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# Evaluation of Newborn Care Corners in 24 by 7 PHCs of Bhavnagar District, Gujarat

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## ABSTRACT

**Background:** As per Facility Based Newborn Care guidelines, Newborn Care Corner (NBCC) is mandatory at all delivery points which provide immediate care to newborns including initial care to sick newborns. To provide quality newborn care there is need for evaluation of facility-based interventions.

**Methods:** A cross-sectional study was conducted in all (eleven) 24X7 PHCs of Bhavnagar district during June 2014 - November 2014. Evaluation of NBCCs at PHCs was carried out using Donabedian Model having three parts. Input included facility level assessment, Process included quality care given to 33 newborns (either observing deliveries or interviewing mothers) and Output included mortality and morbidity data review.

**Results:** All PHCs had NBCC however only 27.3% had beds for newborn care. FBNC services required at NBCC were available in all PHCs except referral facilities by own vehicle (available in 36.4% PHCs). Most of PHCs were having MBBS doctors (81.8%) while AYUSH MOs were found in 63.6% PHCs. Very few PHCs (27.3%) had staff nurse. Most of equipments required for newborn care were available and functional in majority PHCs except few monitoring and resuscitation equipments. All drugs, vaccines, logistics were available at all PHCs. Delivery and newborn register were available and maintained at all PHCs. Only 45.5% PHCs were having death register. All newborns were given essential care services except eye care. Mortality record was nil and morbidity record included only Low birth weight. (Previous month data)

**Conclusion:** Existing gaps in services, staffs, equipments, maintenance of registers and records should be looked for optimum functioning of NBCC.

**Key Words:** Evaluation, Newborn Care Corner, 24X7 PHCs

## INTRODUCTION

Neonatal mortality contributes about two-third of all infant deaths (IMR 41/ 1000 live births) and half of all death in children younger than 5 years of age (U5MR rate 53/1000 live births). [1] Three-fourths of all neonatal deaths occur in first week of life. First 24 hours account for more than one-third (36.9 %) of deaths that occur in neonatal period. [2]

Major causes of neonatal deaths are respiratory distress, asphyxia, hypothermia and infections which can be easily prevented by Essential Newborn Care (ENBC). [1, 3] Government of India has put substantial resources for child survival through various national programs such MCH Programme, Immunization, ORS for Control of Diarrheal diseases, Anaemia and Vitamin A Prophylaxis Programme, CSSM, RCH I and II Programme, JSSK, IMNCI, Home Based Newborn Care, Facility Based Newborn Care (FBNC). [4, 5]

FBNC includes essential care at birth and care of sick babies in different facilities along with appropriate linkage and coordination by skilled personnel at health facilities round-the-clock. UNICEF India played lead role in partnership with state governments in early operationalization of FBNC in the country. The operational guidelines were formulated to provide details of designing special newborn care units (SNCUs) at district level, newborn stabilization units (NBSUs) at first referral units, and newborn care corners (NBCCs) at all active delivery points in district. [6, 7] There were 712 SNCUs, 2321 NBSUs and 18,323 NBCCs in the country and 40 SNCUs, 150 NBSUs and 910 NBCCs in Gujarat till 2017. [8]

NBCC is space within delivery room where immediate care is provided to all newborns. Medical officer (MO) and staff nurse trained in Navjat Shishu Suraksha Karyakram (NSSK) should be available at NBCC. Services should be available at every functional NBCC includes resuscitation including provision of warmth, early initiation of breastfeeding, weighing newborn, and initial care to sick newborns, prompt referrals well as immunization. [6]

In spite of Government's consistent efforts, neonatal mortality is still high because simple yet effective interventions do not reach to those who need them the most. However community-based research is receiving attention and investment, rigorous evaluation on facility-based interventions is lagging behind.[9] Hence present study is an attempt to evaluate NBCCs functioning at 24X7 PHCs of Bhavnagar district in terms of facility level assessment, quality care given to newborns and mortality and morbidity data review.

## MATERIALS AND METHODOLOGY

A cross sectional study was conducted to evaluate NBCCs at 24X7 PHCs. There are total eleven 24X7 PHCs in Bhavnagar District and all were included in the study during June 2014 - November 2014 for facility level assessment. Data was collected after approval from Institutional Review Board, Government Medical College, Bhavnagar.

Study Tool (check list for facility assessment annexure 1.4/ pg 67) used in the study was adopted from FBNC Operational Guide: Guideline for Planning and Implementation; Ministry of Health and Family Welfare, Government of India, 2011. [6]

This study used Donabedian Model for quality assessment which is divided into 3 parts; Input, Process and Output. Elements included in INPUT assessment were information about services available for newborn care, staff and their training status which was obtained by interviewing MO of respective PHC who was informed in advance telephonically. Assessment of PHC infrastructure was made by observing facility. Availability of drugs was assessed by visiting pharmacy, interviewing pharmacist and by physical verification. Availability and functioning of equipments required for newborn care was assessed by physical verification. For PROCESS evaluation, quality care given to newborns was assessed either by observing day time deliveries or interviewing mothers whose delivery occurred in last 24 hours at facility during visit. During study period, it was possible to assess 33 newborns for quality care given to them. Hence during visit, only eight deliveries occurred in day time was observed and in rest of the women (i.e. 25) who gave written informed consent were interviewed 4 hrs after delivery. Women having IUFD were excluded from the study. Neonatal Morbidity and Mortality data (preceding month of visit) were used for OUTPUT assessment.

A pilot study was conducted at one 24X7 PHC and facility level information was collected by interviewing concern person (MO / pharmacist) and one delivery was observed. Query was discussed and solved to avoid difficulty in further data collection.

The data was entered, tabulated in Microsoft Excel 2007 and analyzed by using Epi. Info 7 software version.

## RESULTS

### Input

### FBNC services at PHCs:

There should be existence of NBCC at every 24X7 PHCs according to FBNC guideline. In the present study, all PHCs had NBCC but only one third of them [27.3% (3 out of 11)] had beds dedicated to newborn care. All PHCs had normal delivery services, essential newborn care services (Resuscitation, Thermal care, Breast feeding support), antenatal and postpartum care services, immunization services, essential laboratory services, electric supply. Most of PHCs (90.9%) had adequate lighting in labor room and newborn corner. Stand by generator for electricity was present in almost two-third PHCs (72.7%), however among them only 25% PHCs had functional electricity back-up with fuel. Majority PHCs (81.8%) had sufficient amount of safe water source for hand washing. Only 36.4% of PHCs had own vehicle for referral facilities. More than half PHCs (54.6%) had phone call facilities. Very few PHCs (18.2%) had staff for providing round the clock services [Table 1].

**Table 1: Availability of the facility based newborn care services at NBCC of 24X7 PHCs (N=11)**

| Variables | 24×7 PHCs (%) |
|---|---|
| **24 hour delivery and newborn coverage** | |
| Availability of staff duty roster | 2 (18.2) |
| Availability of skilled person for conducting deliveries | 2 (18.2) |
| **Facilities to provide various delivery services** | |
| Normal deliveries | |
| Administration of oxytocics/antibiotics/Inj. | 11 (100) |
| Magnesium sulphate/Management of PPH/Other Complications | 11 (100) |
| **Facility to provide essential newborn care services** | |
| Resuscitation | 11 (100) |
| Thermal care | 11 (100) |
| Breast feeding support services | 11 (100) |
| **Provision of referrals** | |
| Own vehicle | 4 (36.4) |
| 108 ambulance | 7 (63.6) |
| Both | 4 (36.4) |
| **Availability of** | |
| Antenatal care services | 11 (100) |
| Postpartum care services | 11 (100) |
| Immunization services | 11 (100) |
| Essential laboratory services* | 11 (100) |
| Phone call facility | 6 (54.6) |
| Electricity supply | 11 (100) |
| A back-up or stand by generator for electricity | 8 (72.7) |
| If yes, functioning - Yes | 2 (25) |
| Adequate lighting in the labour room and newborn corner | 10 (90.9) |
| Safe water source with sufficient amount for hand washing | 9 (81.8) |

*indicates essential laboratory services for ANC which include minimum services (urine pregnancy test, blood group, Hb estimation, HIV/AIDS test, urine sugar and albumin)

**Table 2: Infrastructure for providing new born care at NBCCs of 24X7 PHCs (N=11)**

| Designated area | 24×7 PHCs (%) |
|---|---|
| Labour room | 11 (100) |
| OT | 7 (63.6) |
| Postnatal ward/rooming-in | 2 (18.2) |
| Newborn corner | 11 (100) |
| Basin (for hand washing) | 10 (90.9) |
| Designated area for mixing I/V fluids | 6 (54.6) |
| Designated area for boiling and autoclaving | 9 (81.8) |
| Store room | 8 (72.7) |
| Duty room for doctors | 11 (100) |
| Duty room for nurses | 0 (0.0) |

**Infrastructure:** All PHCs had designated area for labour room, newborn corner, duty room for doctors but none of PHCs had duty room for nurses. Majority of PHCs had wash basin in labour room (90.9%) and designated area for boiling and autoclaving (81.8%). Almost three fourth of PHCs (72.7%) had store room. OT was present in 63.6% PHCs and half of PHCs (54.6%) had area for mixing I/V fluids. Only few PHCs (18.2%) had postnatal ward/rooming-in [Table 2].

**Human resources and their training status:** According to FBNC guideline, there is need for one MBBS MO, one AYUSH MO, one Pharmacist, one Laboratory Technician and 3 Staff Nurse at NBCC. Most of the PHCs were having MBBS MO (81.8%) and AYUSH MO (63.6%). Pharmacists were present in 63.6% PHCs and laboratory technicians were available in 72.7% PHCs. However Staff-Nurse was found only in few PHCs i.e. 27.3%. Most of MBBS MO (88.9%), AYUSH MO (71.4%) and staff nurse (66.7%) were trained in NSSK.

**Monitoring and Management Equipments:** Heart rate monitor was available and functioning at all PHCs. Similarly all PHCs had availability of radiant warmer of which most of them (81.8%) were functioning. Mechanical baby weighing was available at all PHCs and was functioning at most of PHCs (90.9%). Low reading clinical and digital thermometer was available and functional in majority PHCs (90.9%). Electronic baby weighing was available at 81.8% PHCs and was functioning at most (72.7%). However few important instruments - stethoscope with neonatal chest piece, BP monitor, Pulse oximeter and Room thermometer was not available in more than half of PHCs [Table 3].

**Resuscitation equipments:** Self inflating bag and mucus sucker was available and functional at all PHCs. Suction machine was also available in majority PHCs (81.8%) and most of them were functioning (72.7%). However foot operated suction pump and laryngoscope was available at very few PHCs (18.2%, 27.3% respectively). Although available, paramedical staff attending deliveries did not know how to use resuscitation equipments. Similarly many doctors said that they knew how to use it, but they did not have practical experience of the same [Table 3].

Oxygen cylinders and concentrator was available and functional at most of PHCs (90.9%, 81.8% respectively) [Table 3].

All PHCs had available and functional laboratory equipments (micro-hematocrit, multistix, microscope, computer), general equipments (spot lamp, wall clock with seconds' hand, surgical instruments, autoclave) and cold chain equipments (ice lined refrigerator, deep freezer).

**Drugs, Vaccines and Logistics:** All PHCs had required vaccines, logistics (0.1 and 0.5 ml AD Syringes, Reconstitution Syringes, Hub cutter), disinfectants (bleach powder/concentrated hypochlorite solutions for chemical disinfection of biomedical waste), necessary drugs for ENBC and drugs required at NBCC except Inj. Ampicilin and Inj. Vitamin K which was available at only 27.3% PHCs.

**Registers:** All PHCs (100%) were having delivery register and newborn register while death register was present in less than half of PHCs (45.5%) during visit.

**Table 3: Availability and status of equipments at NBCCs of 24×7 PHCs (N=11)**

| Details of equipments (As per FBNC Guideline) | Available and Functional (%) | Available and Not Functional (%) | Not Available (%) |
|---|---|---|---|
| **Monitoring equipment** | | | |
| Stethoscope with neonatal chest piece | 4 (36.4) | 0 (0.0) | 7 (63.6) |
| BP monitor | 5 (45.5) | 0 (0.0) | 6 (54.6) |
| Heart rate/Apnea Monitor | 11 (100) | 0 (0.0) | 0 (0.0) |
| Pulse oximeter | 4 (36.3) | 2 (18.2) | 5 (45.5) |
| Clinical and digital Thermometer | 10 (90.9) | 0 (0.0) | 1 (9.1) |
| Room thermometer | 5 (45.5) | 1 (9.1) | 5 (45.5) |
| Electronic baby weighing scale | 8 (72.7) | 1 (9.1) | 2 (18.2) |
| Mechanical baby weighing scale | 10 (90.9) | 1 (9.1) | 0 (0.0) |
| **Equipment for management** | | | |
| Radiant warmer | 9 (81.8) | 2 (18.2) | 0 (0.0) |
| **Resuscitation equipment** | | | |
| Self inflating bag | 11 (100) | 0 (0.0) | 0 (0.0) |
| Foot operated suction pump | 2 (18.2) | 0 (0.0) | 9 (81.8) |
| Suction machine | 8 (72.7) | 1 (9.1) | 2 (18.2) |
| Laryngoscope | 3 (27.3) | 0 (0.0) | 8 (72.7) |
| Mucus sucker | 11 (100) | 0 (0.0) | 0 (0.0) |
| **Oxygenation facility** | | | |
| Oxygen cylinders | 10 (90.9) | 0 (0.0) | 1 (9.1) |
| Concentrator | 9 (81.8) | 0 (0.0) | 2 (18.2) |

**Table 4: Utilization of essential newborn care services at NBCCs of 24X7 PHCs (Total 33 newborns were assessed at PHCs)**

| | No. (%) |
|---|---|
| **Postnatal Services** | |
| Airway passage cleaning | 33 (100) |
| Cord care given properly | 33 (100) |
| Eye care given properly | 0 |
| **Warm chain** | |
| By KMC | 2* (6.1) |
| By keeping in warm clothes | 31 (93.9) |
| Skin care given properly (Bathing Delayed for 6 hrs) | 29 (87.9) |
| **Warm chain** | |
| By KMC | 2* (6.1) |
| By keeping in warm clothes | 31 (93.9) |
| Looked for congenital malformations | 33 (100) |
| **Any prelacteal feeding given** | |
| Yes | 3 (9.0) |
| No | 30 (90.9) |
| **Colostrum given** | |
| Yes | 28 (84.9) |
| No | 5 (15.2) |
| **Breast feeding- Time of starting** | |
| <1 hr | 25 (75.8) |
| 1-4 hrs | 7 (21.2) |
| > 4hrs | 1 (3.0) |
| **Immunization** | |
| BCG | 0 (0.0) |
| OPV | 33 (100) |
| Hep-B | 33 (100) |

*indicates out of 33 children one newborn was LBW

### Process

**Utilization of newborn Care Services:** Total 33 newborns were assessed in terms of provision of quality care. Eight delivery occurred in day time were observed and 25 women whose delivery occurred in last 24 hours were interviewed. At 24X7 PHCs, essential newborn care services were given by MO. All newborns were given proper airway passage cleaning, cord care (clean cord cutting and tying), proper skin care (delaying bathing) and examined for congenital malformation however none of them were given eye care. There was one Low Birth Weight (LBW) baby and to prevent hypothermia Kangaroo mother care (KMC) was advised and in rest of babies hypothermia was prevented by keeping baby in warm clothes. Most of newborns (84.9%) were given Colostrum and in most of babies (75.8%) breastfeeding was initiated within one hour of delivery. There is good awareness regarding importance of breast feeding and colostrum in study participants. Recommended vaccines (OPV0, Hep B) were given at facility except BCG (BCG vaccine to be given at Anganwadi at six weeks) [Table 4].

### Output

**Record analysis of mortality and morbidity profile of newborn:** Mortality and morbidity data of previous month was reviewed by checking reporting format which is sent regularly by PHC to district. It was found that death was not being recorded at 24X7 PHCs as most of serious cases were referred to either Tertiary Care Hospital or private doctors. Among morbidity profile data, only LBW was recorded.

## DISCUSSION

Adaptation of newborn baby to extra uterine life to a large extent is determined by quality of care that

he or she receives immediately after birth. Government's efforts for the same exist since 1950s and improving newborn survival is a major priority in child health today. With launch of National Rural Health Mission (NRHM), focus on newborn care has become central to the child health strategy both at community and facility level. Among facility level newborn care, NBCCs provide an acceptable environment for all infants at birth and its existence is mandatory at all delivery points. Hence availability of quality newborn care at NBCCs is very much essential which will further helps in reduction of neonatal mortality and morbidity. Along with existence of newborn care services, availability of maternal health services is equally important as neonatal health is also influenced by maternal health also. Present study reported that all PHCs were having 24 hour delivery services, essential newborn care services, antenatal, intranatal and postpartum care and immunization services. Study done by Ninama et al [10] in PHCs of Rajkot, study by Sodani PR et al [11] in PHCs of Rajasthan and NRHM report in 7 states [12] also reported that most of PHCs were providing 24 hour delivery along with newborn care services, ENBC services, antenatal, intranatal and postpartum care and immunization services.

Apart from care of newborn at birth another important service to be available at NBCCs is care of sick newborn by early identification and prompt referral of risk or sick newborn. Hence availability of own vehicle and phone call facility is essential at every PHC. In our study only 36.4% PHCs were having their own vehicle for referral which will delay in initiation of treatment of sick newborn. Similar situation was found in PHCs of Rajkot in a study by Ninama et al [10] and NRHM report of 7 states [12]. However study done by Shah R et al in Ahmedabad district, Gujarat [13] reported that most of PHCs had their own vehicle and was functional. In our study, phone call facilities were available in half of the PHCs and almost similar findings reported by Sodani PR et al in their study in Bharatpur districts of Rajasthan. [14]

In this study, all PHCs (100%) had designated area for labour room and newborn corner and 63.6% PHCs had operation theatre. Sodani PR et al in their study observed that labour room was available at most of PHCs while none of the PHCs have fully equipped newborn corner and very few PHCs had operation theatre. [14] NRHM report showed that almost half of PHCs had separate labour room and very few PHCs had operation theatre. [12] Ninama R et al observed that operation theatre was not available in any PHC of Rajkot district of Gujarat. [10]

At NBCCs, it is expected to provide round the clock services hence it is important that adequate numbers of MOs, Staff nurses are posted at PHC as well as staying within premises. Shortfall of manpower leads to increase workload, decrease in efficiency and effectiveness of work done and also hamper in provision of quality newborn care services. In the present study, most of PHCs were having MOs (MBBS & AYUSH). However there was deficit in staff nurse at PHCs. Position of most of staff was filled up in PHCs of Rajkot District, Gujarat, [10] in PHCs of 7 states in NRHM report, [12] in PHCs of Ahmedabad District, Gujarat, [13] and in PHCs of Bharatpur districts of Rajasthan. [14]

In the present study, equipments for Newborn monitoring (heart rate monitor), Resuscitation equipments (self inflating bag, mucus sucker), Laboratory instruments (micro-hematocrit, multistix, microscope), record keeping equipments (computer), general equipments (spot lamps, wall clock with seconds' hand, surgical instruments, autoclave equipment), cold chain equipments (ice lined refrigerator, deep freezer) were available and functional in all PHCs. The equipments for growth monitoring (mechanical and electronic baby weighing scale), equipments for examination of a sick child (clinical and digital thermometer) for IMNCI practice were available and functional at almost two-third PHCs. Radiant warmer was located in labour room in all PHCs and it was functional at most of PHCs. However few important instruments (stethoscope with neonatal chest piece, BP monitor, Pulse oximeter, Room thermometer) was not available in more than half of PHCs. Contrast to our study, Sodani P et al. reported that very few 24X7 PHCs were having availability of radiant warmers, newborn resuscitators; half of PHCs had suction pump, weighing scale, however majority PHCs were having thermometers and hub cutter. Functional status of these equipments was not mentioned. [14] Chauhan M et al. also reported availability and functionality of most of Neonatal equipments. Major gap between availability and functional status was observed for oxygen concentrator, by radiant warmer and suction machine in their study. [15]

In the present study, there was adequate availability of all essential drugs, vaccines, logistics and disinfectant. However drug required for newborn care (Inj. Vit K and Inj. Ampicillin) were lacking in few PHCs which might leads to improper treatment and hence discontinuation of treatment. The similar results were obtained in a study by Ninama R et al in PHCs of Rajkot district, [10] Shah R et al in PHCs of Ahmedabad district, Gujarat, [13] wherein there was adequate availability of all essential drugs. However study by Chauhan M et al. for assessment of NBCCs in PHCs in Bihar found very

few PHCs were having Essential drugs (adrenaline and Vitamin K injection). [15]

## CONCLUSION AND RECOMMENDATION

Under the aegis of NHM, there has been significant progress in provision of services to newborn care. This study highlights further scope in improvement in functioning of NBCCs, in terms of provision of vehicle for referral facilities, fulfilling identified gaps of staff nurse, ensuring availability and functionality of monitoring and resuscitation equipments and maintaining record of newborn morbidity and mortality.

## LIMITATIONS

Due to non availability of staff at night time and availability according to on call basis, only day time deliveries were observed. During facility visit, it was possible to observe only eight deliveries at 24X7 PHCs. In rest of deliveries-mothers was interviewed. Hence chance of recall bias might be there.

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