Original Research Article

Assessment of Facility based newborn care at various health care facilities in Rajkot district

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ABSTRACT

Background: India carries the single largest share (around 25-30%) of neonatal deaths in the world. It has been estimated that about 70% of neonatal deaths could be prevented if proven interventions are implemented effectively with high coverage.
Methods: A cross-sectional observational study was conducted at various health facilities of Rajkot district where facility based newborn care are created as per the guidelines under NRHM. It was conducted during August 2013 to October, 2013. The data entry was done in Microsoft Office Excel 2007 and analyzed in Epi info software from CDC Atlanta.
Results: This study included total 32 health facilities including 10 Primary Health Centers (PHC) (24X7), 15 Community Health Centers (CHC), 5 Sub District Hospitals (SDH), one District Hospital (DH) and one Medical College (MC). There are a total of 36 facilities of different level available in government set up for newborn care starting from NBCC to SNCU. All (100%) of the health centers visited were equipped with NBCC for newborn care, while NBSU and SNCU for newborn care were created at only 2 (6.2%) centers respectively. Only 2 out of 10 PHC had all required equipments for NBCC. All the required equipments were available at 3 CHCs out of total 15 CHCs. All the SDH were having adequate equipment for NBCC except resuscitator & separate Digital Thermometer were not available at 2 SDH. At DH, except for Digital thermometer, all equipments were adequate. Only 1 SDH has been established for NBSU and it did not have adequate no. of radiant warmer and resuscitator. DH is lacking in all the required equipment for SNCU except for resuscitator (250 ml) and refrigerator. Out of total 101 health personnel, 68 (67.3%) have been trained for NSSK. From total 68 trained health personnel, 12 (17.7%) got the score above the cut off for resuscitation skill. Out of the trained respondents, 29 (42.7%) acquired score above cut off for routine care.
Conclusion: All the PHCs, CHCs, SDHs and DH were deficient in equipments. NBSU was created in only one SDH. SNBU was created at DH and MC, but equipments were not sufficient at both centers. Health care providers involved in facility based newborn care units had poor knowledge regarding routine newborn care and also not properly trained in resuscitation.

Keywords: Assessment, Facility based newborn care units, Knowledge, skills

INTRODUCTION

Every year, four million newborn babies die in the first month of life—99% in low- and middle-income countries.[1] The infant mortality rate in India has remained almost unchanged since the early nineties, and the near-static rate of neonatal mortality, despite introducing several primary care-based strategies and programs at the national level during that period, is considered to be the

major reason for this.[2] India carries the single largest share (around 25-30%) of neonatal deaths in the world. Neonatal deaths constitute two-thirds of infant deaths in India; 45% of the deaths occur within the first two days of life.[3] It has been estimated that about 70% of neonatal deaths could be prevented if proven interventions are implemented effectively with high coverage.[4] It was further estimated that health facility based interventions can reduce neonatal mortality by 23-50% in different settings.[4] Facility-based newborn cares, thus, has a significant potential for improving the survival of newborns in India.

Infant mortality rate (IMR) - 50/1000 live births, (SRS 2009), which was further reduced to 47/ 1000 live births by 2010.[5,6] Neonatal mortality contributes about two-thirds of all infant deaths neonatal mortality rate (NMR) 35/1000 live births (SRS 2008).

The rate of decline in neonatal mortality rate in India is slow (37/1000 live births in 2004 to 35/1000 live births in 2008).[7] Reduction in deaths in the 1st week of life has shown the least progress. Common causes of neonatal mortality in India are hypothermia, asphyxia, sepsis and respiratory distress; many of which are preventable. Facility-based newborn care has a significant potential for improving newborn survival by preventing these causes.[8] It has been estimated that health-facility based interventions can reduce neonatal mortality by as much as 23-50%.[9]

In order to accelerate the achievement of national and Millennium Development Goals (MDGs) to bring down childhood mortality, Government of India has proposed to strengthen Facility Based Newborn Care at various levels of public health facilities in year 2011.[3] In regard to this it is necessary to assess the knowledge and skills of the health personnel involved in the newborn care.

METHODS

Study design

Cross-sectional, observational study.

Study area

The study was conducted at various health facilities of Rajkot district where facility based newborn care are created as per the guidelines under NRHM.

Study sample

There were total 32 health facilities including 10 Primary Health Centers (PHC) (24X7), 15 Community Health Centers (CHC), 5 Sub District Hospitals (SDH), one District Hospital (DH) and one Medical College (MC).

Study period

August 2013 to October 2013.

Sampling unit

10 PHCs are 24×7. In all 24×7 NBCC are created. All New Born Care Units (NBCC) created were studied. All 15 CHC/FRUs were studied for NBCC (at labor room and operation theatre). All 5 Sub District Hospitals were studied for NBCC (at labor room and operation theatre) as well as new born stabilization unit (NBSU). One District hospital and Medical College were studied for NBCC, NBSU and specialized new born care unit (SNCU)

Study participants

All those doctors and nurses/auxiliary nursery midwives (ANMs)/ female health workers (FHWs) who have received training of facility based newborn care present on the day of visit were assessed.

Study tool

A quality assurance checklist was developed to assess the availability and quality of services. This checklist assessed all health care facilities on parameters that included infrastructure, equipment maintenance, human resources, supply of drugs and consumables, adherence to protocols, and record keeping.

Method of data collection

Quantitative method was used for data collection. For quantitative method pre-tested semi-structured questionnaire for information collection and direct observation for functionality of equipments and skill assessment of doctors & nurses was used. For skill assessment staff was asked to demonstrate the skills on mannequin.

Statistical analysis

The data was entered in MS Excel 2007 and analyzed in Epi info software from CDC Atlanta.

RESULTS

This study was carried out to assess the status of the equipments and the knowledge and skills of the health personals involved in New Born Care (NBC). Total 32 health centers were visited including 10 Primary Health Centers (PHC) (24X7), 15 Community Health Centers (CHC), 5 Sub District Hospitals (SDH), one District Hospital (DH) and one Medical College (MC). The following are the results found in the study.

Table 1 shows total of 36 facilities of different level available in govt. set up for newborn care starting from NBCC to SNCU.

Table 2 revealed that all the PHCs were having functional with adequate amount of hub cutters but other equipments were not found in all the PHCs. Not all CHCs were equipped as required for NBCC but only radiant warmer and weighing scale were fully functional at all CHCs. But SDHs and DH were having functional with adequate equipment as required except digital

thermometer. MC was equipped with all the equipment as required for NBCC.

Table 1: Type of facility based newborn care available in Rajkot district.

Facility based newborn care created	Total no n (%)
Newborn Care Corner (NBCC)	32 (100.0)
Newborn Stabilization Unit (NBSU)	02 (6.2)
Specialized Newborn Care Unit (SNCU)	02 (6.2)

Table 2: Adequacy and functioning of equipments at newborn care corner (NBCC).

Equipments	Adequate / Functional						
	PHC (N = 10) n	CHC (N = 15) n	SDH (N = 5)		DH (N = 1)		MC (N = 1) n
			Labor room n	OT n	Labor room n	OT n	
Radiant warmer (1)	07 / 07	15 / 15	05 / 05	02 / 02	01 / 01	01 / 01	01 / 01
Resuscitator (500 ml) (1)	08 / 08	12 / 12	04 / 04	02 / 02	01 / 01	01 / 01	01 / 01
Pump suction (1)	07 / 06	14 / 14	05 / 05	02 / 02	01 / 01	01 / 01	01 / 01
Weighing scale (1)	09 / 09	15 / 15	05 / 05	01 / 01	01 / 01	01 / 01	01 / 01
Digital thermometer (1)	07 / 07	03 / 03	04 / 04	00 / 00	00 / 00	00 / 00	01 / 01
Hub cutter (1)	10 / 10	14 / 14	05 / 05	02 / 02	01 / 01	01 / 01	01 / 01

Table 3: Distribution according to adequacy and functionality of equipments at NBSU.

Equipments	Adequate		Functional	
	SDH (N = 5) n (%)	MC (N = 1) n (%)	SDH (N = 5) n (%)	MC (N = 1) n (%)
Radiant warmer (3)	00 (00.0)	01 (100.0)	00 (00.0)	01 (100.0)
Resuscitator (500 ml) (2)	00 (00.0)	01 (100.0)	00 (00.0)	01 (100.0)
Weighing scale (electronic) (1)	01 (20.0)	01 (100.0)	01 (20.0)	01 (100.0)
Pump suction (1)	01 (20.0)	01 (100.0)	01 (20.0)	01 (100.0)
Digital thermometer (4)	00 (00.0)	00 (00.0)	00 (00.0)	00 (00.0)
Hub cutter (1)	00 (00.0)	01 (100.0)	00 (00.0)	01 (100.0)
Phototherapy unit, single head (1)	01 (20.0)	01 (100.0)	01 (20.0)	01 (100.0)
Laryngoscope set, neonate (2)	01 (20.0)	01 (100.0)	01 (20.0)	01 (100.0)

Table 4: Distribution according to adequacy and functionality of equipments at SNCU.

Equipments	Adequate		Functional	
	DH (N = 1) n(%)	MC (N = 1) n(%)	DH (N = 1) n(%)	MC (N = 1)n(%)
Radiant warmer (12)	00 (00.0)	01 (100.0)	00 (00.0)	01 (100.0)
Resuscitator (500 ml) (4)	00 (00.0)	01 (100.0)	00 (00.0)	01 (100.0)
Resuscitator (250 ml) (2)	01 (100.0)	01 (100.0)	01 (100.0)	01 (100.0)
Weighing scale (electronic) (4)	00 (00.0)	01 (100.0)	00 (00.0)	01 (100.0)
Pump suction, portable, 200 V (2)	00 (00.0)	01 (100.0)	00 (00.0)	01 (100.0)
Digital thermometer (12)	00 (00.0)	00 (00.0)	00 (00.0)	00 (00.0)
Hub cutter (2)	00 (00.0)	01 (100.0)	00 (00.0)	01 (100.0)
Phototherapy unit, single head (6)	00 (00.0)	01 (100.0)	00 (00.0)	01 (100.0)
Laryngoscope set, neonate (6)	00 (00.0)	01 (100.0)	00 (00.0)	01 (100.0)
Oxygen concentrator (4)	00 (00.0)	00 (00.0)	00 (00.0)	00 (00.0)
Pulse oxymeter (6)	00 (00.0)	01 (100.0)	00 (00.0)	01 (100.0)

Table 3 shows that only single SDH was adequate in equipments for NBSU. All the equipments at SDH were functional. In MC, except digital thermometer, all other equipments required for NBSU were adequate as well as functional.

Table 4 shows at DH equipped with NBSU, only resuscitator (250 ml) in adequate number and functional. While at MC equipped with NBSU, radiant warmer, resuscitator, pump suction, laryngoscope set, digital thermometer, oxygen concentrator and pulse oxymeter were adequate and functional.

Table 5 shows total 68 (67.3%) of 101 respondents were found trained in NSSK at the time of survey. While regarding FIMNCI and FBNC training status, only 16 (15.8%) and 2 (1.9%) respondents were trained respectively. Pediatrician (20%) and MBBS medical officer (52%) were the least trained personnel on NSSK.

Table 6 shows distribution of health personnel according to score obtained in skill assessment of resuscitation. Here score is divided into less than 85 and 85 or more because in NSSK training person getting score of 85 or more is only considered trained. We can see from the table that only 2 pediatrician (40%) got score of 85 or more, while none of AYUSH MO, ANM and FHW could get score of 85 or more. Even residents of paediatrics department were also lacking in the skill.

Table 5: Training status of respondents.

Respondent's designation	Training			Total n (%)
	NSSK n (%)	FIMNCI n (%)	FBNC n (%)	
Pediatrician	01 (20.0)	01 (20.0)	01 (20.0)	5(100.0)
MO (MBBS)	13 (52.0)	07 (28.0)	00 (00.0)	25 (100.0)
MO (AYUSH)	03 (75.0)	00 (00.0)	00 (00.0)	4 (100.0)
Staff Nurse	42 (73.7)	07 (12.3)	00 (00.0)	57 (100.0)
ANM	02 (66.6)	00 (00.0)	01 (33.3)	3 (100.0)
FHW	03 (100.0)	01 (33.3)	00 (00.0)	3 (100.0)
Residents (Pediatrics)	04 (100.0)	00 (00.0)	00 (00.0)	4 (100.0)
Total	68 (67.3)	16 (15.8)	02 (1.9)	101 (100.0)

Table 6: Distribution according to score obtained by health personnel in skill assessment (resuscitation).

Health personnel	Score		Total n (%)
	85 or more n (%)	< 85 n (%)	
Pediatrician	02 (40.0)	03 (60.0)	5(100.0)
Medical Officer (MBBS)	03 (12.0)	22 (88.0)	25 (100.0)
Medical Officer (AYUSH)	00 (00.0)	04 (100.0)	4 (100.0)
Staff Nurse	08 (14.0)	49 (86.0)	57 (100.0)
ANM	00 (00.0)	03 (100.0)	3 (100.0)
FHW	00 (00.0)	03 (100.0)	3 (100.0)
Residents (pediatrics department)	01 (25.0)	03 (75.0)	4 (100.0)

Table 7: Distribution according to score obtained by health personnel in skill assessment (routine care).

Health personnel	Score		Total n (%)
	85 or more n (%)	< 85 n (%)	
Pediatrician	03 (60.0)	02 (40.0)	5(100.0)
Medical Officer (MBBS)	04 (16.0)	21 (84.0)	25 (100.0)
Medical Officer (AYUSH)	01 (25.0)	03 (75.0)	4 (100.0)
Staff Nurse	23 (40.4)	34 (59.6)	57 (100.0)
ANM	00 (00.0)	03 (100.0)	3 (100.0)
FHW	01 (33.3)	02 (66.6)	3 (100.0)
Residents (pediatrics department)	01 (25.0)	03 (75.0)	4 (100.0)

Table 7 shows distribution of health personnel according to score obtained in skill assessment of routine care of newborn. In routine care also only 3 (60%) pediatrician could get score of 85 or more. More staff nurses (40.4%) got score of 85 or more than MBBS medical officers (16%) and AYUSH medical officer (25%).

DISCUSSION

This study was cross-sectional observational study carried out to assess the status of the equipments and the knowledge and skills of the health personals involved in New Born Care (NBC). Total 32 health centers were visited including 10 Primary Health Centers (PHC) (24×7), 15 Community Health Centers (CHC), 5 Sub District Hospitals (SDH), one District Hospital (DH) and one Medical College (MC).

This study was shows that all 32(100%) NBCC were found partially functional as they were not follow five criteria for fully functional while in study chauhan et al in Bihar, India shows majority 39 (68.4%) of the NBCCs were partially functional and 5 (9%) NBCCs were nonfunctional at the time of the assessment.[10]

This study revealed that some neonatal equipment were not available majority of health facility while in the study chauhan et al shows neonatal equipment were available and functional in most of the facilities and in study Neogi et al in Haryana, India shows Shortage of basic equipments and supplies at most of the special baby care units.[10,11]

Availability of skilled health-care staff is the key for quality service provision. In this present study shows total 68 (67.3%) of 101 respondents were found trained in NSSK at the time of survey. While regarding FIMNCI and FBNC training status, only 16 (15.8%) and 2 (1.9%) respondents were trained respectively. Pediatrician (20%) and MBBS medical officer (52%) were the least trained personnel on NSSK while in the study chauhan et al shows 66.4% medical officers, 72.7% SNs/ANMs, and 62.2% ancillary staff were trained.[10]

In this study shows out of 101 health personnel, only 13 (14%) health care staff were able to provide proper resuscitation while chauhan et al revealed that 20% of the medical officers and 15% of the SNs/ANMs were not able to use essential newborn care equipment such as Ambu bag, radiant warmer, oxygen concentrator, and suction machine.[10]

CONCLUSION

All the PHCs, CHCs, SDHs and DH were deficient in equipments. NBSU was created in only one SDH. SNBU was created at DH and MC, but equipments were not sufficient at both centers. Health care providers involved in facility based newborn care units had poor knowledge regarding routine newborn care and also not properly trained in resuscitation.

Recommendations

All the PHCs, CHCs, SDHs and DH were deficient in equipments so it is strongly recommended to provide the adequate numbers of equipments to these centers. Training regarding NSSK should be provided to all the health personnel involved in newborn care. Health personnel should be sensitized or reoriented time to time regarding various knowledge and skill for newborn care. All newborn care centers from NBCC to SNBU should be monitored by experts at particular time to check equipment status and ensure that health personnel are following standard guidelines.

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