# Reduction of Perinatal Mortality Rate in Tata Main Hospital : A Quality Improvement Project

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**Summary**

**The changing concepts in the health care delivery system have caused the patient to be viewed as a customer and medical profession as a healthcare service, bringing to the forefront the concept of Quality Improvement. One of the most important "Key Quality Indicators" of an efficient obstetric unit is its Perinatal Mortality (PNM). A study was undertaken to reduce the PNM in Tata Main Hospital through a quality improvement project.**

**An analysis over a period of one year revealed that 4.5% cases of stillbirths were preventable while majority came late with absent foetal heart. Sepsis, birth asphyxia and meconium aspiration syndrome emerged as the main causes of early neo-natal death . On further analysis, preventable root causes were lack of On-The Job Training comprising of baby's handling and resuscitation and Improper Protocol for high risk pregnancy identification.**

**On instituting these remedial measures PNMR came down from 40.5 to 30.8 per 1000 deliveries.**

## Introduction

Perinatal mortality is one of the most important parameters of an efficient obstetric unit and mirrors the service provided by it. A low perinatal mortality rate (PNMR) enhances the hospital image. This depends mainly on good antenatal check-up, early pickup of high risk cases and intensive monitoring during labour. To achieve this a Quality Improvement Project (QIP) was taken up in Tata Main Hospital.

## Material and Method

**1.Study Organisation:** Tata Main Hospital, Jamshedpur is a 835 bed industrial hospital catering mainly to the employees of Tata Steel and their families. It also acts as a referral hospital for the population in and around Jamshedpur. Annual deliveries are about 6500 of which 60% are unbooked.
**2.Method:** A QIP addresses a problem that is chronic, feasible, significant and measurable. It is usually a problem for which a solution has to be found often in a cross functional area. We followed the "Breakthrough Sequence" which is an organized creation of "beneficial change" and proceeded in steps.

### Step 1: Proof of the need

We collected data of PNMR from different industrial hospitals and found a higher PNMR in Tata Main Hospital as compared to other industrial hospitals (Fig 1). So it was felt that this project must be taken up. This project is also linked to the objective of Quality Sub-council of Medical Division of Tata Steel. It aims to provide comprehensive healthcare services, with prompt and expert care, to our patients through continuous improvements in systems and procedures. The Quality Indicator in this study is PNMR, which was 40.5 per 1000 deliveries. A target of 35 per 1000 deliveries was aimed. A team comprising of obstetricians and paediatricians was formed and they met at regular intervals for assigned activity.

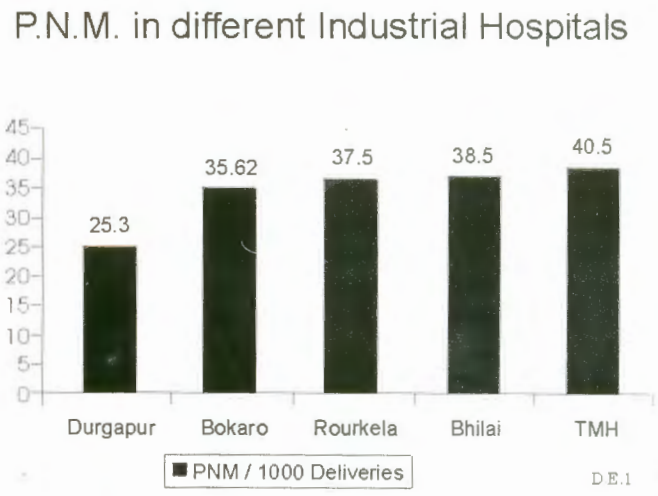


Fig 1

### Step 2: Diagnostic Journey

An Initial Process Flowchart (Fig 2) of all steps right

from patient's visit to Antenatal Clinic till their delivery and discharge was made. This was followed by Detailed Process Flowchart comprising three major critical activities. The stages where certain measures could be taken were also identified.

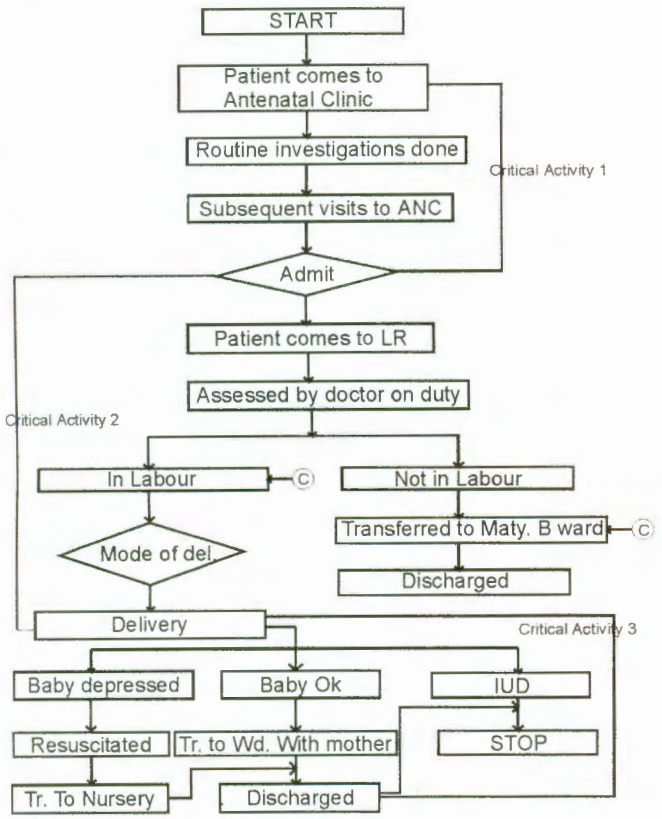


Fig. 2

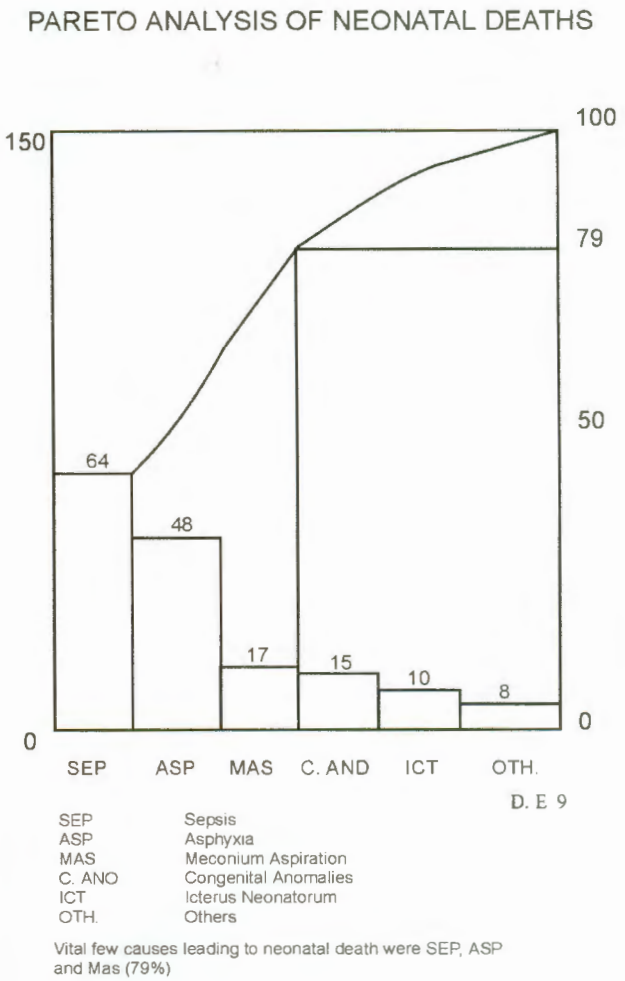


Fig. 3

Further data was collected and stillbirths, for one year, and early neo-natal deaths were analysed. Few vital causes leading to neo-natal deaths were detected by Pareto Analysis (Fig. 3). Brainstorming, in the department identified the causes of perinatal mortality. A Cause-Effect diagram (Fig. 4) was made to group the different causes. Root-Cause Analysis (Table I) was done on the basis of data collected which were

- Lack of on-the-job training
- Lack of adequate antenatal check-up & education
- Inadequate availability of manpower.

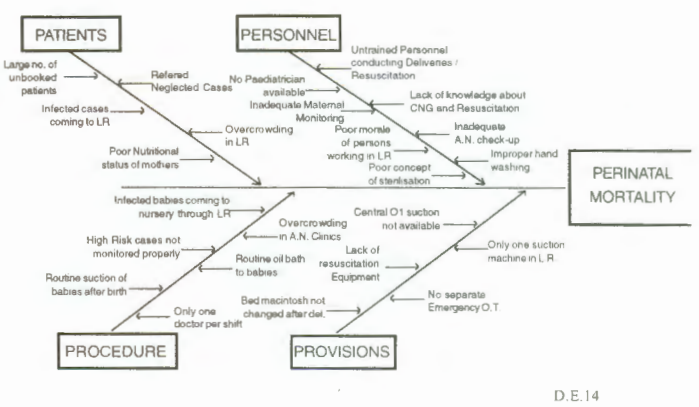


Fig. 4

**Table I**
**Root cause Analysis**

| | | |
|---|---|---|
| **Patient Related** | | |
| 1. Overcrowding in LR | Why? | No other Maternity Hospital. |
| 2. Large no. of unbooked patients | Why? | Lack of Adequate Check-up* |
| 3. Infected cases coming to LR | Why? | -do- |
| 4. Referred neglected cases | Why? | -do- |
| 5. Poor nutritional status | Why? | -do- |
| **Personnel Related** | | |
| 1. Inadequate AN Checkup | Why? | Lack of on the job training* |
| 2. Inadequate maternal monitoring | Why? | -do- |
| 3. Poor knowledge of resuscitation | Why? | -do- |
| 4. Improper hand washing | Why? | -do- |
| 5. Poor concept of sterilization | Why? | -do- |
| 6. Lack of CTG knowledge | Why? | -do- |
| 7. No paediatrician available | Why? | Inadequate availability of manpower* |
| **Procedure Related** | | |
| 1. Routine oil baths to babies | Why? | Poor awareness & lack of on the job training. |
| 2. Routine suction of babies | Why? | -do- |
| 3. High risk cases not monitored properly | Why? | -do- |
| 4. No surveillance for infection in LR | Why? | -do- |
| 5. Only one doctor in one shift | Why? | Inadequate availability of man power. |
| 6. Infected babies coming to nursery through LR | Why? | Procedural defect. |
| **Provision Related** | | |
| 1. Central oxygen & suction not available | Why? | High Cost. |
| 2. No separate emergency O.T. | Why? | -do- |
| 3. Lack of resuscitation equipment | Why? | Poor awareness % lack of on the job training |
| 4. Only one suction machine in L.R. | Why? | -do- |

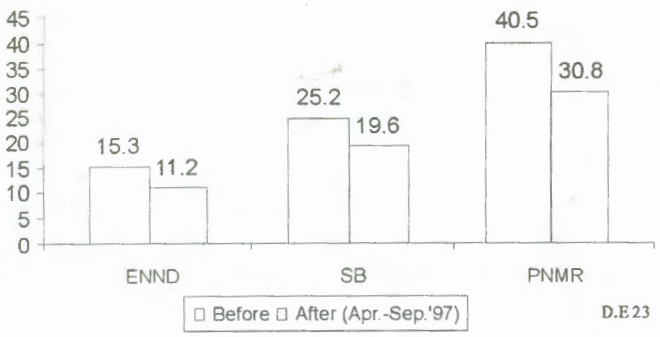


Fig. 5

**Step 3: Remedial Journey**

Remedial actions on established root causes were implemented for 6 months. These included —

a) Adopting protocols for antenatal checkups, management of high-risk pregnancies, intrapartum monitoring and improved methods of baby-handling to prevent neo-natal sepsis.
b) All doctors and nursing staff, posted in labour room, were trained in neo-natal resuscitation. Irreversibility of the results were ensured by regular training programs.

**Step 4: Holding the Gains**

The Quality Improvement Project was

implemented in 2 years. After the remedial actions were taken, a consistent reduction in perinatal mortality was seen. The benefits of improvement in systems and procedures persisted even after the completion of the project.

**Observation**

PNMR in our hospital was 40.5/1000 deliveries which was higher than that in other industrial hospitals, though our total number of deliveries were also far in excess. Our PNMR was comparable to different teaching hospitals in India. On analysis of still births, for a year, which was 25.2/1000 deliveries, it was seen that majority of women came with absent foetal heartbeat. Out of these 4.5% cases were preventable. Most of IUD which occurred in so-called booked patients had only 1 or 2 antenatal visits.

On analysis of early neo-natal deaths, i.e. 15.3/ 1000 deliveries, vital few causes were septicaemia, birth asphyxia and meconium aspiration comprising 79% of all early neonatal deaths.

After the remedial actions were taken, the collected data (Apr-Sept.'97) showed (Fig. 5) —

a) still births came down from 25.2 to 19.6 per 1000 del.
b) ENND was reduced from 15.3 to 11.2 per 1000 del.
c) PNMR was reduced from 40.5 to 30.8 per 1000 del. (24% Reduction!!)

**Discussion**

Perinatal mortality rate (PNMR) is one of the most important index which reflects the quality of services provided by an institution.

PNMR at Vellore was 40.7 and at AIIMS was 87 per 1000 del. While PNMR at different industrial hospitals was between 25.3 to 38.5 per 1000 del. PNMR reported by WHO (1989) in developing countries, was 35 to 60 per 1000 del. and mean PNMR reported by FOGSI was 66.3 per 1000 del. PNMR at Tata Main Hospital was 40.5 per 1000 del. which is higher than that in different industrial hospitals.

Sokol et al (1980) and Clarke et al (1993) have shown that perinatal outcome improved by enhanced antenatal care. Hall et al (1980) suggested that most pregnant women required only 5 full antenatal checks with more frequent measurements of blood pressure in third trimester in primigravidae. Keeping this in mind, we organized our antenatal checks by involving doctors posted in peripheral dispensaries. A protocol was formed for antenatal visits and identification of high-risk pregnancies, taking into account, the resources available to us and the doctors were trained accordingly. Our study of late foetal deaths showed that 92% of still births had already occurred before reaching the hospital. As Tata Main Hospital is a referral hospital, receiving both booked and unbooked emergency cases, the majority of still births could not have been prevented, but the booked cases were taken care of by the Screening Protocol.

The first CESDI report 1993 (Neale, 1996) showed that in 63% cases-either there was failure to act appropriately or failure to recognize problems. Our study revealed that 4 to 6% of intrapartum deaths could have been prevented by stricter intrapartum monitoring and timely decisions. One of the "root causes" of perinatal mortality, in this study, emerged as "Lack of On-the-Job Training". Therefore, training programmes were conducted for intrapartum surveillance with special emphasis on cardiotocographs interpretation. To prevent post partum asphyxia, nursing staff attending to the deliveries were also trained in neonatal resuscitation by Paediatricians.

In our study, the ENND, due to sepsis comprised 64%. Pradeep et al (1995) encountered 16% ENND due to infection. Infection was an important cause of ENND in other Indian studies as well. We instituted simple measures to ensure asepsis while conducting deliveries and handling the neonates.

By analysing the causes of Perinatal Mortality and implementing certain simple remedial measures, we were able to reduce PNMR from 40.5 per 1000 del. to 30.8 per 1000 del.

Healthcare organizations are under great pressure today to improve the quality of their services. To meet the ever rising demands of the knowledgeable consumers, it is essential to adopt the concept of Continuous Quality Improvement (Juran, 1986) in healthcare services. This need not incur additional costs and can be done with the available resources by

proper analysis and reorganization of existing systems.

Since Perinatal Mortality is the most sensitive quality index of maternal and child health services, the lowering of the PNM from 40.5 to 30.8 per 1000 del. clearly goes to show that we have achieved our quality objective.

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