

## Perinatal care - dimensions and approaches to improve quality of care in developing countries

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### Abstract

**Background:** Despite significant progress in reduction in neonatal mortality, perinatal mortality in India is relatively stagnant. There is also mismatch between quantitative gain in the institutional delivery and reduction in maternal and perinatal mortality. Quality of care has emerged as a critical determinant of facility level care for perinatal, neonatal and maternal outcomes. This systematic review attempted at improving the understanding on the determinants, influencers and potential interventions that improve these health outcomes.

**Materials & Methods:** A PubMed database search was done using MeSH terms including quality of care, perinatal care, India, hospital, intrapartum care, implementation & still birth for period 2006 to 2016. A narrative synthesis of the objectives and results was done.

**Results:** Out of the 3715 articles, 19 articles were found suitable for review. The findings were synthesized under four broad domains and 14 sub-domains. Majority of the patients attending public health facilities were unaware of the standards of services with minimal expectation, thus perceived whatever available as good. The infrastructural, staff availability, attitude and behavior were factors for low client satisfaction. Off-hours and weekend deliveries had higher adverse perinatal outcome. Deliveries at busy hospitals and higher institutional delivery didn't proportionately reduce perinatal mortality. Sub-optimal antenatal care, obstructed labour, delayed care seeking and referral were risk factors for perinatal outcome. Perinatal death audit, capacity building and checklists have positive impact on outcomes.

**Conclusions:** Although the broad risk factors and determinants of perinatal outcome are known, appropriate context specific adaptation of intervention is needed for improving the perinatal survival.

**Keywords:** Skill building, Newborn, Pregnancy, Postnatal care.

### Introduction

India failed to achieve the Millennium Development Goals (MDGs) target for infant mortality rate (IMR) and maternal mortality ratio (MMR). The new targets set under Sustainable Development Goals (SDGs) aim at IMR of 12 per 1000 live births by 2030.<sup>(1)</sup> In 2011, 309300 babies in India and over one million babies (1049300) globally lost lives before 1<sup>st</sup> birthday.<sup>(2)</sup> The estimated first day mortality rate is 11 for Indian infants compared to 8 per 1000 live births globally.<sup>(3)</sup> Cumulative IMR for India has fallen by half, from 74 to 37 per 1000 livebirths between in 1994 and 2015.<sup>(4)</sup> The decline in perinatal mortality rate (PMR) and stillbirth rate are slower compared to IMR; 34% (42.4 to 28 per 1000 livebirths) and 42% (8.7 to 5 per 1000 livebirths) respectively between 1998 and 2012.<sup>(4)</sup> Perinatal health care is one of the most concentrated arena, which if targeted well, holds the capacity to achieve the SDGs. The perinatal period starts with completion of 22<sup>nd</sup> week of pregnancy and ends on completion of seven days after birth. The perinatal mortality combines the stillbirths and early neonatal mortality (deaths in the first week of life).<sup>(14)</sup> Thus improving the peripartum care, over 1.9 million lives can be saved by 2025, including the neonatal deaths, stillbirths and maternal deaths<sup>(13)</sup>. Newborn survival and prevention of stillbirths were submerged within the MDG4 and consequently received less attention and

investments.<sup>(11)</sup> In 2015 countdown for India, Intrapartum SBR was 12.5 (per 1000 total birth), Intrapartum stillbirth and neonatal deaths on day of birth was 23.20 (per 1000 total birth) and Neonatal mortality rate (NMR) was 30.9 (per 1000 live birth). Total number of death during birth & first day was 598,038, number of deaths on the day of birth were 275,800 and the number of intrapartum stillbirth were 275,800.<sup>(5)</sup> It was estimated that in 2012, 2.6 million stillbirths occurred worldwide and 45% of these (approximately 1.2 million) occurred during labor.<sup>(9)</sup> The burden of these 'intrapartum stillbirths' is much higher in low-income countries<sup>(10)</sup> Around 24% of neonatal deaths occur due to intrapartum complications.<sup>(8)</sup> about 44% of stillbirths, 73% of neonatal deaths and 61% of maternal deaths occur in the perinatal period.<sup>(12)</sup> Globally, 1 in 190 mothers is at lifetime risk of maternal death.<sup>(7)</sup> India ranked 140 in the annual Mother's Index for year 2015.<sup>(7)</sup> There has been significant increase in the institutional delivery in India under the Janani Suraksha Yojana of National Rural Health Mission (NRHM).<sup>(5)</sup> But the impact on reduction of maternal mortality, neonatal mortality and perinatal mortality is sub-optimal<sup>(5,6)</sup> It is estimated that by improving perinatal care, about 1.9 million lives (including the newborn deaths, maternal deaths and stillbirths) can be saved by 2025.<sup>(7,8)</sup> This mismatch between quantitative gain and improvement in survival

indices point towards gap in the quality of care at the facilities. Globally quality of care has emerged as an important parameter for assessing the impact of the service delivery. We tried to highlight the issues of major concern in achieving the targets by this systematic review. This article focuses on the an approach for quality of care in Perinatal period with objectives to identify the prevalent perinatal care practices and issues in quality care and to assess impact of improvement in quality of care.

## Methodology

**Search Strategy:** A search was performed using PubMed as a database to identify articles exploring the outcomes for perinatal care, healthcare perspectives and implementations for betterment of Perinatal care. The search strategy included various combinations of MeSH terms and the keywords using the terms quality of care, perinatal care, India, hospital, intrapartum care, implementation & still birth. Indian government reports were searched for relevant statistical data. The search was limited to English language publications from 2006 to December 2016. The framework and process of selection of the articles is shown in Fig. 1.

**Narrative synthesis:** After reviewing the literature, we performed narrative synthesis of the articles. Different findings of the studies were compared and analyzed for interpretation for different domains.

## Results

**Search Results:** After a thorough search and screening, 19 articles were found suitable for review. The articles reported findings from both developed and developing countries. Few reviews were also included in view of the findings were significant to the objective.

**Review findings:** After reviewing articles, four broad domains and 14 sub-domains were identified for summarization of the findings. The domains and subdomains with the number of articles are presented in Table 1. Findings are presented in context of these different domains in order to synthesize a meaningful outcome from the review point.

**Table 1: Distribution of articles according to the domains**

S. No.	Domains	No of articles
<b>1</b>	<b>Perceptions of various actors on care provision</b>	
1.1	Patients	2
1.2	Staffs	1
<b>2</b>	<b>Factors influencing perinatal outcomes</b>	
2.1	Time of delivery	2
2.2	Human resource and case load in facilities	2
2.3	Institutional delivery	1
2.4	Capacity building	2
2.5	Risk factors	3
<b>3.</b>	<b>Scenario based evaluation</b>	
3.1	Identification of high risk pregnancy	1
3.2	Identifying of potentially preventable deaths	1
3.3	Perinatal audits	1
<b>4</b>	<b>Rationale behind endorsing quality</b>	
4.1	Impact on service safety	1
4.2	Need in Perinatal care	1
4.3	Introduction of an indicator	1
<b>5</b>	<b>Definite approaches to quality care</b>	3

1. Perceptions of various actors on care provision: Perception and understanding of 'seeking care' is an important aspect of 'quality care'. Views of patients and staff members are important and essential for any improvisation in service delivery to match their needs. It was observed that women with normal delivery, low level of education, past experience of general hospital had better overall satisfaction level for the care received. It was observed that women were ill informed about the expected level of quality of care and thus perceived whatever received to be good.<sup>(9)</sup> The dissatisfaction could be covered under few areas: a) Infrastructure (out of date equipment and hospital inventory, hygiene and sanitation of the wards), b) availability of service provider (insufficient availability, number and duration of contact), c) service provider's attitude and behavior.<sup>(9,10)</sup> Respondents opined that process of quality improvement in safety and quality of service provision should not involve punitive action on staffs. The senior staffs had better understanding about the governance framework and quality framework compared to the junior staffs.<sup>(11)</sup>
2. Factors influencing perinatal outcome: Studies have focused on one or combination of factors and their effect on perinatal outcomes.
  - 2.1. Timing of delivery: Variation in perinatal outcomes for deliveries during weekdays and weekends have been observed. Higher occurrence of puerperal infection, perineal tear, birth injuries, neonatal infections and perinatal mortality were observed among deliveries during weekends compared to weekdays.<sup>(12)</sup> Similarly off-hours (evening and night time) deliveries with induction, augmentation of labor or cesarean section had higher perinatal adverse outcomes compared to daytime deliveries. But such difference was not observed for normal deliveries.<sup>(13)</sup>
  - 2.2. Availability of staff and caseload: A study did not observe any impact of staffing on perinatal outcomes. Whereas, at facilities with high caseload many potentially harmful practices such as routine augmentation of labor, episiotomy for primigravida, fundal pressure and routine suction of newborns were observed. These practices were adopted to reduce the delivery time.<sup>(14)</sup>
  - 2.3. Institutional delivery: It is assumed that institutional deliveries would improve perinatal outcomes. Observation from India also didn't demonstrate proportionate impact on maternal and perinatal mortality.<sup>(5,6)</sup> But to a dismay, at few places, the perinatal mortality increased with increase in institutional delivery.<sup>(5)</sup>
  - 2.4. Capacity building: Interventional studies have documented improvement in health outcomes by training of health care providers. Although beneficial practices increased over harmful

- practices, some practices continued due to apparent rigidity of health officials.<sup>(14,15,16)</sup> Moreover, team training improved team performance and quality of care from patient's perspective.<sup>(15)</sup>
- 2.5. Risk factors: Lack of antenatal care, delay in seeking care during labor, obstructed labor were key risk factors for intrapartum mortality emerged as a key risk factor with strong association with antepartum stillbirths.<sup>(17,18)</sup> Additional some avoidable factors including referral transport facility, health worker support and administrative causes at facility level also were observed as risk factors.<sup>(19)</sup>
  3. Scenario based evaluation: There have been efforts for improving the quality of care and evaluation.
    - 3.1. Identification of high risk pregnancy: Antenatal care has been documented as a risk factor for perinatal outcome. Screening for high risk during antenatal checkups found to have a direct impact on stillbirth.<sup>(20)</sup> Doppler monitoring for fetal movement and amniotic fluid assessment in oligohydramnios cases were helpful in reducing perinatal mortality.<sup>(21)</sup> Fetal monitoring like cardiotocography seemed helpful in declining stillbirth incidence in high income countries.<sup>(20)</sup> Similar evidences from developing countries are not available.
    - 3.2. Identification of potentially preventable deaths: Majority of perinatal deaths are stillbirths and are primarily due to asphyxia.<sup>(22,23)</sup> Major causes of perinatal death were unexplained asphyxia, unexplained stillbirth, obstetric complications like obstructed labor and maternal diseases.<sup>(23)</sup>
    - 3.3. Perinatal audit: Perinatal death audit identified poor monitoring during early labor as key predictor of stillbirth, birth asphyxia and perinatal death.<sup>(20,22)</sup> The audit revealed stillbirth to be a major chunk in perinatal deaths and common in preterm newborns and young mothers. Maternal factors such as eclampsia, pre-eclampsia and anemia also led to perinatal deaths. Large proportion of newborn deaths in first 24 hours after delivery emphasized need for improving perinatal care.<sup>(22)</sup>
  4. Meeting quality demand: As is striking through the review that quality holds a major concern to add in the care provision, a few studies included the key measures to quality.
    - 4.1. Teamwork and accountability: Team dynamics, trust and mutual respect among health staffs were identified as key potential elements to further the service improvement. Particularly the nurses and midwives were the key actors to influence the quality in care provision in almost all settings.<sup>(11)</sup>
    - 4.2. Capacity building and meeting the void: Availability of the midwives at facility and administrative workload for the doctors and specialists were identified as challenges for service delivery. On enquiry about the danger signs, most of the midwives could recall eclampsia as the only danger sign. The other danger signs like obstructed labor, sepsis were not mentioned.<sup>(23)</sup> Availability or midwives and doctors for clinical services and knowledge and competency of the available staffs need upgrading for desired service delivery with quality.<sup>(24)</sup>
    - 4.3. Choosing suitable interventions: While induction of labor and cesarean section in suitable cases could reduce stillbirths, use of magnesium sulfate was helpful in controlling eclampsia, but didn't reduce perinatal death. Transcervical amnioinfusion for meconium staining was found useful in some settings, but the impact on perinatal deaths was not well documented.<sup>(25)</sup> Training of doctors and managers reduced routine augmentation of labor, episiotomy, fundal pressure application and routine suction of newborn, although some other practices didn't change. Protocol adherence improved with use of checklist at the facilities. Checklist use also could identify the knowledge and skill gaps.<sup>(14)</sup> Capacity building of physicians in neonatal resuscitation and community health workers in antenatal and perinatal care coupled with health system strengthening were beneficial. Some innovative strategies like financial incentives, insurance schemes and concept of maternity homes were highlighted to reduce stillbirths.<sup>(26)</sup>

## Discussion

Review of the studies highlight the basic needs of perinatal care and importance of quality in service. Stillbirth constituted a major proportion of perinatal deaths and is dependent on the pregnancy and perinatal care. Maternal care including antenatal care, especially during the third trimester should be optimal. Monitoring the pregnancy using amniotic fluid assessment and basic urine or blood tests influence outcome, but competency of health staff is important. Obstructed labor is a key maternal risk factor for perinatal death, but identification and appropriate action requires skill. So antenatal care again holds a reason to be strengthened. Use of checklists are useful in improving protocol adherence and also identifying the knowledge and skill gaps responsible for poor quality care. Ensuring staff availability round the clock, especially availability of competent care provider during the off hours of weekends is essential. Optimal staff availability for the caseload is essential to prevent and reduce the harmful and unnecessary practices. Only increasing number of institutional deliveries are unlikely to reduce the maternal, perinatal deaths and stillbirths without improving the quality of care. The perception of quality of services varies according to the patient characteristics like education and past experience of hospital care indicating the expectation

levels by clients. The mode of delivery and outcome were also important factors for satisfaction level. It was also observed that majority of the beneficiaries were unaware of the standard of services and had almost null expectation, thus perceived whatever was available as good.

Studies have adopted various modalities to address the risk factors, barriers and processes to improve the pregnancy and perinatal service delivery at facilities. The interventions included, skill targeted capacity building, team training at facility level and use of checklists. The benefit of community health worker capacity building on pregnancy, high risk case identification and care seeking have also been documented. Several of the capacity building efforts included the different levels of workers separately. There is need for linking the workers at different levels and complementary capacity building to ensure continuity of care and skill complementation.

The impact of training multiple types of staffs and functionaries together is expected to be different and not documented yet. The key dissatisfaction expressed by the patients include poor hygiene and sanitation in the wards and toilets. To ensure this there is need for engagement of the hospital staffs responsible for support services and inform them about relevance of their work in the quality of care arena. There is also need for basic infrastructural upgradation with provision of facilities to enable comfortable stay of the pregnant or recently delivered women and their newborns during the postpartum period.

### Implications

This review highlighted the overall care during pregnancy and delivery are important for a good perinatal outcome. A good perinatal outcome stands for a healthy newborn and healthy mother with a satisfied mother and family. Not only health outcomes, but the client satisfaction is also essential for ensuring mothers and beneficiaries returning to the public health facilities to sustain the institutional delivery level. For ensuring quality antenatal care and high risk case identification by community health workers and midwives and at the facility level, capacity building and regular monitoring is essential. Apart from doing basic tests and giving basic medicines, a good birth preparedness and counseling is critical. Secondly, identification of high risk pregnancy at community and facility level should be emphasized. Midwives must identify the high risk pregnancies and intrapartum complications for triaging and emergency management of the intrauterine hypoxia. Fetal wellbeing monitoring using Doppler and electronic devices like cardiotocograph can assist the treating team in this context. Additionally, maternal waiting homes can assist the pregnant women from distant and difficult terrains with transportation challenges to be present near health facility before the labor. This can not only be convenient for them, but can also improve the perinatal outcomes. Use of clinical

practice and process checklists can assist protocol adherence. Motivation and accountability of the health care providers can be improved with clear role delegation and financial or non-financial incentives. Appropriate motivation and capacity building of the hospital support staffs can assist in improving the infrastructural and basic facilities to improve the client stay experience. Family members of the patients should be actively involved in counseling and birth companion presence during delivery process can improve the understanding and experience. At the end, there should be strong policy for preventing early childhood marriages and women education to support the health interventions. A long path is to be travelled to achieve the unfinished MDGs and renewed goals under SDGs in the developing and resource constrained communities and countries.

### Acknowledgements

We acknowledge the support of Mr Deepak Kumar Singh, Library and Documentation Officer at The INCLEN Trust International for supporting in retrieval of the articles for review.

### Declarations

Funding: None

Conflict of interest: None

Ethical approval: Not applicable, as there was no primary data collection or use of any primary or secondary data.

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