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EFFECT OF MATERNAL COMORBIDITIES ON NEONATAL MORTALITY AND MORBIDITY: A HOSPITAL BASED STUDY

Paediatrics

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ABSTRACT

Aim And Background: The aim of the study was to determine the effect of maternal comorbidities on neonatal mortality and morbidity. **Material And Methods:** This is a hospital based, cross-sectional study which was conducted in the Department of Obstetrics and Gynecology and Department of Pediatrics, Muzaffarnagar medical college, Muzaffarnagar. All pregnant women were interviewed in detail regarding various bio-socioeconomic characteristics, history of past and present obstetric and medical complications. All the information collected and observations made were collected on a pretested proforma. **Result:** We observed that neonatal mortality and morbidity revealed a statistically significant (p-value<0.05) relation of all parameters with both morbidity and mortality in neonates. **Conclusion:** In our study out of various co-morbidities in mothers, most important cause of neonatal mortality and morbidity is anaemia. Other co-morbidities like diabetes, previous caesarean, ante-partum haemorrhage, eclampsia and Oligohydramnios will lead to increase in neonatal mortality and morbidity as in our study it as shows statistically significant relation.

KEYWORDS

Neonatal mortality, Neonatal morbidity, Perinatal mortality rate.

INTRODUCTION:

Perinatal mortality rate is defined as the number of still births and the death occurring in first week of life per thousand live births. It is the most sensitive index of maternal and neonatal care. 98% of perinatal deaths occur in developing countries. Perinatal mortality is an important indicator for monitoring progress towards Millennium Development Goal. Without reducing perinatal mortality it is not possible to reduce neonatal mortality rate, infant mortality rate& under 5 mortality rate. Among the main causes of perinatal mortality high risk pregnancies comprise the commonest one[1]

Most of the neonatal deaths happen without a clear reason of death (i.e., pre-maturity) especially in low-income countries. Because of various associated factors to the actual underlying reason of the neonatal mortality, it becomes difficult to authenticate the cause.[2] The diseases affecting mothers like pre-eclampsia, hospitalization during the present pregnancy, diabetes and compromised antenatal care, can cause neonatal mortality.[3]

Infections affecting mothers, like the "TORCH" pathogens (Toxoplasma gondii, other infections, rubella, cytomegalovirus, and herpes simplex) are liable to various malformations and defects affecting fetus that can be mild or highly devastating. Intrauterine infection can cause a considerable rise in neonatal morbidity and mortality, with different short- and long- term effects on health and development of children.[4] India has made considerable progress over the last two decades in the area of maternal and child health, through innovative and comprehensive health packages that covers the spectrum of reproductive child health (RCH).

Improving the maternal and child health and their survival are central to the achievement of national health goals under the National Rural Health Mission (NRHM) as well as the Millennium Development Goals (MDG) 4 and 5. In the past seven years, innovative strategies evolved under the national programme of India to deliver evidence-based interventions to various population groups.[5]Need for the study: Since neonatal outcome is greatly dependent on the maternal clinical profile and due to paucity of data in this field. We aim to conduct this study at our tertiary care center by periodical statistical data collection in our tertiary care center.

MATERIAL AND METHODS:

Study design: Hospital based cross sectional study

Study Period: January 2021 to July 2022

Study Population: All deliveries occurring in the department of obstetrics and gynaecology, MMCH, Muzaffarnagar during study period.

Sample Size: According to Ministry of health and family welfare, the neonatal mortality rate of Uttar Pradesh is 41/1000.[6] Using this data, the following formula has been applied to determine the required sample size for the study, taking a relative error of 12% at 95% confidence interval, a minimum sample size of 400 was calculated.

Sampling technique: Simple random sampling with complete enumeration of all eligible children till the sample size was achieved.

The major outcomes are neonatal mortality and morbidity.

Data collection: All pregnant women were interviewed in detail regarding various bio-socioeconomic characteristics, history of past and present obstetric and medical complications. Their antenatal records (whenever available) and case sheets were also examined. All the information collected and observations made were collected on a pretested proforma, prepared after detailed review of literature.

Data analysis

The data was entered into the Microsoft excel and statistical analysis was performed by statistical software IBM SPSS version 20.0. The quantitative variable were present in the form of frequency and percentage and qualitative variable in the form of frequency and percentage and mortality and morbidity rates

Ethical review

The study does not include any experimentation. Patient 's attendant was informed of the procedure done in detail and informed consent was obtained. No one received any benefit, personal or professional from a commercial party directly or indirectly including the subject of the study.

Approval was obtained from the institution ethics committee at the start of the study.

No conflict of interest

OBSERVATION AND RESULTS:

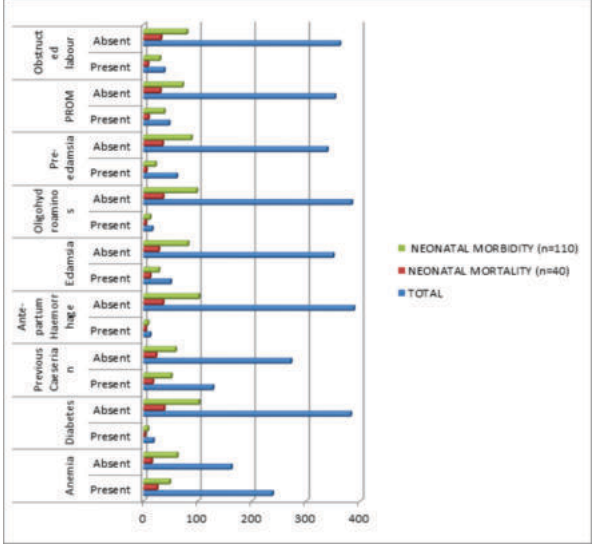
The present study was conducted in the Department of Pediatrics, Muzaffarnagar Medical College and Hospital, Muzaffarnagar, between June 2021 to June 2022.

This cross-sectional study was carried out with enrolment of 400 confirmed in-born deliveries to assess the co-relation of neonatal mortality and morbidity with maternal co-morbidities. Variables taken

for study are maternal anaemia, diabetes, previous caesarean section, antepartum haemorrhage, eclampsia, oligohydramnios, pre-eclampsia, Premature rupture of membranes, obstructed labour, polyhydramnios.

Table No. :- 1 Co-relation Of Co-morbidities And Neonatal Mortality And Morbidity

Factor		TOTAL	NEONATAL MORTALITY (n=40)		NEONATAL MORBIDITY (n=110)	
			NO.	PERCENTAGE	NO.	PERCENTAGE
Anemia	Present	238	25	62.5	48	43.63636
	Absent	162	15	37.5	62	56.36364
Chi square			2.220		2.189	
p-value			0.032*		0.043*	
Diabetes	Present	18	2	5	8	7.272727
	Absent	382	38	95	102	92.72727
Chi square			1.009		1.661	
p-value			0.0001*		0.002*	
Previous Caesarean	Present	128	17	42.5	51	46.36364
	Absent	272	23	57.5	59	53.63636
Chi square			2.169		2.178	
p-value			0.016*		0.044*	
Ante-partum Haemorrhage	Present	12	4	10	8	7.272727
	Absent	388	36	90	102	92.72727
Chi square			1.771		1.619	
p-value			0.003*		0.031*	
Eclampsia	Present	50	12	30	28	25.45455
	Absent	350	28	70	82	74.54545
Chi square	1.005	1.425				
p-value	0.005*	0.041*				
Oligohydramnios	Present	16	4	10	12	10.90909
	Absent	384	36	90	98	89.09091
Chi square	1.771	1.119				
p-value	0.003*	0.011*				
Pre-eclampsia	Present	61	5	12.5	22	20
	Absent	339	35	87.5	88	80
Chi square	2.228	2.267				
p-value	0.041*	0.011*				
PROM	Present	47	9	22.5	38	34.54545
	Absent	353	31	77.5	72	65.45455
Chi square	1.189	2.150				
p-value	0.044*	0.047*				
Obstructed labour	Present	38	8	20	30	27.27273
	Absent	362	32	80	80	72.72727
Chi square	1.115	2.123				
p-value	0.005*	0.003*				



We observed that neonatal mortality and morbidity was present in 62.5% and 43.63% cases with mothers suffering with anemia and in 5% and 7.3% cases suffering with mothers having diabetes. We observed that neonatal mortality and morbidity was present in 42.5% and 46.3% cases whose mothers had history of previous caesarean, 4% and 7.3% cases whose mothers had history of ante-partum hemorrhage,12% and 25.45% cases whose mothers had eclampsia in 10% and 10.9% cases whose mothers had Oligohydramnios respectively. It was observed that neonatal mortality and morbidity was present in 5% and 20% cases whose mothers had Pre-eclampsia in 22.5% and 34.5% cases whose mothers had PROM and in 20% and 27.27% cases whose mothers had Obstructed labor respectively. Chi square statistical analysis revealed a statistically significant (p-value<0.05) relation of all parameters with both morbidity and mortality in neonates.

DISCUSSION:

The mortality rate in neonates is measured to be around 44% of the total under five deaths worldwide. The maximum risk of death to the child occurs in the first 30days of their life, with an average mortality rate of 18 deaths per 1,000 live births globally.[7,8]] Similar to our study, Fitzpatrick KE et al [9] and Carolan MC et al [10] showed a raised risk of unfavourable perinatal outcomes with the advancement of maternal age and comorbidities in mother was well stated. Some studies have found an increased risk of preeclampsia, antepartum haemorrhage, ICU admission and PPH and bad obstetrics are some important causes of neonatal mortality and morbidity. In our study it was observed that neonatal morbidity and mortality was present inmaximum 36.36% and 47.5% cases with mothers having no bad obstetric history.

A.fahad et al a prospective cohort study conducted in about 114,000 pregnant women in South Asia and sub-Saharan Africa shows that a third of women suffer from a direct maternal morbidity. The proportion of women with direct maternal morbidity was greater in South Asia (44%) than in sub-Saharan Africa (24%), largely because of a greater prevalence of pregnancy-related infections. Pregnancy-related death, neonatal mortality, and stillbirth rates. The study clearly demonstrated that direct maternal morbidity is associated with pregnancy-related deaths, stillbirths, and neonatal deaths.[11]Perinatal mortality is three to five folds higher in women with preeclampsia/eclampsia syndrome as compared to those without the disorders. [12,13] Perinatal asphyxia, preterm birth and other complications have been also reported in the studies included in the review. Although the exact mechanisms for the above mentioned perinatal complications are not yet well known, the most acceptable theory for the development of preeclampsia is defective remodelling of spiral arteries. Defective placentation affects utero-placental blood flow and leads to complications such as preterm birth, low birth weight, perinatal asphyxia, and fetal growth restriction [14, 15]. All these results have significant effects on clinicians and policy makers. For clinicians, the history of neonatal mortality in mothers can be a significant marker for recognizing and treating the high-risk pregnancies and neonates being born in these conditions.

CONCLUSION:

Neonatal mortality and morbidity are sensitive indicator of the quality of health care provided to pregnant women and the new born. Among various co-morbidities in mothers taken in our study most important cause neonatal mortality and morbidity is anaemia. Other co-morbidities like diabetes, previous caesarean, ante-partum haemorrhage, eclampsia and Oligohydramnios will lead to increase in neonatal mortality and morbidity as in our study it as shows statistically significant relation. Awareness of the special vulnerability of the mothers with high risk factors had led to the popular recognition of risk approach. Identification of those maternal risk factors which significantly affect outcome of pregnancy enables us for timely and effective interventions and thus reduces the need for intensive care along with optimal utilization of available medical resources.

LIMITATION:

1.The present study was conducted to limited sample size. Thus future studies are required to
be conducted on more number of patients.
2. As the present study was cross-sectional in nature, thus we cannot declare the causality in
the observed relations.
3. The study was limited to our hospital centre only, so results cannot be generalized to whole
Indian population.
4. Although we considered various covariates to decrease the

confounding bias, but still we cannot rule out the probability of remaining confounding bias completely because of presence of the unknown confounders.

REFERENCES:

1. Manisha behal *et al*; maternal risk factors for perinatal mortality, indian journal of Obstetrics and gynecology research, april-june 2015;2(2):92-96.
2. Mengesha HG, Sahle BW. Cause of neonatal deaths in Northern Ethiopia: a prospective cohort study. BMC Public Health. (2017) 17:62.
3. Malhotra A, Allison BJ, Castillo-Melendez M, Jenkin G, Polglase GR, Miller SL. Neonatal morbidities of fetal growth restriction: pathophysiology and impact. Front Endocrinol. (2019) 10:55.
4. Sankar MJ, Neogi SB, Sharma J, Chauhan M, Srivastava R, Prabhakar PK, Khera A, Kumar R, Zodpey S, Paul VK. State of newborn health in India. J Perinatol. 2016 Dec;36(s3):S3-S8. doi: 10.1038/jp.2016.183. PMID: 27924104; PMCID: PMC5144119.
5. A strategic approach to reproductive, maternal, new-born, child and adolescent health (rmnch+a) in India 2013.
6. History of Health and family Welfare; status of IMR and MMR in India 2022.
7. UN IGME. (2019). United Nations Inter-agency Group for Child Mortality Estimation Inter-agency Group for Child Mortality Estimation (IGME): Levels and Trends in child mortality. 2012. United Nation Inter-agency Group for child mortality estimation.
8. Tekelab T, Chojenta C, Smith R, Loxton D. The impact of antenatal care on neonatal mortality in sub-Saharan Africa: A systematic review and meta-analysis. PLoS One. 2019 Sep 13;14(9):e0222566. doi: 10.1371/journal.pone.0222566. PMID: 31518365; PMCID: PMC6743758.
9. Fitzpatrick KE, Tuffnell D, Kurinczuk JJ, Knight M. Pregnancy at very advanced maternal age: a UK population-based cohort study. BJOG. 2016 Sep 1.
10. Carolan MC, Davey MA, Biro M, Kealy M. Very advanced maternal age and morbidity in Victoria, Australia: a population based study. BMC Pregnancy Childbirth. 2013;13:80.
11. A.Fahad et al; Direct maternal morbidity and the risk of pregnancy-related deaths, stillbirths, and neonatal deaths in South Asia and sub-Saharan Africa: A population-based prospective cohort study in 8 countries, Published online 2021 Jun 28. doi: 10.1371/journal.pmed.1003644.
12. Abalos E, Cuesta C, Carroli G, Qureshi Z, Widmer M, Vogel JP, Souza JP, on behalf of the WHO Multicountry Survey on Maternal and Newborn Health Research Network. Pre- eclampsia, eclampsia and adverse maternal and perinatal outcomes: a secondary analysis of the World Health Organization Multicountry Survey on Maternal and Newborn Health. BJOG. 2014;121(Suppl. 1):14–24.
13. Roberts JM, Pearson G, Cutler J, Lindheimer M. Summary of the NHLBI Working Group on research on hypertension during pregnancy. Hypertension. 2003;41(3 I):437–45.
14. Palatnik A, Grobman WA, Miller ES. Is a history of preeclampsia associated with an increased risk of a small for gestational age infant in a future pregnancy? Am J ObstetGynecol. 2016;215(3):355.e1.
15. Bramham K, Briley AL, Seed P, et al. Adverse maternal and perinatal outcomes in women with previous preeclampsia: a prospective study. Am J ObstetGynecol. 2011;204(6):512.e1.