Biological and Clinical Sciences Research Journal
eISSN: 2708-2261; pISSN: 2958-4728
www.bcsrj.com
DOI: https://doi.org/10.54112/bcsrj.v6i5.1700
*Biol. Clin. Sci. Res. J., Volume 6(5), **2025**: 1700*
Original Research Article

Perinatal Mortality and Its Causes at Jinnah Postgraduate Medical Center, Karachi

Misbah Khan, Shazia Naseeb

Department of Obstetrics and Gynecology, Jinnah Postgraduate Medical Centre, Karachi, Pakistan
**Corresponding author`s email address: misbahkhan1850@yahoo.com*

(Received, 24th April 2025, Accepted 18th May 2025, Published 31st May 2025)

Abstract: *Perinatal mortality, according to the WHO, is the number of babies who die at or after 28 weeks of pregnancy or within seven days of birth. Perinatal mortality rate defines the health care status of a country. Pakistan specifically has a comparatively high perinatal mortality (PNMR), and it remains a challenge to improve maternal and neonatal health.* ***Objective:*** *To analyze perinatal mortality cases over a one-year period, from January 1st, 2023, to December 31st, 2023.* ***Method:*** *This study was conducted as a chart review of perinatal deaths that occurred in Ward 8 of Jinnah Postgraduate Medical Centre (JPMC) in Karachi in one year and determined major causes, including fetal asphyxia, congenital anomalies, placental complications, infection and low birth weight.* ***Results:*** *The PNMR was 60.5 per 1000 live births, and it revealed significant gaps needed for health improvement when compared with developed countries. Lack of antenatal care and ineffective antepartum and intrapartum care were major causes of high mortality levels.* ***Conclusion:*** *The study highlights the need for improving antenatal, intrapartum, and neonatal care, campaigns being run in the community and better ways of data management. These interventions can only prevent perinatal mortality and enhance maternal and newborn health in Pakistan.*

Keywords: Perinatal mortality, perinatal mortality rate, perinatal mortality in Pakistan, perinatal mortality in tertiary care hospital

[***How to Cite:*** Khan M, Naseeb S. Perinatal mortality and its causes at Jinnah postgraduate medical center, Karachi. *Biol. Clin. Sci. Res. J.*, **2025;** 6(5): 175-178. doi: https://doi.org/10.54112/bcsrj.v6i5.1700

Introduction

Perinatal mortality as per World Health Organization (WHO) is the ratio a babies born with no life signs at or after 28 weeks of gestation or a baby born of 1000g or more as well as neonatal death (first seven days of life). This definition is implicated for third world country like Pakistan. (1) Perinatal mortality can be indicator of the health care provided to a woman and child before, during and after delivery. An antepartum stillbirth refers to the death of fetus in the uterus of the mother before the onset of labor. An intrapartum stillbirth refers to the stillbirth, which occurs during the process of labor but before birth of the baby. A neonatal death refers to the death of a baby, which was born alive but died in the first 7 days (early) or within 28 days (late) of life. (2) Perinatal mortality includes the stillbirths as well as early neonatal deaths per 1000 live births as well as neonatal death. (1)

It also defines the health status of a nation (care given to pregnant women and the newborns). Perinatal mortality imposes a huge health, social and economical constraint for both health care providers and families. The demise of a baby is a devastating event for the parents, family members and health care providers. It can lead to depression, post-traumatic stress disorder, anxiety and separation between the affected parents. In such scenarios, measures should be taken to reduce the perinatal mortality. Some of these perinatal deaths can be prevented but others are not preventable. (3)

According to WHO, almost 2.6 million stillbirths occur worldwide and almost 2.7 million neonates die worldwide each year. Out of all these, almost 1.3 million deaths occur during intrapartum period. (4) Due to improved care provided to the pregnant women, perinatal outcome has improved in the developed countries. Perinatal mortality rate is still high in the developing countries like Pakistan. There are multiple risk factors, which increase the risk of perinatal mortality in Pakistan. (5) The major fetal cause of perinatal mortality in Pakistan is fetal asphyxia followed by growth disorders and fetal infection. Maternal causes include hypertensive disorders followed by maternal infection and anemia. More than 90% of these mortalities are associated with placental and umbilical cord conditions (hemorrhage and placental hypoperfusion). Other factors include lack of education, decreased birth spacing, low birthweight, prematurity, high parity, decreased number of skilled birth attendants, non-availability of physicians for newborns, inadequate health care system availability, poor dietary supplementation, lesser women empowerment, less BMI, and lesser antenatal visits. (6)

According to MBRRACE UK perinatal mortality surveillance report 2018, published in December 2020, their extended perinatal mortality rate is 5.1 per 1000 births. (7) According to National Centre for Health Statistics (NCHS) America 2019 report, perinatal mortality rate of America was found to be 5.69 per 1000 births. (8) According to Australian institute of health and welfare, perinatal mortality rate of Australia for the year 2019 was 9.6 per 1000 births. (9) In Pakistan, as per DHS (Demographic Health Survey), the perinatal mortality rate in Pakistan is of 47 deaths per 1,000 pregnancies, but the statistics are underestimated. (10)

JPMC is the prime referral hospital of the Karachi city. The obstetrics and gynecology department is an 80 beds facility with admission exceeding 12000 and 7500 to 8000 deliveries each year. Four previous studies were conducted in JPMC for identification of perinatal mortality rate (PNMR). PNMR was found to be 92/1000 in 1965-67, 101.8/1000, 97.2/1000 in 2007 and 60.1 per 1000 total birth in year 2010. (11)

Therefore, considering the above facts, we conducted this study with the aim to measure perinatal mortality rate (PNMR) and the risk factors associated with perinatal mortality in a tertiary care hospital in the year 2023.

Methodology

This is a cross-sectional, retrospective analysis of perinatal mortality in one year from January 1st, 2023, to December 31st, 2023, of Ward 8 of JPMC.

The study used all perinatal deaths that occurred within Ward 8 in JPMC during the above-mentioned period. Both inclusion and exclusion criteria

were used to decide which cases to use to collect consistent and reliable data.

Women 18–45 years of any booking status, with pregnancies of 28 or more weeks, of any parity, who delivered by SVD or cesarean section, with any previous mode of delivery in ward 8. Any delivery that was complicated by factors like hypertension and its complications, diabetes, infections, asthma and others as well as presenting with any complain were considered in the study.

Outpatients' data who delivered outside JPMC, patients with age ≤18 or ≥45 years and fetuses with gestational age <28 weeks were excluded.

Semi structured proforma was implemented to collect data which included name of the patient, age of the patient, hospital registration number, Booking status, Parity of mother, Date and time of birth, mode of delivery (Cesarean section / normal vaginal birth), and associated risk factors. Infant data included Gestational age, Birthweight, gender of baby, type of stillbirth (FSB/MSB/NND), and Cause of perinatal death. Descriptive statistical tools were used for data analysis of stillbirths and other variables. Data presentation tools that were used in the analysis included bar graphs and pie charts. Data was categorized as per new criteria of classification of stillbirth, which is called as relevant condition at death (ReCoDe). This classification relies on maternal and obstetrics risk factors for the quantification of cause of perinatal death. It provides clinically relevant and extensive classification for perinatal deaths. It is also easier to implement in a third world country like Pakistan.

Ethical clearance for the study was sought from the Institutional Review Board (IRB) at JPMC, and participants' consent was sought. Data protection was upheld by minimizing the use of personal information where such details were removed to obscure the identities of the patients.

Results

There were 6853 deliveries during the period of one-year i.e. from January 1st, 2023, to December 31st 2023 and 415 perinatal deaths were reported. Table 1 defines the outline of the study. The stillbirths (SB) were 303 (73.01%) while the neonatal deaths (NND) were 112 (26.98 %).86 (20.7%) deaths occurred in booked patients while 329 (79.2%) occurred in un-booked patients. The mean maternal age was 32.2 years. 102 (24.5%) deaths were reported in Primi-gravida while 313 (75.4%) deaths were reported among multigravida. 337 (81.2%) deaths were reported among pre term infants while 78 (18.79%) were reported among term infants. There were 149 (35.9%) macerated stillbirths (MSB) and 154 (48.8%) fresh stillbirth (FSB). Almost 281 (67.7%) patients delivered via spontaneous vaginal delivery (SVD) while 134 (32.2%) delivered via lower segment cesarean section (LSCS). The study revealed a high perinatal mortality rate of 60.5 per 1,000 live births in Ward 8 of JPMC. The leading cause of death was antepartum hemorrhage, which comprise of 126 cases (30.3%); among these abruption was the leading cause of perinatal death 97 (23.37%). The second leading cause were hypertensive emergencies, which comprise of 96 deaths (23.13%).

Table 1 Demographic of the study population:

Booking Status	**SB**	**NNDs**	**Total**	**%**
Booked	58	28	86	20.72%
Unbooked	245	84	329	79.27%
Maternal Age				
15-20 years	64	30	94	22.65%
21-30 years	187	66	253	60.96%
31-40 years	31	9	40	9.63%
>40 years	21	7	28	6.74%
Parity				
0+0	74	28	102	24.57%
1-4	143	61	204	49.15%
5 & above	86	23	109	26.26%
Gestational Age				
28-32 weeks	136	70	206	49.63%
33-36 weeks	105	26	131	31.56%
>37 weeks	62	16	78	18.79%
Birthweight				
Normal BW (>2.5 kg)	93	26	119	28.67%
Low BW (<2.5-1.5 kg)	129	54	183	44.8%
Very LBW (<1.5 -1 kg)	70	29	99	23.85%
Very very LBW (< 1kg)	11	3	14	3.37%
Total	**303**	**112**	**415**	**100.0%**

Table 2 The causes of deaths as per Relevant Condition at Death (ReCoDe).

		SB	**NND**	**Total**	**Percentage**
Group A Fetus	Congenital anomalies	9	16	25	6.02%
	Infections	0	1	1	0.24%
	IUGR	9	3	12	2.89%
	Isoimmunization	0	0	0	0%
	Hydrops fetalis	2	1	3	0.72%
	Co twin IUD	1	0	1	0.24%
	Selective IUGR in twin pregnancy	0	1	1	0.24%
Group B	Prolapse	1	1	2	0.48%

Umbilical Cord	Constricting loop	0	0	0	0%
	Velamentous insertion	0	0	0	0%
Group C Placental	Abruption	85	12	97	23.37%
	Previa	15	6	21	5.06%
	Previa+ Abruption	3	2	5	1.20%
	Morbidly adherent placenta	1	2	3	0.72%
Group D Amniotic fluid	Polyhydramnios	2	0	2	0.48%
	Oligohydramnios	1	2	3	0.72%
	PPROM	3	2	5	1.20%
	Chorioamnionitis	3	1	4	0.96%
Group E Uterus	Rupture	14	1	15	3.61%
	Uterine anomaly	0	0	0	0%
Group F Mother	Pre-Eclampsia	39	9	48	11.56%
	Eclampsia	25	5	30	7.22%
	HELLP syndrome	13	5	18	4.33%
	Diabetes	12	1	13	3.13%
	Heart disease	2	0	2	0.48%
	Jaundice	3	1	4	0.96%
	Anemia	5	3	8	1.97%
	APLA/thrombophilia	1	1	2	0.48%
	Drug abuse	0	0	0	0%
	Transfusion Reaction	2	1	3	0.72%
Group G Intrapartum	Birth asphyxia	2	12	14	3.37%
	Hand prolapse	3	2	5	1.20%
	Obstructed labour	2	2	4	0.96%
	Prolonged labour	13	6	19	4.57%
	Breech in labour	8	3	11	2.65%
	Brow/compound presentation	2	3	5	1.20%
Group H Trauma	External	1	0	1	0.24%
	Iatrogenic	0	0	0	0%
Group I Unclassified	No relevant condition identified	3	4	7	1.68%
	No information available	18	3	21	5.06%
Total		**303**	**112**	**415**	**100%**

Discussion

Pakistan is among the third world countries with the highest perinatal mortality rate. This situation is alarming. Current study, estimated high perinatal mortality rate which is 60.55 per 1000 livebirths, which is significantly contrasts with the data published by Demographic and Health Survey Pakistan which showed PNMR of 47 per 1000 live births as per one study. The higher perinatal mortality rate in JPMC could be, JPMC being the prime referral center, admission of unbooked cases and higher number of patients admission. Cooperating data from industrialized countries, including the UK and the USA with a range of 5.69 per 1,000 birth and 5.54 per 1000 birth respectively. (7, 8) In one of the study, the PNMR in Pakistan was found to be varied from 58 to 91. Among all the countries in South Asia, Pakistan had the poorest perinatal outcome with high PNMR. (12)

As per our study, it was observed that the most common cause of perinatal mortality was found to be antepartum hemorrhage which comprise of 126 cases (30.3%); among these abruption was the leading cause of perinatal death 97 (23.37%). The second most common cause was hypertensive emergencies. Both of these conditions are preventable if risk factors are identified promptly. One of the study showed that in Pakistan, preterm babies born to mother with complication of antepartum hemorrhage and hypertensive disorders were more likely to die. The neonatal factor which were predictor of neonatal mortality were congenital malformation, temperature less than <35.5 and NICU admission. (13)

Another important factor of perinatal mortality was complications arising during intrapartum care. These included prolonged labour, obstructed labour, malpresentation, birth asphyxia and hand prolapse. Current study showed increased perinatal mortality among multiparous women which was 313 (75.4%). Although, proper education of the society, early detection of risks factors, prompt identification of complication and timely referral to a tertiary care hospital may decrease the perinatal mortality.(14)

In comparison to this study, lower rates of perinatal mortality has been identified in developed countries where they have developed more advanced health care structure, Quality of care in hospitals, Effective interventions, Access to skilled healthcare, improved sanitation and hygiene.(13)

Our study concluded that 337 (81.2%) deaths were reported among pre term infants while 78 (18.79%) were reported among term infants. The higher frequency of pre term infants was also due to higher rates of induced labour and LSCS due to deteriorating maternal and fetal condition. This highlights the importance of proper antenatal care for mothers with optimization of their health so that such complications can be avoided. Poor antenatal care is associated with higher perinatal mortality. These findings are consistent with data obtained from developed and developing countries all around the world. (14)

Peculiarly, our study has shown higher rate of macerated stillbirth 35.9%, which is interestingly higher than developed countries but comparable to developing countries. It is identifiable that maceration is the sign of fetal demise at least 12 hours before delivery and fresh stillbirth indicate intrapartum demise. This classification stresses on the fact that improved antenatal care can reduce MSB fetuses while good care during labour and delivery can reduce FSB and NND fetuses [14]

Higher rates of macerated stillbirth in our study were due to considerable factors like late identification of complication, lack of identification risk

factors during antenatal period, late referrals by health care personnel, lack of education, late arrival to hospital and lack of transporting facilities. (15)

Conclusion

Neonatal and perinatal mortality continues to be an important public health problem in Pakistan. This audit reveals that the causes of perinatal deaths are mainly antepartum hemorrhage and hypertensive disorders. These risks are heightened further by unbooked pregnancies, lack of proper antenatal care, unavailability of timely transfer, late identification of risk factors and lack of identification of maternal and fetal complication. Multiparous women and preterm infants are at higher risk of perinatal death. As a result, of this audit of Ward 8 at JPMC, we pointed out that multifaceted healthcare initiatives are required for better maternal and neonatal health and decreased perinatal mortality rate in Pakistan.

Declarations

Data Availability statement
All data generated or analysed during the study are included in the manuscript.
Ethics approval and consent to participate
Approved by the department concerned. (IRBEC-24)
Consent for publication
Approved
Funding
Not applicable

Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

MK (FCPS Trainee)
Manuscript drafting, Study Design,
SN (Associate Professor)
Review of Literature, Data entry, Data analysis, and drafting articles.

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

References

1. Souza JP, Cecatti JG, Faundes A, Morais SS, Villar J, Carroli G, et al. Maternal near miss and maternal death in the World Health Organization's 2005 global survey on maternal and perinatal health. Bulletin of the World Health Organization. 2010;88(2):113-9.
2. Helps A, Leitao S, Greene R, O'Donoghue K. Perinatal mortality audits and reviews: past, present and the way forward. European Journal of Obstetrics & Gynecology and Reproductive Biology. 2020;250:24-30.
3. Arach AAO, Nakasujja N, Nankabirwa V, Ndeezi G, Kiguli J, Mukunya D, et al. Perinatal death triples the prevalence of postpartum depression among women in Northern Uganda: A community-based cross-sectional study. PLoS One. 2020;15(10):e0240409.
4. de Castro Vasconcelos AMP. When, Where and why: Do Newborns not Only Get Sick But Also Die in Sao Tome & Principe: Analysis of Causes and Risk Factors Contributing to Perinatal and Neonatal Morbidity and Mortality in A Developing Country–A Case–Control Study: Universidade NOVA de Lisboa (Portugal); 2023.
5. Goldenberg RL, Saleem S, Goudar SS, Silver RM, Tikmani SS, Guruprasad G, et al. Preventable stillbirths in India and Pakistan: a prospective, observational study. BJOG: An International Journal of Obstetrics & Gynaecology. 2021;128(11):1762-73.
6. Aziz A, Saleem S, Nolen TL, Pradhan NA, McClure EM, Jessani S, et al. Why are the Pakistani maternal, fetal and newborn outcomes so poor compared to other low and middle-income countries? Reproductive Health. 2020;17:1-12.
7. Dale CE, Takhar R, Fan YY, Torabi F, Kim S, Lambarth A, et al. Preprint not peer reviewed.
8. Valenzuela CP, Gregory EC, Martin JA. Decline in perinatal mortality in the United States, 2017-2019. 2022.
9. Chan L, Owen KB, Andrews CJ, Bauman A, Brezler L, Ludski K, et al. Evaluating the reach and impact of Still Six Lives: A national stillbirth public awareness campaign in Australia. Women and Birth. 2023;36(5):446-53.
10. Anwar J, Torvaldsen S, Sheikh M, Taylor R. Under-estimation of maternal and perinatal mortality revealed by an enhanced surveillance system: enumerating all births and deaths in Pakistan. BMC Public Health. 2018;18:1-14.
11. Korejo R, Naseeb S, Yasmin H, Ahmed S. Audit of perinatal mortality at Jinnah Postgraduate Medical Centre Karachi. Journal of Bahria University Medical and Dental College. 2014;4(1):20-4.
12. Tahir I, Ahsan I, Nadeem I, Ali K, bin Amir M, Khan RM, et al. Perinatal Mortality Rate in Pakistan and other South-Asian Countries. Journal of Society of Prevention, Advocacy and Research KEMU. 2023;2(4):287-98.
13. Maugeri A, Barchitta M, Schillaci G, Agodi A. Spatial patterns and temporal trends in stillbirth, neonatal, and infant mortality: an exploration of country-level data from 2000 to 2021. Journal of Global Health. 2025;15:04034.
14. Memon Z, Fridman D, Soofi S, Ahmed W, Muhammad S, Rizvi A, et al. Predictors and disparities in neonatal and under 5 mortality in rural Pakistan: cross sectional analysis. The Lancet Regional Health-Southeast Asia. 2023;15.
15. Nakamya P, Komakech A, Migamba SM, Biribawa C, Kwesiga B, Bulage L, et al. Trends and geospatial distribution of stillbirths in Uganda, 2014–2020. BMC Pregnancy and Childbirth. 2024;24(1):249.