression to know the role of factors maternal mortality. Determination of the sample using total sampling. Conducted review using a reference register book, medical records, for 2 years from January 1st, 2020 – December 31st, 2021 at the Department of Obstetrics and Gynecology, Dr. M. Djamil. **Results:** Selection of variables with chi-square bivariate analysis ($p < 0.25$) between maternal mortality with; obstetric emergency ($p=0.039$), comorbidities ($p=0.587$), maternal age ($p=0.064$), maternal education ($p=0.920$), parity ($p=0.735$), intensive care ($p=0.000$), and operative procedure. ($p=0.000$). Multivariate analysis ($p<0.05$) to determine the most dominant factor; obstetric emergency ($p=0.143$), maternal age ($p=0.269$), intensive care ($p=0.753$) and operative procedures ($p=0.000$). Then test by removed the intensive care, and maternal age factors, the results of the operative procedure were obtained before ($p=0.000$, $OR=161.158$, $95\% CI=12,343-2104,177$) and after ($p=0.000$, $OR=133,368$). **Conclusion:** obstetrics emergency, maternal age, intensive care, and operative procedure are factors that cause maternal mortality at Dr. M. Djamil Central General Hospital in Padang. Operative procedure is the most dominant factor causing 161 times greater maternal mortality.

Keywords: operative procedures; maternal mortality; obstetric emergencies; intensive care; maternal age

INTRODUCTION

According to the World Health Organization (WHO) maternal or maternal death (MM) is death during pregnancy or within 42 days after termination of pregnancy, due to all causes related to or aggravated by pregnancy or its management, but not due to accident / injury.^{1,2}

Based on the 2015 Inter-Census Population Survey (SUPAS), maternal mortality commonly known as the Maternal Mortality Rate (MMR) is 305/100,000 live births/KH.¹ This condition is still far from the target of achieving the 2030 Sustainable Development Goals (SDGs), which is reaching the IMR to 12/100 1000 KH and reach AKI to 70/100,000 KH.²

Based on data from the Central Statistics Agency of West Sumatra Province in the period 2018-2021, maternal / maternal mortality continues to increase. In 2018 there were 113 cases, in 2019 there was an increase to 116 cases, in 2020 there was also an increase of 125 cases, and



eISSN : 2579-8324 pISSN : 2579-8323

in 2021 maternal deaths experienced a spike to 196/100,000 KH. ^{3,4}

In the city of Padang, the maternal mortality rate (MMR) fluctuated in the period 2016 – 2021. In 2016 there were 20 cases, in 2017 it fell by 16 cases, in 2018 it became 17 cases, in 2019 it again decreased to 16 cases, in 2020 experienced a spike to 21 cases and in 2021 a significant increase to 30/100,000 KH. ⁴⁻⁶

Central General Hospital (RSUP) Dr. M. Djamil Padang is one of the national referral center hospitals (RS) that receive referrals not only from West Sumatra Province, so Dr. M. Djamil Padang became the last spearhead in reducing maternal mortality. Based on recap data compiled by the Department of Obstetrics and Gynecology, Dr. M. Djamil Padang in the 2020-2021 period, each MMR was 25 cases in 2020 and drastically increased to 47 cases in 2021.

METHOD

This study used a retrospective analytic design with a cross sectional study design and used multivariate analysis with multiple logistic regression to study the role of independent variables in influencing maternal mortality. Determination of the sample using total sampling. A study was carried out using a reference register book, medical records/records, for 2 years from January 1, 2020 – December 31, 2021 at the Department of Obstetrics and Gynecology, Dr. M. Djamil.

RESULTS

In a period of 2 years starting from January 1, 2020 to December 31, 2021 at the Midwifery Section of Dr. RSUP. M. Djamil Padang, there were 72 cases of death, 23 (31.94%) cases of maternal death, and 49 (68.56%) cases of postpartum maternal death. Of the 38 mothers who had obstetric emergencies, 26 (68.42 %) cases had PEB / impending eclampsia / eclampsia, 8 (21.05%) cases had sepsis, 2 (5.26%) cases were suspected of amniotic embolism, and 2 (5.26%) cases with postpartum hemorrhage.

In this study, maternal comorbidities could be found in 2 or more comorbidities. Distribution of comorbidities in the mother, namely; 32 cases with confirmed positive COVID-19, 20 cases with pneumonia, 16 cases each with a previous history of CS and impaired blood function (DIC, thrombocytopenia, hypercoagulopathy), 15 cases each with anemia and renal impairment (AKI, CKD, metabolic acidosis), 14 cases with hypoalbuminemia, 13 cases each with impaired liver function and pulmonary disorders (ALO, pulmonary TB, pleural effusion, pneumothorax), 11 cases with HELLP syndrome, and spread of other comorbidities.

Based on maternal age, maternal mortality was at the youngest age of 18 years, and the oldest death at the age of 46 years, with an average death age of 31.76 years.

Based on the mother's education, each consisted of: 4 (5.55%) cases with elementary school education, 9 (12.5%) cases with junior high school education, 43 (59.72%) cases with high



eISSN : 2579-8324 pISSN : 2579-8323

school education, 2 (2.78%) cases of D3 education, and 14 (19.44%) cases of undergraduate education.

parity distribution; there are 8 and 7 parity 1 (1.39%) cases respectively, 6 and 5 parity 3 (4.17%) cases, 4 parity 9 (12.50%) cases, 3 parity 18 (25, 00 %) cases, 2 parity 22 (30.56%) cases, and 1 parity 15 (20.83%) cases.

Of the total 72 cases, 52 cases received intensive care, namely; 19 (36.54%) cases of intensive care in the green zone, and 33 (63.46%) in the red zone. There are 43 cases, namely; 1 (2.32%) cases underwent curettage, 39 (90.69%) cases underwent cesarean section, and 3 (6.98%) cases underwent hysterectomy.

Selection of causative factors using chi-square ($p < 0.25$) bivariate analysis test between maternal mortality and; obstetric emergencies ($p = 0.039$), comorbidities ($p = 0.587$), maternal age ($p = 0.064$), maternal education ($p = 0.920$), parity ($p = 0.735$), intensive care ($p = 0.000$), and operative procedures ($p = 0.000$). Thus, obstetric emergencies, maternal age, intensive care and surgery are the causes of maternal death.

The results of multivariate analysis ($p < 0.05$) multiple logistic regression testing to determine the most dominant factor, namely; obstetrics emergency ($p; 0,143 > 0,05$), maternal age ($p; 0,269 > 0,05$), intensive care ($p; 0,753 > 0,05$) and surgery ($p; 0,000 < 0,05$). Re-testing by removing the factors of intensive care, and maternal age, the results of the operation were obtained before ($p = 0.000$, OR=161.158, 95% CI=12.343-2104.177) and after ($p = 0.000$, RO=133.368).

DISCUSSION

Obstetrics emergency is the biggest problem that causes maternal mortality, where obstetric emergencies are dominated by hypertension in pregnancy (PEB / eclampsia) by 20.57%, with a mortality rate of 33.34%.⁷

Another study corroborated the results where, of the 70 deaths that occurred in the hospital, 55 of them were women whose residences were outside the city where they were located. Causes of death for 70 mothers included PEB/Eclampsia 27%, bleeding 17%, infection 30% and others 30%.⁸

Maternal age is a leading cause of death, with previous studies suggesting that the cause of the increased maternal mortality rate in the US is unknown but could include a higher maternal age at the time of first pregnancy.⁹ A meta-analysis study in Africa (Etopia, Tanzania, Kenya) that mothers aged 35 were associated with a 2.5 times increased risk of maternal death.¹⁰

Severe or severe obstetric conditions require the mother to be cared for in the intensive care unit and have good support equipment. Based on the study, it was found that there was a relationship between intensive care related to maternal mortality, where 50% of women were referred in critical condition requiring ICU care. According to WHO, providing basic and comprehensive PONEK services is a strategy to reduce MMR.¹¹



eISSN : 2579-8324 pISSN : 2579-8323

ANDALAS OBSTETRICS AND GYNECOLOGY JOURNAL

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Obstetric emergency management following standard hospital guidelines, strengthening the referral system, improving obstetric services with the ICU will result in harmless mothers and especially reduce maternal mortality. There is a significant difference between before and after ICU admission to maternal mortality.⁷

Maternal conditions in the era of the COVID-19 pandemic also played a role in increasing mortality and morbidity rates. When a pregnant mother is exposed to COVID-19, it will cause an increase in comorbidities or other comorbidities. One study found that during pregnancy, women with a diagnosis of COVID-19 had higher rates of pregnancy-induced hypertension (RR=1.46, CI95=1.05–2.02), preeclampsia/eclampsia (RR=1.76, CI95% = 1.27-2.43), and infections requiring antibiotics (RR = 3.38, 95% CI = 1.63-7.01), and there was an association with a greater risk for admission to the ICU (RR = 5 .04, 95% CI = 3.13-8.10) and referral to a higher level of care (RR, 6.07; 95% CI, 1.23-30.01).¹²

Data show that mothers with a COVID-19 diagnosis, compared with those without a COVID-19 diagnosis, have a substantially higher risk of pregnancy complications, including preeclampsia/eclampsia/HELLP syndrome, ICU admission, referral to a higher level of care, and infections requiring antibiotics, as well as premature birth and low birth weight. The risk of maternal death was 1.6%, which is 22 times higher in the group of mothers with a diagnosis of COVID-19. These deaths are concentrated in institutions from less developed areas, implying that when comprehensive ICU services are not fully available, COVID-19 in pregnancy can be deadly.¹²

Based on the findings of this study, it was known that 52 cases were referred to receive intensive care (ICU and ICU COVID-19), with the most co-morbidities being COVID-19 as many as 32 cases. Other data are cases of death that were treated (43 cases), only 2 cases that were treated did not receive intensive care, but with severe conditions (1 case each, suspected embolism, and DIC due to HPP). Based on these findings, it can be said that almost all deaths that occur are caused by severe maternal conditions (needing intensive care, and accompanied by comorbidities), and experiencing delays, so that when they come and undergo surgery, the mother's condition becomes worse. The condition of the mother who is dead and has not been acted upon can occur due to severe conditions (desaturation, decreased consciousness),

The main finding from another prospective observational study was that maternal mortality after cesarean delivery in Africa was 5.43 per 1000 operations (95% CI 3.1–7.8). Mothers in Africa are at least 50 times more likely to die after a cesarean delivery than mothers in high-income countries. The low access to cesarean delivery in Africa results in high perioperative risk for mothers presenting for surgery. Perioperative complications are common, with approximately one in six women experiencing perioperative complications following a cesarean delivery nearly 3 times that of women in the US.¹³

CONCLUSION

Obstetric emergencies, maternal age, intensive care, and operative measures are factors that cause maternal death. Surgery is the most dominant cause of maternal death 161 times.



eISSN : 2579-8324 pISSN : 2579-8323

SUGGESTION

It is hoped that there will be further research with a larger sample size with renewable variables including in-depth research related to COVID-19, given the high maternal mortality rate during the surge in cases of the COVID-19 pandemic. The need for strengthening in each network hospital, in order to maximize operating rooms, intensive rooms, both green zones and red zones. Periodic evaluation of maternal audits must be carried out on a regular basis so that maternal deaths can be learned in the future.

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