

SHORT ARTICLE

Maternal and Perinatal Complications from a Hospital-based Intra-partum Complications Registry Established in Remote Referral Hospitals of a Desert District of India

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Abstract	Introduction	Methodology	Results	Conclusion	References	Citation	Tables / Figures
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Abstract

Background: Despite increase in institutional deliveries, maternal and neonatal mortality has reduced slower than expected. It is important to know the reasons of maternal and perinatal deaths for doing focused efforts for reducing them. **Objective:** The objective of this study was to establish a system to improve estimation of maternal and perinatal complications among deliveries. **Methods:** The study was designed as a descriptive study. An Intrapartum Complications Registry was set up in eleven government hospitals of Bikaner. In each facility, a "champion" nurse ensured the complete documentation in case sheets and delivery register, and entered all maternal and perinatal complications into an Intrapartum Complications Register which was digitized into a registry database. The data for a six-month period in 2014 was analysed. **Results:** Out of 3675 women admitted to the labour rooms of the study facilities, 295 women were referred out with complications before delivery, and 3380 mothers delivered 3386 new-borns (including 6 twins). The registry documented 828 cases (22.5%) (512 mothers and 363 new-borns, 47 cases having both mother and new-born complications) with 1014 complications (535 maternal and 479 perinatal complications). The commonest maternal complications were haemorrhage (47.1%), prolonged or obstructed labour (28.4%) and hypertensive disorders (15.3%). The commonest perinatal complications were low birth weight (33.6%), birth asphyxia (18.6%) and neonatal sepsis (16.2%). No maternal or neonatal deaths occurred up to the first 48 hours. **Conclusion:** Intrapartum Complications Registry improved the documentation of and revealed the profile of maternal and perinatal complications in the study area.

Keywords

Maternal; Perinatal; Complications; Intra-partum; Registry

Introduction

India is home to the highest number of maternal deaths in the world. One of the major contributors to this, is the state of Rajasthan, with a maternal mortality ratio of 244 per one lakh live births, well above the national average of 167.(1) The neonatal mortality in Rajasthan is also higher than the national average of 25 per 1000 live births.(1) There are several factors which contribute to maternal and infant mortality in this state, ranging from geographical terrain and lack of transport which limits accessibility, to social, economic, and cultural factors which result in anaemia, home deliveries and increased fertility rates, to lack of trained human resources in maternal health and neonatal health.

With the introduction of Janani Suraksha Yojana, there has been an increase of more than 75% in institutional deliveries, (2) but the quality of care has been suboptimal. (3) An important component of quality of care is quality documentation for tracking and feedback. A recent assessment of the quality of obstetric care revealed that documentation of complications during deliveries is poor.(4) The Government of India has initiated maternal death reviews to improve information about causes of maternal deaths, (5) but lack of documentation and delayed reporting has resulted in poor investigation quality.(6) Special surveys for maternal deaths require large sample size and rely on mathematical modeling.(7) Lack of data on the levels and causes of mortality and morbidity in mothers and new-borns necessitates establishing other mechanisms for formulating intervention strategies in an informed manner.(7)

As mentioned in the title page, an international development partner, in collaboration with a program run by a medical college in India and an international school of public health provided technical assistance to the Government of Rajasthan to set up an Intrapartum Complications Registry in Bikaner district, with the aim of improving accuracy of reporting of maternal and perinatal complications. An Intrapartum Complications Registry would reflect the quality of delivery practices and would accurately estimate the proportion and types of maternal and perinatal complications amongst the deliveries taking place at government health facilities. Documenting intrapartum complications, would also support the need of reorientation of staff

and initiate improvement or strengthening of standard intrapartum management practices.

Aims & Objectives

To estimate the proportion and types of maternal and perinatal complications among deliveries conducted at government referral hospitals of Bikaner district of Rajasthan

Material & Methods

The study was undertaken after obtaining ethical clearance permission from the Human Ethics Committee of IJHMR, Jaipur and the procedures followed were in accordance with the ethical standards of the committee and with the Helsinki Declaration of 1975, as revised in 2000. This article does not contain any studies with animals performed by any of the authors. A written informed consent was obtained from all individual participants included in the study. The data of registry was anonymized using safe harbour method for safeguarding privacy and confidentiality of the participants.

An Intrapartum Complications Registry was set up in all the government referral hospitals of Bikaner District. This included one tertiary care hospital and ten Community Health Centres (24x7 First Referral Units) of Bikaner District. These were located in the taluks of the district. The registry included all the complications in the mother and baby among those admitted in the labour room of these hospitals. Women who were referred out for further management of complications after admission to the labour room were included in the registry. Women who were referred out before admission to the labour room were not included in the registry. Data regarding the deliveries was entered into the patient case sheet and the delivery register, the completeness of which was checked by a facility-based "champion" (nurses who were specially trained for this purpose in each facility). Periodic messages were also sent to the mobile phones of the service providers for reminding the importance of complete documentation. Posters regarding case definitions and guidelines for management of complications, were designed for the project and displayed in the facilities. All maternal and perinatal complications were entered by the champion into the Intrapartum Complications Register, which was designed to capture not only the types of complication but also the management of each case. Supportive supervision visits were provided to each

facility once a month to improve quality of documentation.

It is possible that some complications could have arisen earlier during the course of pregnancy and while some could have arisen after the onset of labour. Regardless, the presence of any complications in the mother or the baby while in the labour room and up to 48 hours after delivery was defined as an intrapartum complication. Complications that were to be documented were maternal complications like antepartum haemorrhage, prolonged and obstructed labour, postpartum haemorrhage, sepsis, and hypertensive disorders of pregnancy like eclampsia and pre-eclampsia; and perinatal complications like foetal distress, intrauterine death, low birth weight, birth asphyxia, preterm birth, neonatal sepsis, and stillbirth.

Data from the all the Intrapartum Complications Registers were entered every month into a registry database. The data for a six-month period in 2014 was entered and analysed using SPSS v24. The socio-demographic data and complications were described by frequencies, proportions, and measures of central tendency. A p value of less than 0.05 was considered statistically significant.

Results

During the study period, 3675 women were admitted to the labour rooms in the government referral hospitals of Bikaner district. The Intrapartum Complications Registry documented a total of 828 cases (22.5%) with complications ([Figure 1](#)).

Most women who experienced complications belonged to the age group of 19 to 29 years (88.8%) and were illiterate (37.9%). Majority were Hindu by religion (91.1%). Only 5.7% of the mothers with complications had undergone 4 or more antenatal visits. Nearly one in ten mothers with complications were of preterm gestation (9.9%) ([Table 1](#)).

Among the 828 cases with intrapartum complications, a total of 1014 complications were documented. 295 of the mothers had complications, were documented in the registry, and were referred out for further management. There were 533 deliveries with intrapartum complications of whom 217 mothers had complications, and 363 new-borns had complications (in some cases, both the mother and the baby had complications).

From the registry, a total of 512 (13.9%) mothers had documented intrapartum complications (295

referred out and 217 who delivered in the health facility). A total of 535 various maternal complications were reported among these 512 mothers. 3386 babies were born from 3380 deliveries (there were 6 twin deliveries). Out of 3386 new-borns, 363 (10.7%) new-borns had 479 perinatal complications. There were no maternal or neonatal deaths recorded up to the first 48 hours in the intrapartum registry.

The most common maternal complications were haemorrhage (47.1%), which included postpartum haemorrhage (33.1%) and antepartum haemorrhage (14.0%), prolonged or obstructed labour (28.4%), hypertensive disorders (15.3%), including 7.3% pre-eclampsia and 14% antepartum haemorrhage ([Table 2](#)). Of all the documented perinatal complications, 33.6% were low birth weight, of which two-thirds were full term low birth weight. Other common perinatal complications were birth asphyxia (18.6%) and neonatal sepsis (16.2%). Congenital anomalies included hydrocephalus, anencephaly, congenital ano-rectal malformation, imperforate anus, congenital talipes equino varus. The "other" complications included excessive crying, bloody stools, convulsions, and vomiting ([Table 3](#))

Discussion

The hospital-based intra-partum complications registry established in Bikaner District of Rajasthan, India has revealed the profile of maternal and perinatal complications experienced by women and babies in this area. 22.5% of the deliveries were complicated (with complication either in the mother or baby), 13.9% of mothers and 10.7% of the new-borns had complications. The most common maternal complications were haemorrhage (47.1%), prolonged or obstructed labour (28.4%) and hypertensive disorders (15.3%). Of all the documented perinatal complications, the commonest were low birth weight (33.6%), birth asphyxia (18.6%) and neonatal sepsis (16.2%).

The high proportion of haemorrhage among maternal complications is a probable result of anaemia. As per NFHS-4 data, nearly 47% of all pregnant women in Rajasthan are anemic. (8) In 2010, maternal mortality was 178 per 100,000 live births, (9) and the commonest causes of maternal mortality were haemorrhage (35%), hypertensive disorders in pregnancy (18%), unsafe abortion (9%), sepsis (8%). In 2016, maternal mortality has reduced to 130 per 100,000 live births,(10) however the

proportion and causes of maternal mortality remain largely unchanged - haemorrhage (27%), hypertensive disorders in pregnancy (14%), unsafe abortion (8%), sepsis (11%).(7) The commonest causes of neonatal mortality currently are preterm (35%), intrapartum asphyxia (23%), sepsis (13%) and congenital anomalies (9%).

It is interesting to note that the commonest maternal and perinatal complications from the intrapartum registry at Bikaner district are similarly aligned with the causes of maternal and neonatal mortality in India. This points to evidence that the detection and management of intrapartum complications can lead to reduction in maternal and neonatal mortality.

As neonatal mortality seems to be clustering more and more around the time of birth, documenting the complications in the new-born into an intrapartum registry also assumes greater significance. (11)

With 84% of all deliveries occurring in hospitals in Rajasthan, (8) there is great scope of reducing maternal and neonatal mortality, by targeting the common complications that have been documented in the registry.

Conclusion

Intrapartum Complications Registry improved the documentation of and revealed the profile of maternal and perinatal complications in the study area.

Recommendation

The public health implications of the present study indicate that a hospital-based intra-partum complications registry can provide valuable regional-specific information about the pattern and profile of maternal and perinatal complications. This information can be used to focus efforts on designing targeted interventions and health education packages at various levels of health care, for those complications most incident in the region. Capacity building across various cadres of health care personnel is important especially for those involved in the management of labour, for the diagnoses and effective management of maternal and perinatal complications, which will prevent maternal and neonatal mortality, and will improve the quality of care.

Relevance of the study

The study demonstrates an innovative way of gathering information and utilizing it for the benefit of the mothers and new-borns.

Authors Contribution

GM: Conceptualization, Design, Literature Search, Data Acquisition, Data Analysis, Statistical Analysis, Manuscript Preparation, Guarantor; BSM: Conceptualization, Design, Intellectual Content Definition, Data Analysis, Statistical Analysis, Manuscript Editing, Manuscript Review; JAR: Literature Search, Data Analysis, Statistical Analysis, Manuscript Preparation; GG: Intellectual Content Definition, Data Acquisition.

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Tables

TABLE 1 CHARACTERISTICS OF THE WOMEN WHO EXPERIENCED INTRAPARTUM COMPLICATIONS

Demographic Characteristics	N=828 N (%)	Obstetric Characteristics	N=828 N (%)
Age of Mother (in years)		No. of pregnancies	
≤ 18	8 (0.9)	Primigravida	363 (43.8)
19 – 29	735 (88.8)	Multigravida	381 (46.0)
≥ 30	70 (8.5)	Grand-multigravida	51 (6.2)
Not recorded	15 (1.8)	Not recorded	33 (4.0)
Education of Mother		Antenatal check-ups	
Illiterate	314 (37.9)	Antenatal check-ups ≥4	47 (5.7)
Primary	178 (21.5)	Antenatal check-ups ≤ 3	577 (69.7)
Secondary	135 (16.3)	Not recorded	204 (24.6)
Graduate	16 (1.9)	Term	
Post graduate	4 (0.5)	Full term	712 (86.0)
Not recorded	181 (21.9)	Preterm	82 (9.9)
Religion		Post-dated	6 (0.7)
Hindu	754 (91.1)	Not recorded	28 (3.4)
Muslim	71 (8.6)		
Christian	0 (0)		
Other	3 (0.3)		

TABLE 2 PROPORTION OF VARIOUS MATERNAL COMPLICATIONS

N=535	N (%)
Haemorrhage	252 (47.1)
Antepartum haemorrhage	75 (14.0)
Postpartum haemorrhage	177 (33.1)
Prolonged or Obstructed Labour	152 (28.4)
Hypertension in Pregnancy	82 (15.3)
Pregnancy induced hypertension	16 (3.0)
Pre-Eclampsia	39 (7.3)
Eclampsia	5 (0.9)
Unclassified Hypertension	22 (4.11)
Pre-Labour Rupture of membranes	31 (5.8)
PROM 1	24 (4.5)
Prolonged ROM 2	5 (0.9)
PPROM 3	2 (0.4)
Retained placenta	7 (1.3)
Polyhydramnios	5 (0.9)
Sepsis	3 (0.6)
Perineal hematoma	2 (0.4)
Chorio-amnionitis	1 (0.2)

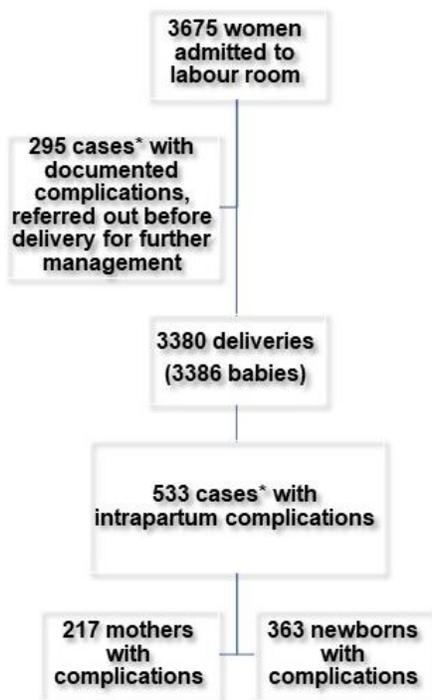
1. Premature rupture of membranes (before onset of labour) 2. Prolonged rupture of membranes (more than 24 hours before onset of labour) 3. Preterm premature rupture of membranes (before 37 completed weeks of gestation)

TABLE 3 FREQUENCY OF PERINATAL COMPLICATIONS

N=479	N (%)
Low Birth Weight	161 (33.6)
Preterm Low birth weight	50 (10.4)
Full term Low birth weight	111 (23.2)
Preterm Babies	51 (10.6)
Birth Asphyxia	89 (18.6)
Neonatal sepsis	78 (16.2)
Fetal distress	41 (8.6)
Jaundice within 24 hours	14 (2.9)
Respiratory distress	8 (1.7)
Intra-uterine death	7 (1.5)
Congenital anomalies	7 (1.5)
Twins	6 (1.3)
Intrauterine growth retardation	5 (1.1)
Meconium aspiration	3 (0.6)
Stillbirth	1 (0.2)
Other	8 (1.7)

Figures

FIGURE 1 FLOW DIAGRAM OF ENROLLED CASES IN THE STUDY



*documented in the intrapartum complications' registry