Management of Newborn Infection: Knowledge and attitude among health care providers of selected sub-district hospitals in Bangladesh

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Abstract

Newborn infection is one of the leading causes of under-five mortality in the developing countries. It is one of the priority areas in Bangladesh, and the Government is trying to manage newborn infection at sub-district health facilities. However, newborn management is found to be a challenge for primary care settings. This study was an attempt to understand the practice-based knowledge of health care providers’ (HCP), and attitude in the management of newborn infection. A cross-sectional study was carried out using semi-structured interview among forty-five HCPs (Medical Physicians, paramedics, and nurse) working in two UHCs (Upazila Health Complex). Collected data were descriptively analysed using STATA (version 13). The respondents’ average work experience was 15.1 years, and 64% of them received formal training on managing newborn. Three-quarters of the respondents successfully identified four to five danger signs of recent infection. However, only one-third respondents were found to know about the standard guidelines. Two-thirds (66.67%) of the service providers reported not to use antiseptic precaution correctly as the process is considered time-consuming. More than one-fourth of the service providers believed the UHCs were not the right place to manage newborn, so they preferred to refer them to a higher facility. Inappropriate knowledge, lack of motivation to understand, to maintain standard protocols and misperceptions with regards to hygiene were found as the main deterrents in providing care on newborn infection.

Keyword: Knowledge, Attitude, Newborn Infection, Healthcare provider, Bangladesh
Background

At the beginning of the twenty-first century, the pace of neonatal dying was around 450 per hour (Lawn et al., 2005). After the encouraging achievement of the Millennium Development Goals (MDGs), the episodes of neonatal mortality have declined. However, with the consideration of current toll of 2.9 million per year, newborn death can be defined as the MDGs unfinished agenda (Organization, 2014). Half of these deaths were proclaimed to transpire at home due to the causes of infection (sepsis), birth injury, preterm birth, asphyxia, and congenital malformations (Bhutta et al., 2005, Lawn et al., 2005). Neonatal deaths attributable to perinatal and newborn infection is paramount for low to middle-income countries (Edmond et al., 2008). Besides the medical condition, there are multiple factors of demographic, socio-economic, health system, and cultural practice considers as secondary contributors (Mekonnen et al., 2013, Bhutta et al., 2005, Organization, 2014).

Acknowledging the importance of focusing on neonatal health, Government of Bangladesh has declared four newborn targeted interventions as priorities. Management of newborn infection is one of the priority interventions, and the Government is trying to provide high-quality sepsis management at sub-district level health facilities. However, neonatal sepsis management is found to be a challenge for primary level, especially in rural and urban settings. Currently, Health Care Providers (HCP) working at the sub-district health facility are trying to diagnose and manage the neonatal infections with its existing resources. But, many factors play a pivotal role that makes the management of neonatal sepsis more complex at the primary health care setting (Chowdhury et al., 2011). If the sick neonates don’t get access to trained HCP, their chances to develop sepsis in response to infection are more.

The medical officers, nurses, and paramedics are responsible for managing neonatal infection in primary settings. Without their active involvement, it is almost impossible to ensure the newborn intervention properly. However, the health workers who have been working in the sub-district health facilities are facing some barriers and challenges regarding the provision of standard neonatal infection management. These drawbacks need to resolve soon to establish a skilled workforce at the sub-district level who will be more competent regarding managing sick newborn properly. While several studies have addressed causes of neonatal mortality from an epidemiological perspective, there is a dearth of research to know the practices of infection management from the service provider’s point of view. This study was an attempt to understand the practice-based knowledge of health care providers’, information base, and attitude in the management of neonatal infections.

Methods

This is a cross sectional study was conducted over three month’s duration from 1 April 2014 to 30 June 2014. Data collection was done by face-to-face interviews using a semi-structured questionnaire. Two medical doctors conducted the interviews. Data were analyzed by Microsoft Excel & STATA (version 13).

Study Setting

It was conducted in two sub-district hospitals of Tangail district; which is located around 120 km North West to Dhaka, the capital of Bangladesh. Each sub-district has a public hospital known as Upazila Health Complex (UHC). These are the 50-bed primary level referral facilities within the government public health system; together with a catchment area of 500,000 populations. The main occupation of these sub-districts is agriculture, and they also do small business for household income. UHC accepts the referred patient from both the union health centres and community clinics.

Study Participants

Registered medical doctors, nurses, and paramedics who worked in child unit of the hospital in the selected sub-district hospitals were included in the study. A list of registered HCP was taken from the health managers to get the human resource information. A careful search and identification of the participants who have experienced difficulties and challenges with the health system about PSBI were prioritized. HCP were identified through existing networks and in areas where the researcher has already built a rapport. By using convenience sampling, forty-five health care providers (n=45) were selected for the interview. The ratio of the enrolled number of HCP was equally distributed (15:15:15) for the medical physician, paramedic, and nurse.

Study tool

A semi-structured questionnaire containing all the variables of interest were used to collect information about health care provider’s existing technical support base, knowledge, attitude, and practices for rendering essential newborn care. After pre-testing of the draft questionnaires, feedbacks were taken, and final modifications of the questionnaire were done accordingly. In this study, newborn or neonate refers to a baby in the first 28 days after birth and perinatal period relates to immediately before and after the child
birth. Neonatal sepsis or infection is an overwhelming bacterial infection where infections can be found in the blood. ICD-10 is the 10th revision of the International Classification of Diseases, a list of medical classifications developed by the WHO. Integrated Management of Childhood Illness (IMCI) is a systematic approach to identifying and treating the sick children who are under 5 year of age. All the UHC facilities provide 24/7 pediatric emergency services through a medical officer and a paramedic. The duty of nurses is mainly in the inpatient department whereas the paramedics work mostly at the outpatient and emergency department of the hospital.

Ethical Approval and consent to participants

The study was approved by the Ethical Review Committee of the Dhaka University, Bangladesh. Prior permission was taken from the Upazila health managers. All the study subjects were informed verbally about the study design and purpose of the study. They were assured that the information provided by them would not be disclosed. Every participant has enjoyed the freedom to skip any question if s/he wants to. Voluntary participation of every participant has been ensured.

Results

The mean age of the total 45 participants was 36.5 years ranging from 28 to 58. The respondents' average work experience was 15.1 years. And, 42% of the participants were more than five years of experienced in clinical management. The number of enrolled medical physician, nurse and participants were same for this study. Their education level was masters (17.8%), and 48.9% of the participants completed their bachelor's. About 27% of the participants had been working in the same sub-district hospital for more than five years. The numbers of HCP enrolled for this survey from two sub-district hospital were almost equal.

Knowledge towards newborn infection management

When the HCPs were asked to recall the neonatal danger signs, three-quarters of the respondents identified four to five danger signs of newborn (Figure 2). However, most of them were proficient in recalling at least one danger sign of sick neonate. Regarding the IMCI training, only 35.71% received IMCI comprehensive training (Figure 3). However, all the service providers got the orientation of basic health worker package which is a short version of IMCI. We found that all interviewed HCP knows about the treatment of neonatal sepsis. They prefer injection Ampicillin and injection Gentamicin for the first line to treat the neonatal sepsis cases. Injection Ceftriaxone is the choice of drug as a 2nd line antibiotic for the treatment regimen.

Among the UCPs, only a few (21%) were familiar with the international Classification of Disease (ICD-10), and they can demonstrate how it works. Regarding the neonatal infection management guideline, only one-third respondents were found to know about the standard treatment protocol. Rest two-thirds (66%) have little idea about the national neonatal guideline or WHO guideline for neonatal sepsis management.

Attitudes and Perception of the HCP's regarding infection management

The HCPs were asked to demonstrate hand washing or tell us the six steps of hand washing. Half of the respondents did the accurate. When asked about their practices before handling neonates, two-thirds of the service providers reported not to practice antiseptic precaution correctly (Figure 4). From our study finding, we found 83% of the respondents believed cleanliness practices were not maintained adequately at the sub-district hospitals. They perceived “inadequate cleanliness” as a threat for managing neonatal infection and for the prevention of hospital cross-infection at the sub-district hospital.

However, 64% of interviewed HCP consider that introduction of quality neonatal sepsis management is feasible at a sub-district level within the existing workforce and logistical support system. However, more than one-fourth of the HCP believed the sub-district hospitals are not the correct place to manage infants, so they preferred to refer them to the higher facility. Concerning drugs and logistical availability, 34% of the respondents denoted that the essential supply of medicines was mostly adequate. One-third of respondents urged that supply was sometimes found to be available. However, 16% have reported frequent stock out of the drugs and logistics that was needed to manage the neonatal infection.
Table 1: General characteristics of the Health care providers (n=45)

<table>
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<tr>
<th>Characteristics</th>
<th>Number</th>
<th>Percent (%)</th>
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<tr>
<td>Age</td>
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<td>20 - 30 year</td>
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<td>BSc Degree (3 years)</td>
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<td>Paramedics</td>
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</table>

Figure 1: Status of Knowledge on recalling the danger sign among HCPs (n=45)

Figure 2: Status of IMCI, ICD-10 training and management guidelines among the HCPs (n=45)

Figure 3: Perception towards hand washing, existing cleanliness and confidence to treat newborn infection at sub-district level among the HCPs (n=45)

*Hand washing number is not based on 100%

Discussions

This study found that more than one-fourth of the service providers believed the UHCs were not the right place to manage newborn, so they preferred to refer them to a higher facility which corresponds previous communication (Rubayet et al., 2012). Therefore, most of the respondents were confident enough to treat newborn infection at UHCs. It is imperative to make the facility ready to handle newborn to prevent delays. In our country, first access to non-formal treatment is a tradition for the village people, and thus, appropriate management gets delayed (Darmstadt et al., 2009a).

Increased care seeking behavior of patient’s at sub-district health facility may reduce the first delay
After a diagnosis of neonatal sepsis, initiation of prompt management is fundamental. We found that most of the interviewed HCPs have been practicing two antimicrobial drugs, (Ampicillin and Gentamicin), which can be considered as the first-line antibiotic of choice for the treatment of neonatal sepsis in the context of developing countries (Darmstadt et al., 2009b).

It is well recognized that hand washing is essential for the prevention of infection, especially for practicing sepsis management. Around two-thirds of the service providers reported not to practice antiseptic precaution correctly as they were taught during their health education programs. The process is time-consuming by them. Other reasons behind non-practice hand washing: lack of hand washing facility and/or soaps, huge workload in the emergency department, ignorance or lack of motivation of the service providers. Previous studies showed that half of all neonatal deaths occur during the window period; that consist of the first hours to first days of life (Organization, 2014). This window period is crucial for the child survival, hence can be targeted by intervention to prevent considerable newborn deaths (Organization, 2014). Therefore, it is essential to take antiseptic precaution before handling any sick neonates to prevent the contact infection.

Newborn infection-related education and awareness are essential among the HCP for rapid identification and prompt treatment. This study found while infrastructure is adequate there is dearth in the supply of necessary logistics and equipment for efficient management of sepsis cases. Documentation and reporting of neonatal sepsis cases according to ICD-10 are found to be inadequate. Moreover, insufficient staff and lack of skilled manpower to provide the emergency responses have made the sepsis management more challenging at primary setting. Further research is expected on prompt diagnosis and optimal management of neonatal sepsis at the community level to address this issue (Qazi and Stoll, 2009).

In this study, we noticed that nurses and paramedics are working as a frontline workforce to provide newborn care at outpatient and inpatient department. If they felt difficulty, the doctors stretch their skilled hand for aiding. These practices are encouraging because it resembles the task shifting policy being recommended by Simen-Kapeu et al. in managing newborn infections (Simen-Kapeu et al., 2015). For scaling up newborn management, it is fundamental to choose an integrated approach including both the preventive and therapeutic intervention which is appropriate for the families and health care workers (Bhutta et al., 2009).

Though this research has provided new direction addressing the significant gaps for efficient management of neonatal sepsis at selected UHC of Bangladesh, with this single area based and small sample size the generalization of the study results would be difficult. Further large scale multicenter studies would be better to indentify the issues more appropriately

Conclusions

Our study was the first survey in Bangladesh which has emphasized the health care provider’s perspective to understand their skill and practices regarding sick newborn management. Inadequate knowledge on sepsis, lack of motivation to understand or maintain standard protocols and misperceptions with regards to hygiene were found as the main deterrents to provide essential newborn care in the rural areas. Emphasis on capacity building, periodic training, and behavior change communication among the HCP appeared to be required to improve the quality of newborn care.

Significance for public health

Managing neonatal infection at the sub-district level is a great challenge, but provision of quality care is possible by ensuring a trained health workforce and equitable access to the beneficiaries into the health services. The information that we have collected can help us to understand the challenges within the health system from different perspectives of HCPs and to use these perspectives as springboards and inspiration for new ideas, considerations and decisions to acknowledge best newborn practices in rural settings. The policymakers should play a key role to support in-service education, arrange regular training to enhance knowledge, attitude and practices of rural healthcare providers about the newborn care.

Abbreviations


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Competing interests

The authors declare that there is no conflict of interests.

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