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ORIGINAL ARTICLE

Analysis of Maternal Morbidity and Mortality Referred to Tertiary Care Hospitals of Pakistan

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ABSTRACT

Background and Aim: Maternal morbidity is a major health problem affecting approximately millions of women annually and had a substantial influence on fetal and infant health that might lead to maternal mortality. Maternal mortality is an indicator of the quality of obstetric care in a community directly reflecting the utilization of health care services available. The present study was conducted in order to analyze the maternal morbidity and mortality cases referred to a tertiary care hospital.

Methodology: This cross-sectional study was conducted on 89 maternal deaths out of 9874 obstetrical admissions or births referred to department of Gynae/Obs of tertiary care hospitals i.e Makran Medical College, Turbat/ Teaching Hospital, Kech and Darul Sehat Hospital, Karachi over a period of five years from 2017 to 2021. All the pregnant women with gestation age >24 weeks admitted for any obstetrical emergencies were enrolled in this study. Patient's demographic characteristics, clinical features during admission, and maternal relevant information were collected on pre-designed proforma. SPSS version 21 was used for data analysis.

Results: Out of total 9874 births, maternal deaths were 89; the mortality incidence with prevalence was hemorrhage 7 (7.9%), hypertensive disorders 34 (38.2%), anesthetic issue 2 (2.2%), sepsis 14 (15.7%), and medical complications 31 (34.8%). The occurrence of direct and indirect maternal death was 55 (61.8%) and 34 (38.2%) respectively. The incidence of the mortality rate was 22.9%. Of the total 387 morbidity cases, hypertensive disorders were the prevalent cause with 295 (76.2%) cases followed by obstetric hemorrhage 55 (14.2%), medical complications 25 (6.5%), sepsis 11 (2.8%), and anesthetic complications 1 (0.3%). The incidence of morbidity was 77.4 per year.

Conclusion: Medical complications, sepsis, and hemorrhage are the leading causes of maternal mortality, followed by hypertensive disorders. Mortality and morbidity rates were 22.9% and 3.9% respectively. All of these causes can be avoided with proper antenatal care facilitation.

Keywords: Hemorrhage, Maternal mortality, Sepsis

INTRODUCTION

Maternal morbidity is a major health problem affecting approximately millions of women annually and had a substantial influence on fetal and infant health that might lead to maternal mortality. [1, 2] Maternal mortality is an indicator of the quality of obstetric care in a community directly reflecting the utilization of health care services available.[3] The death of pregnant women within 42 days of pregnancy termination regardless of pregnancy site or duration from any relevant causes is referred to as maternal mortality[4]. Tertiary care facilitation is required in pregnancies complications developed in 15% of cases with single maternal death as reported by the previous study[5]. Pakistan has a maternal mortality rate of 276 per 100,000 live births, making the lifetime risk of maternal mortality 38 times higher than in the developed world.[6] Morbidity cases are defined based on different inclusion criteria used in medical literature; intensive care admission, dysfunction of acute organ system, blood transfusion donor patients, severe obstetric complications in gestational age of 28th week and puerperium 42 days, and anesthetic complications[7-9].

The maternal morbidity worldwide burden is on the rise as per the world health organization depending on the socioeconomics and geographical status. The mortality and morbidity in developed countries are less than in less developed or developing countries[7]. Obstetric haemorrhage, pre-eclampsia or eclampsia and pregnancy-related sepsis are the major factors contributing to the higher mortality among women in tertiary hospitals.[10] Most maternal deaths are preventable if patients are given prompt appropriate treatment at the periphery and are timeously and swiftly referred to higher centres.[11] Reduced total fertility, increased per capita income, social stability, and maternal education are all factors that empower many countries to moderate maternal mortality. [12] Severe obstetric morbidity or obstetric near-miss is gaining interest internationally as a new indicator of the quality of obstetric care following maternal mortality statistics.[13] The current study aims was to analyze the mortality and morbidity cases referred to tertiary care hospital.

METHODOLOGY

This cross-sectional study was conducted on 89 maternal deaths out of 9874 obstetrical admissions or births referred to department of Gynae/Obs of tertiary care hospitals i.e Makran Medical College, Turbat/ Teaching Hospital, Kech and Darul Sehat Hospital, Karachi over a period of five years from 2017 to 2021. All the pregnant women with gestation age >24 weeks admitted for any obstetrical emergencies were enrolled in this study. Patient's demographic characteristics, clinical features during

admission, and maternal relevant information were collected on pre-designed proforma. All the pregnant women with HELLP syndrome known as preeclampsia variant of life-threatening complications name after hemolysis, elevated liver enzymes, and low platelet count, hemorrhage before, after, or during delivery (>500 ml), severe medical disease complications such as (nephropathy, AIDS, cardiomyopathy, thrombocytopenic purpura, etc.), required blood transfusion, admitted to ICU for laparotomy and hysterectomy, puerperal sepsis, and anesthetic accidents as per literature[15-17]. For effective data analysis, hypertensive disorder, sepsis, medical conditions, hemorrhage, and anesthetic complications were different categories of patients.

Demographic details such as age, discharge diagnosis, blood transfusion, prenatal care (5 or more visits), ICU admission, gestational age, and newborn conditions were the investigating variables. The mortality rate was calculated by a number of deaths per morbidity cases time 100. For data analysis, SPSS version 21 was used. All the mortality and morbidity cases were stratified for age, gestational age, blood transfusion, prenatal care, and newborn conditions.

RESULTS

Of the total 9874 births, maternal deaths were 89; the mortality incidence with prevalence was hemorrhage 7 (7.9%), hypertensive disorders 35 (39.3%), anesthetic issue 2 (2.2%), sepsis 14 (15.7%), and medical complications 31 (34.9%). The occurrence of direct and indirect maternal death was 55 (61.8%) and 34 (38.2%) respectively in Figure-1. The incidence of the mortality rate was 22.9%. Of the total 387 morbidity cases, hypertensive disorders were the prevalent cause with 295 (76.2%) cases followed by obstetric hemorrhage 55 (14.2%), medical complications 25 (6.5%), sepsis 11 (2.8%), and anesthetic complications 1 (0.3%). The incidence of morbidity was 77.4 per year and morbidity rate was 3.9%. Various causes of maternal deaths are shown in Figure-2. Figure-3 illustrate the different causes of morbidity. Association of number of births, morbidity, and maternal deaths is shown in Table-1. Table-2 demonstrate association of morbidity, mortality and maternal deaths in each categories.

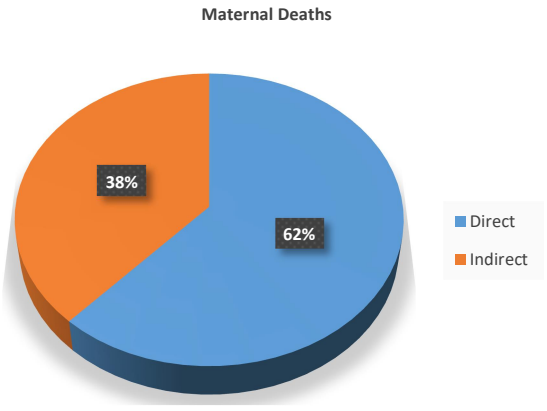

Figure 1: incidence of direct and indirect maternal deaths (n=89)

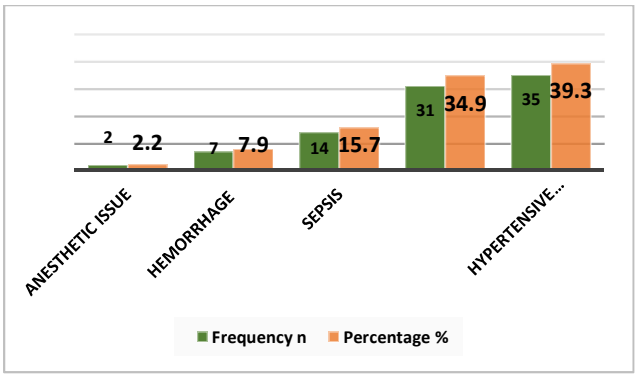

Figure 2: different causes of maternal deaths (n=89)

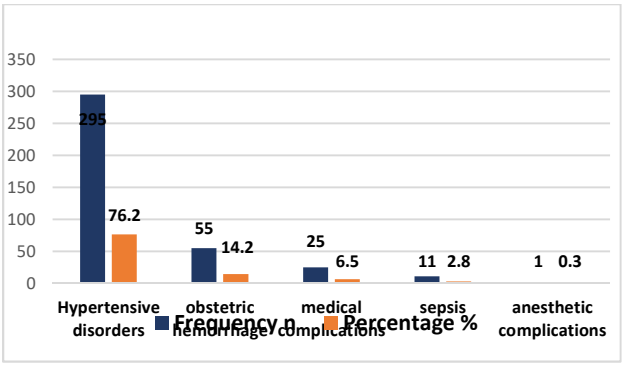

Figure 3: Different causes of morbidity (n=387)

Table 1: Association of number of births, morbidity, and maternal deaths

Year	Births	Morbidity /year	Maternal Deaths	Morbidity rate	Mortality Index %
2017	1922	64	19	3.3	29.7
2018	1934	66	15	3.4	22.7
2019	1837	77	27	4.2	35.1
2020	2,013	87	17	4.3	19.5
2021	2168	93	11	4.2	11.8
Total	9874	387	89	3.9	22.9

Table 2: Association of maternal deaths, morbidity, mortality rate in each category

Morbidity Causes	Frequency n	Maternal deaths	Mortality rate %
Hypertensive disorders	295	47	15.9
Medical complications	55	21	38.2
Sepsis	25	13	52
Hemorrhage	11	7	63.6
Anesthetic Issues	1	1	100
Total	387	89	22.9

DISCUSSION

Hypertensive disorders are the leading cause of maternal mortality followed by medical complications, sepsis, and hemorrhage. The mortality rate was 0.9%. Proper antenatal care facilitation can prevent all these causes. Hemorrhage, hypertensive disorders and ruptured uterus are the main reasons for maternal morbidity and mortality. The highest case fatality rates are associated with sepsis and indirect obstetric causes, specifically AFLP and peripartum cardiomyopathy. Sepsis also leads to high rates of secondary morbidities. A previous study found that 87.7%

were identified with morbidities, including 32% had post-partum hemorrhage (PPH), 18.1% had sepsis, 17.6% had hypertensive diseases, 1.6% had uterine perforation and 0.53% had peripartum cardiomyopathy.[18]

Another study showed that mechanical ventilator support was the commonest intervention required in the ICU followed by the inotropic support (33%). The maternal mortality rate was 33%[19]. Increasing global maternal morbidity represents a failure to meet broad public health goals of bettering the health of women and infants. All countries must implement surveillance initiatives to understand the burden of severe morbidity and review processes to assess potential preventability. The pattern of the major obstetric causes of morbidity and mortality has remained consistent over the last few decades, but the frequency of all causes has increased. Abortion complications, high blood pressure, postpartum hemorrhage, pre-existing medical conditions, antepartum hemorrhage are the five leading causes worldwide. [20, 21] The 387 morbidity cases account for 3.9% of total births. Obstetric morbidity and MM are inextricably linked. In our review, there were 89 maternal deaths, with hypertensive disorders (39.3%), medical conditions (34.9%), and sepsis as the leading causes (15.7%). Morbidity incidence was as follows during the same time period: hypertensive disorders (76.2%, hemorrhage 14.2%, and medical conditions 6.5%). Hemorrhage cases were the second most common cause of obstetric morbidity, but the fourth most common cause of maternal death.

Pregnancy at a young age heralds the beginning of long-term economic and social responsibilities, as the majority of these mothers have low income and few employment options, favouring a vicious cycle of poverty. The intergenerational repetition of adolescent pregnancy exacerbates the situation, increasing the risk of complications. [22, 23]. Being single or in a common-law marriage promotes social exclusion and lowers economic and medical expectations for women. 24 In our study, all of the patients were low-income and lacked access to medical care. There is need for increased antenatal coverage and emergency obstetrics services besides dedicated obstetric intensive care facilities at all public-sector hospitals to manage high-risk obstetric emergencies in order to limit morbidity.[24]

CONCLUSION

Medical complications, sepsis, and hemorrhage are the leading causes of maternal mortality, followed by hypertensive disorders. Mortality and morbidity rates were 22.9% and 3.9% respectively. All of these causes can be avoided with proper antenatal care facilitation.

REFERENCES

1. Biradar A, Mudanur SK. Umbilical coiling index and its association with perinatal mortality and morbidity in a low resource tertiary care hospital of northern Karnataka-a prospective observational study.
2. Soliriya V, Goyal M, Kachhawaha CP. Perinatal Mortality and Umbilical Cord Parameters: Is there Any Association? Journal of Pregnancy and Child Health. 2017. 4: 340.
3. Oğlak SC, Tunç Ş, Obut M, Şeker E, Behram M, Tahaoğlu AE. Maternal near-miss patients and maternal mortality cases in a Turkish tertiary referral hospital. Ginekologia Polska. 2021;92(4):300-5.
4. Desta M, Kassa GM, Getaneh T, Sharew Y, Alemu AA, Birhanu MY, Yeneabat T, Alamneh YM, Amha H. Maternal and perinatal mortality and morbidity of uterine rupture and its association with prolonged duration of operation in Ethiopia: A systematic review and meta-analysis. PloS one. 2021 Apr 22;16(4):e0245977.
5. Gulumser C, Engin-Ustun Y, Keskin L, et al. Maternal mortality due to hemorrhage: population-based study in Turkey. J Matern Fetal Neonatal Med. 2019; 32(23): 3998–4004.
6. Iwuh IA, Fawcus S, Schoeman L. Maternal near-miss audit in the Metro West maternity service, Cape Town, South Africa: A retrospective observational study. S Afr Med J. 2018; 108(3): 171–175.
7. Iwuh IA, Fawcus S, Schoeman L. Maternal near-miss audit in the Metro West maternity service, Cape Town, South Africa: A retrospective observational study. S Afr Med J. 2018; 108(3): 171–175.
8. Goldenberg RL, Saleem S, Ali S, et al. Maternal near miss in low-resource areas. Int J Gynaecol Obstet. 2017; 138(3): 347–355.
9. Benimana C, Small M, Rulisa S. Preventability of maternal near miss and mortality in Rwanda: A case series from the University Teaching Hospital of Kigali (CHUK). PLoS One. 2018; 13(6): e0195711.
10. Chikadaya H, Madziyire MG, Munjanja SP. Incidence of maternal near miss in the public health sector of Harare, Zimbabwe: a prospective descriptive study. BMC Pregnancy Childbirth. 2018; 18(1): 458.
11. Ozimek JA, Kilpatrick SJ. Maternal Mortality in the Twenty-First Century. Obstet Gynecol Clin North Am. 2018; 45(2): 175–186.
12. Obut M, Oğlak SC. Expression of CD44 and IL-10 in normotensive and preeclamptic placental tissue. Ginekol Pol. 2020; 91(6): 334–341.
13. El Ayadi AM, Nathan HL, Seed PT, et al. Vital Sign Prediction of Adverse Maternal Outcomes in Women with Hypovolemic Shock: The Role of Shock Index. PLoS One. 2016; 11(2): e0148729.
14. Ozimek JA, Kilpatrick SJ. Maternal Mortality in the Twenty-First Century. Obstet Gynecol Clin North Am. 2018; 45(2): 175–186.
15. CrossRefPubMed
16. Obut M, Oğlak SC. Expression of CD44 and IL-10 in normotensive and preeclamptic placental tissue. Ginekol Pol. 2020; 91(6): 334–341.
17. CrossRefPubMed
18. El Ayadi AM, Nathan HL, Seed PT, et al. Vital Sign Prediction of Adverse Maternal Outcomes in Women with Hypovolemic Shock: The Role of Shock Index. PLoS One. 2016; 11(2): e0148729.
19. Kassebaum NJ, Bertozzi-Villa A, Coggeshall MS, Shackelford KA, Steiner C, Heuton KR, et al. Global, regional, and national levels and causes of maternal mortality during 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet (London, England). 2014;384(9947):980–1004.
20. Mgawadere F, Unkels R, Kazembe A, van den Broek N. Factors associated with maternal mortality in Malawi: application of the three delays model. BMC Pregnancy Childbirth. 2017 Jul 12;17(1):219. https://doi.org/10.1186/s12884-017-1406-5.
21. Sayed HA. Egypt's demographic opportunity (preliminary assessment based on 2017 census).UNFPA Egypt country office; 2018.
22. David E, Machungo F, Zanconato G, Cavaliere E, Fiosse S, Sululu C, et al. Maternal near miss and maternal deaths in Mozambique: a cross-sectional, region-wide study of 635 consecutive cases assisted in health facilities of Maputo province. BMC Pregnancy Childbirth. 2014;14:401.
23. Habte A, Wondimu M. Determinants of maternal near miss among women admitted to maternity wards of tertiary hospitals in Southern Ethiopia, 2020: A hospital-based case-control study. PloS one. 2021 May 17;16(5):e0251826.
24. Isaacs R, Mandrelle K. Histopathological findings of hysterectomy specimens in cases of Severe Acute Maternal Morbidity. International Journal of Health and Clinical Research. 2021 May 27;4(10):164-6.