Neonatal Near Miss Cases of Different Health Facilities

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Abstract

Introduction: The near miss concept and the criterion-based clinical audit are proposed as useful approaches for obtaining such information in newborn health care. There is currently no Standard definition and criteria for neonatal near miss especially for the community level intervention. Thus, life-saving interventions could be an entry point to initiate the development of the neonatal near-miss definition. Mother and Infants Research Activities and Health Right International (HRI) developed a new tool for assessing neonatal near miss cases based on the Community based newborn care package programme. This is a part of operational research programme on strengthening the health facilities of Electoral constituency No; 2 of Arghakhanchi district of Nepal. The objective of this study was to identify and analyze neonatal near miss cases at different health facilities of Electoral constituency No; 2 of Arghakhanchi district, Nepal. **Materials and Methods:** One day of training on identifying neonatal near miss cases was given by an expert at Arghakhanchi district hospital to the health facilities staff in two groups. Health facility staffs were trained on identifying neonatal near miss cases and completing the modified neonatal near miss case forms. Neonatal near miss cases were documented for nine months period. **Results:** There were a total of 28 cases of neonatal near miss reported from different health facilities. Among them, 90% babies were delivered at health facility and 72% babies were of normal birth weight. Low birth weight incidence is 21% among near miss cases. Neonatal near miss contributed possible severe bacterial infection/ severe infection 47%, birth asphyxia in 43% cases and very low birth weight 7%. **Conclusions:** Birth asphyxia and PSBI were the two most common causes of neonatal near miss in the health facilities of Arghakhanchi district. There is a need to improve the quality of neonatal care in health facilities to properly manage these neonatal near miss cases which were referred to higher centre.

Key words: Birth asphyxia, neonatal near miss, possible severe bacterial infection (PSBI)

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Introduction

The near miss concept and the criterion-based clinical audit are proposed as useful approaches for obtaining such information in newborn health care. Neonates with severe complications at birth or during the neonatal period who nearly died but survived constitute neonatal near miss

cases. There is however, no standard WHO definition or internationally agreed identification criteria for neonatal near miss cases. Development of such criteria would facilitate the use of neonatal near miss as a measure of quality of newborn care tool[1]. There is currently no standard definition and criteria for neonatal near miss especially for the community level intervention.

Pileggi C et al[2] described neonatal near miss cases as severe life threatening condition at birth, e.g. gestational age of < 30 weeks, birth weight <1.5kg and Apgar score at 5 minutes <7. Souza JP et al[3] described neonatal near miss as consisting of clinical organ dysfunction criteria, e.g. tachypnea, bradycardia, etc. and laboratory marker of organ dysfunction, e.g. SPO_2 less than 80%, serum pH <7.1, etc. Similarly, Knijf AD et al described neonatal near miss cases as the babies with signs of respiratory failure/dysfunction, cardiac failure/dysfunction, CNS failure/dysfunction, etc[4].

But in developing countries like Nepal, the above mentioned criteria may not be followed properly in the community setting as most of the health facilities in the community are providing level I and partly level II newborn care. Thus, life-saving interventions could be an entry point to initiate the development of the neonatal near-miss definition; together with other indicators of increased risk of death, e.g. infants who survived extreme preterm birth, very low birth weight, severe birth asphyxia, severe birth trauma, and neonatal sepsis could be considered as neonatal near miss cases. MIRA and HealthRight developed a new tool for assessing neonatal near miss cases based on the CB-NCP programme. This is a part of operational research (OR) programme by Mother and Infant Research Activities (MIRA) and HealthRight International (HRI) on strengthening the health facilities of electoral constituency No; 2 (EC 2) of Arghakhanchi district in Nepal. One part of operational research is to train health facility staff on newborn care and setting up neonatal corners at health facilities and conducting neonatal near miss analysis in the health facilities to improve neonatal quality care. The operational research study was started on 1st October 2010 till 14th April 2013 (Chaitra 2069).

The objective of this study were to identify and analyze neonatal near miss cases at different health facilities of EC 2 of Arghakhanchi district, Nepal.

Material and Methods

As a part of operational research for strengthening the health facilities of EC 2, one day training on identifying neonatal near miss cases was given at Arghakhanchi district hospital to the staff of health facilities EC no.2 of Arghakhanchi district for two days, for two groups. 37 health staff including doctor, staff nurse, Health Assistant (HA), and Auxiliary nurse midwives (ANM) of different health facilities were trained on completing the modified neonatal near miss case forms. Neonatal near miss cases were documented for nine months duration.

Criteria determined for neonatal near miss cases:

Any one of the following conditions was taken as a neonatal near miss case in this study:

1. Any neonate who received bag and mask ventilation from a Female Community Health Volunteer (FCHV), Village Health Worker (VHW), Maternal and Child Health Worker (MCHW), or any health worker during neonatal resuscitation.
2. Any neonate who was managed for Very Low Birth Weight (birth weight < 1.5 kg) by a FCHV, VHW, MCHW or any health worker
3. Any neonate treated &/or referred for any one of the following ten conditions of Possible Severe Bacterial Infection (PSBI)[5].
    1. Unable to breastfeed
    2. Lethargic or unconscious
    3. Fast breathing
    4. Severe chest indrawing
    5. Grunting
    6. Fever
    7. Hypothermia
    8. Umbilical discharge with redness extending up to surrounding skin
    9. Ten or more than ten pustules over skin of baby or one big abscess
    10. Weak or absent cry

Data were entered in SPSS 16 and frequency and tabulation were obtained. Causes of neonatal near miss cases were analyzed.

Results

There were a total of 28 cases of neonatal near miss reported from different health facilities of EC No.2 constituency of Arghakhanchi district. Among them, 18 cases were reported from Arghakhanchi district hospital, five cases from Thada PHC, two cases each from Subarnakhal HP and Pokharathok HP.

While analyzing 28 babies with neonatal near miss condition, 90% (25) babies were delivered at health facility whereas three babies (10%) were delivered at home depicted in Fig. 1. According to birth weight category, most of the babies 72% (20) were of normal weight, 21% (6) babies were low birth weight and 7% (2) babies were very low birth weight, which were depicted in Fig 2.

While analyzing resuscitative procedures applied in 28 near miss cases, 60% (17) were provided initial steps including suction and tactile stimulation and 40% (11) did not required any form of resuscitation. Among those 17 asphyxiated babies, 65% (11) received bag and mask ventilation by health workers which were depicted in Fig. 3. While analyzing the outcome of neonatal near miss babies 57% (16) were discharged from health facilities after treatment by health personnel whereas 43% (12) were referred to higher tertiary centre depicted in Fig. 4. Among 12 referred cases, three cases each were of septicemia, birth asphyxia and high fever. Two babies were of very lowbirth weight and one baby had pneumonia.

Analysis of near miss cases showed Possible severe bacterial infection (PSBI)/severe infection 47% (13), Birth asphyxia in 43% (12), very lowbirth weight 7% (2) and meconium aspiration 3% (1) which are depicted in Fig. 5 and Table 1. Among six PSBI cases, three cases with high fever, two cases are hypothermia and one case is of umbilical sepsis.

Table 1: Causes of neonatal near miss cases

SN	Suspected Diagnosis	Frequency	%
1	Possible severe bacterial infection (PSBI)/severe infection	13	47
1.1	Possible severe bacterial infection (PSBI)	6	
1.2	Septicemia	5	
1.3	Pneumonia	2	
2	Birth asphyxia	12	43
3	Very Low birth weight	2	7
4	Meconium aspiration	1	3
	Total	**28**	**100**

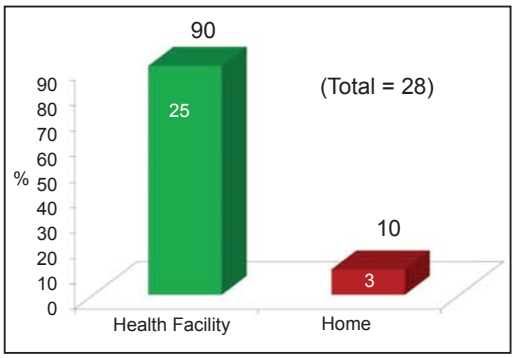

Fig. 1: Delivery place of neonatal near miss cases

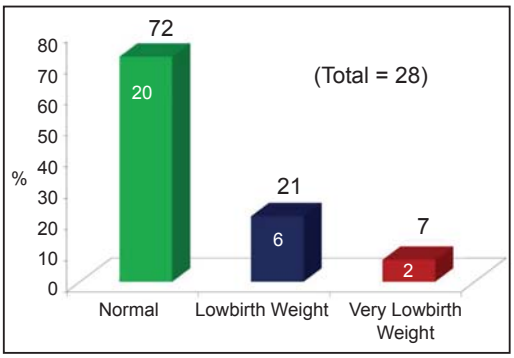

Fig. 2: Weight category of neonatal near miss case

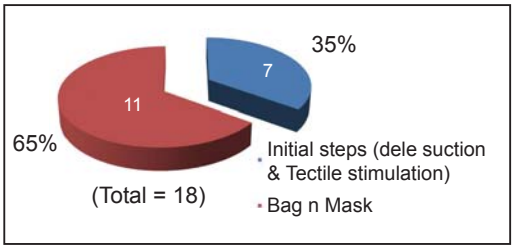

Fig. 3: Resuscitation procedure done in neonatal near miss cases

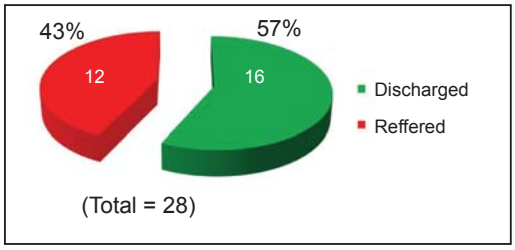

Fig. 4: Outcomes of neonatal near miss cases

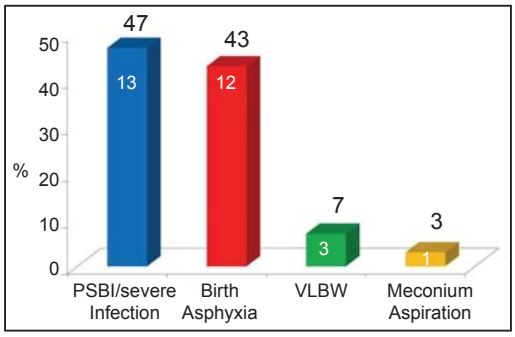

Fig. 5: Neonatal near miss category

Discussion

Possible severe bacterial infection (PSBI)/ severe infection were the commonest cause (47%) of neonatal near miss followed by birth asphyxia (43%). Among 60% (17) of the asphyxiated babies, some form of neonatal resuscitation procedures were provided. Avenant T[6] also postulated intrapartum asphyxia as a commonest cause (12.9%) of neonatal near miss which is also resembled in this study.

A social practice of wrapping babies with dirty clothes in the community and improper hand washing before touching babies could be important contributing factors for neonatal sepsis as severe infection was the commonest cause (47%) of neonatal near miss. Similarly, it was seen that 57% (16) near miss cases were treated successfully by health personnel. This could be due to impact of proper neonatal near miss identification and treatment after neonatal near miss training.

In a study done by Pileggi Castro C et al[7] defined one of the neonatal near miss criteria as birth weight < 1.5 kg with a sensitivity of 72.6% (70.6–74.5) and specificity of 97.4% (97.4–97.5), which is included in this study also as one of the criteria for neonatal near miss. So, such studies will help to postulate definite criteria for diagnosing neonatal near miss perticulalrly in community setting.

Conclusions

Severe infection/ PSBI and birth asphyxia were the two most common causes of neonatal near miss in the health facilities of Arghakhanchi district.

Recommendations

There is a need to improve the quality of antenatal care and intrapartum management to reduce asphyxia in the health facilities. There is still need to improve the quality of neonatal care at the health facilities to properly manage these neonatal near miss cases which were referred to higher centre. There is a need of regular training to health staff and regular supply of essential equipments like warm cot, Resuscitaire, Ambu bag at least in district hospital for improving the quality of neonatal care in health facilities in order to manage these neonatal near miss cases which were referred to higher centres. The training on neonatal near miss could have a good impact on managing high risk babies. For development of proper guideline for neonatal near miss tool, such more studies on neonatal near miss are required.

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Permission from IRB: Yes

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