



Effect Of Selected Maternal Factors On Birth Characteristics Of Newborns

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ABSTRACT

Background: Various maternal factors could help to determine the health status of newborns. The important contributors of child survival are good maternal health care and nutrition. Maternal infections and other poor conditions usually contribute as an indicator of neonatal morbidity and mortality. Some of the maternal factors reflect the genetic blueprint laid down for the newborn. Thus, newborn characteristics echo a complex combination of various maternal factors.

Material and methods: A descriptive cross sectional study is conducted at academic tertiary referral hospital with 100 newborns and their biological mothers by using non probability sampling to find the effect of selected maternal factors on birth characteristics of newborns by using structured proforma and descriptive inferential statistics was used to analyze the data.

Result: Among all samples 98% of newborns had no depression, 88% newborns anthropometry was normal and 95% newborns were appropriate to term gestation. Selected maternal factors had positive correlation on birth characteristics of newborns ($r = 0.9$)

Conclusion: It emphasis that selected maternal factors is good predictors of newborn characteristics. There by the future risk for complications, morbidity and mortality rate of mothers and newborns can be prevented by simple awareness in general population of mothers for improving health status and future development of newborns

Key words: Birth characteristics, Effect, Maternal factors, Newborns.

Introduction

The dimensions of maternal body are first factor decisively affecting neonatal bio-metrics, mainly their birth weight and length, which are closely connected to prenatal morbidity and mortality. While among the non-biometric maternal factor i.e. maternal age and parity known to play a paramount role in growth of fetus ^[1]

Maternal status of nutrition is also said to be an important indicant of infant's body dimensions and its early growth characteristics. Birth weight and length mostly depends on mother's nutritional^[2] and anthropometric factors,^[3] respectively showing evident genetic influence. Maternal infections and other poor conditions usually contribute as an indicator of neonatal morbidity and mortality (including stillbirths, neonatal deaths and other adverse clinical outcomes) ^[4]

Worldwide 50 million births happens to take place at home in the absence of skilled birth attendant^[5] The rates of lacking access to skilled birth care and emergency obstetric care are much high in low and middle income countries where mortality and morbidity related to complications of childbirth takes place ^[6]

Considering the belief that most maternal and child deaths are preventable using current knowledge, the burden of mortality and morbidities is unacceptably high. The preponderance of maternal deaths take place during labor, delivery, in the immediate post-natal period and with obstetric hemorrhage could be the main medical cause of death. Other causes of maternal mortality are hypertensive diseases, infections, obstructed labor, abortion related complications and so on. Moreover, the leading causes of neonatal mortality and morbidity are infections, complications arising from preterm birth, and intra-partum related neonatal deaths, which accounts 80% of all neonatal deaths worldwide ^[4]

In 2015, 20.5 million newborns, that is 14.6% of all newborns suffered from LBW. The World Health Assembly target is to reduce LBW by 30% between 2012 -2025^[7]. Indian statistical institute reported that 20% of newborns are LBW ^[8]. The data collected from Health Management Information Systems from 2018-19 by health minister that there are over 2 lakh newborns weighing below 2.5 kg and 12,147 fetal deaths because of LBW, premature birth, infections and so on ^[9]. Infant mortality rate of Maharashtra in NFHS-4 is 24 deaths before 1 year of age per 1000 live births, NFHS-3 estimate 51 deaths. Hence day by day mortality rate in mothers as well as in neonates is increasing just because of some maternal factors like young age of mothers at the time of delivery ^[7]. Aim of this study was to gather evidence by evaluating selected maternal factors through structured proforma and newborns assessment to find correlation among them, if any.

Materials and Methods

A descriptive cross-sectional design adopted for 100 newborns with their biological mothers admitted at single academic tertiary referral hospital in rural setting were studied using a structured proforma with non-probability sequential random sampling method. Antenatal mothers who were registered, single pregnancy with complete 37 weeks of gestation and newborns available during data collection were

only included. Mothers with irregular ANC visit and high risk (postnatal mothers and newborns) were excluded. This study has been approved by the institutional research/ethical committee

Initially socio-demographic data of the participants was collected by interviewing the mothers. Selected maternal (antenatal, intra-natal, postnatal) factors were assessed by structured performa and lastly evaluation of newborn characteristics was done by APGAR scoring, anthropometric measurements and new modified Ballard scale.

Results

Socio- demographic characteristics of mothers

Majority of the mothers were 20-25 years (73%) with secondary education (42%), homemaker (46%), Hindu (58%) belong to joint family (74%) had non-consanguineous marriage (86%) rural residence (80%) monthly family income with 3906-11707(66%).

The information regarding selected maternal factors is presented in **Table No. 1**

Newborn characteristics

Significant (98%) of newborns had no depression and (95%) of them were of term gestation, (4%) were preterm and (1%) were post-term with normal anthropometry(88%)

Correlation coefficient test was used to evaluate correlation between selected maternal factors and newborn chacteristics that obtained r value of 0.9, which interprets that selected maternal factors had positive correlation with newborn chacteristics.

Table No. 1 Description of Selected maternal factors

n=100

SN	Selected maternal factors	Percentage
1	Number of ANC visits	
	No visit	1%
	Only one visit	4%
	Two visits	24%
	Three and more visits	71%
2	Height of mothers	
	< 140 cm	6%
	141-145 cm	68%
	> 145 cm	26%
3	Weight of mother	
	< 50 kg	4%
	51-60 kg	60%
	61-70 kg	32%
	> 70 kg	4%
4	Gravida	
	Primigravida	94%
	Multigravida	6%
5	Gestational age at birth	
	37-38 weeks	7%
	39-40 weeks	92%
	> 40 weeks	1%
6	Placental weight	
	300-450 g	98%
	≥ 500 g	2%

Discussion

Newborns growth is vital predictors of child's future health status which are largely determined by selected maternal factors. Hence, some of these maternal factors are crucial prognosticators of pregnancy outcomes as they reflect genetic aspects like APGAR, anthropometry as well as physical and neurological maturity.

In the present study, selected maternal factors have strong positive correlation with newborns birth characteristics. There are strong epidemiological evidences of a relation between selected maternal factors and newborns birth characteristics resulting in a number of interventional studies on nutritional supplementation during pregnancy that have been carried out both in developing as well as in developed countries. Hence, this study evaluated effect of selected maternal factors on birth characteristics of newborns and its correlation with each others.

Majority of (24%) women had three and more ANC visits which was concurrent with the study carried out by Khatun MA et al (57%)^[10] (68%) mothers height was 141-145cm similarly found in Garg A et al (45.7%)^[11] (60%) of mothers weight was 51-60 kg similarly found in Mumtaz G et al (24%)^[12] (94%) women were primi which was seen in the study of Kachapati A et al (65.9%)^[13] (92%) mothers gestational age were 39-40 weeks which was concurrent with the study carried out by Berquier JB et al ^[14] (98%) of mothers placental weight was < 500g which was similar in Nayak AU et al^[15]

(98%) of newborn's APGAR score interpreted no depression concurrent with Berquier JB et al (95%)^[14] Most of newborns (44%) were of term gestation i.e. >37 weeks similar to Kachapati A et al (48.2%)^[13]

Pearson correlation coefficient between selected maternal factors and birth characteristics of newborn was $r = 0.9$ similar to Jotishi A et al correlation between maternal factors and birth weight of newborns $r = 0.8$ ^[16]

Conclusion

Selected maternal factors (antenatal, intra-natal, postnatal) have effect on birth characteristics of newborns. It was found that there was strong positive correlation between selected maternal factors and newborn characteristics hence, the future risk for complications, morbidity and mortality rate of mothers and newborns can be minimized with regular planned health checkup along with awareness regarding MCH services. Various policies must be practice by mothers to improve and maintain the health status of self and their neonates

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