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Chapter

Approaches at Community Level for Care of the Preterm Neonates in Low-Income Countries

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Abstract

The survival of preterm babies has significantly improved over the last several decades in the high-income countries because of the availability of Neonatal Intensive Care Units (NICU's) in both large and small hospitals, presence of specially trained physicians, nurses, and other health care personnel with easy access to sophisticated equipment. However, the bigger public health advances that saw improvements in socio-economic status of the populations, improvements in education and sanitation conditions and reductions in malnutrition and rates of infectious diseases were probably the main reasons for this improved survival rates for preterm neonates. Low in-come countries are currently highest bearers of the burden of preterm morbidity and mortality. The current preventive and care interventions do not reach all the neonates and their mothers, the coverage has remained low, access is poor and the quality of care is low. The aim of this chapter is to propose ideas on how the current preterm neonatal care interventions can be adapted for community scale up through community-based health system structures like community health workers to improve survival of neonates who have been delivered from home or after they have been discharged from hospital.

Keywords: preterm, communities, low in-come countries, access, coverage

1. Introduction

Globally, about 15 million neonates are born preterm, the majority of which are in Sub-Saharan Africa [1]. The survival of these pre-term babies depends on which part of the world they are born from [1]. This chapter is meant for neonatal care deliverers in third world economies where subsistence farming managed by women is the backbone, where women engaged in other occupations are scarce, majority of the populations are in the lowest economic quantiles, access to quality education and health services are poor, access to family planning information and services is low and where teenage pregnancy rates have remained notoriously high. Such are the economies that present the highest numbers of preterm births in the global records and yet also present poor health systems with high rates of home deliveries and high rates of perinatal deaths [2]. The knowledge, expertise and the technology required for the preterm babies to survive is limited in these economies.

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Intensive Care Units (NICU's) in both large and small hospitals, presence of specially trained physicians, nurses, and other health care personnel with easy access to sophisticated equipment [3]. However, the bigger public health advances that saw improvements in socio-economic status of the populations, improvements in education and sanitation conditions and reductions in malnutrition and rates of infectious diseases were probably the main reasons for this improved survival rates for preterm neonates [4]. The countries in low-resource regions are currently at different stages of economic growth and health system development and will see similar improvements at some point. But strengthened political will, increased community participation in and awareness of their health are necessary for larger strides in the desired improvements. Strategic research focused on prevention of preterm births and implementation of innovative interventions at the community level is also crucial.

There is need for programmatic innovation to close the gaps in coverage, equity and quality of care left by the health facility based preterm neonatal care interventions and focus on integration and scale up. Health care packages can be linked through the lifetime of individuals (adolescent, woman, mother, newborn and child) and across health levels in the system (at home, primary health care center, district/regional hospitals) using the continuum of care principle.

2. The exaggerated risk of death for the preterm newborns at the community level

Birth and the succeeding few days present the highest risk of death to any newborn in the human lifespan because of the delicate needs of body temperature regulation, glycemic control, and a clean environment to prevent infection. Preterm infants, however, are at an exaggerated risk of dying compared to their full-term counterparts as they are not able to adequately regulate their body temperature, have poor suckling reflex for adequate feeding, and also have poor lung maturity for adequate lung expansion and are therefore, prone to respiratory distress syndrome and infection [5, 6]. These medical complications may be managed with relative ease in the health care facility setting and this makes the difference in survival for the preterm newborns in the different economies.

Most health facilities in the developing world still lack the appropriate technology and skills to save preterm neonates, and it is worse at the community level where the health systems lack community structures for continued care at home after hospital discharge or to access care for those delivered from home. The death of a preterm baby is thus, considered inevitable by both the healthcare system and the families in these economies, yet many of them could be saved with simple interventions that can be rendered and/or continued at the community level [7]. The majority (>80%) of preterm babies are born between 32–37 weeks of gestation and can survive without the need for sophisticated medical care [8]. This chapter aims to highlight the key medical needs of the preterm neonates and how community health structures can be re-aligned to offer simple interventions to support their survival at home in developing countries. It is an attempt to contribute to the efforts towards achieving SDG goal 3 target of reducing neonatal mortality to at least 12 per 1,000 live births [9].

3. The rationale for a community approach in the developing economies

The risk factors for preterm births are ripe in the developing economies where access to health care is poor. Young and advanced maternal age, low maternal body

mass, short inter-pregnancy intervals, gender-based violence, infections such as urinary tract infections, malaria, bacterial vaginosis, HIV, and syphilis are still very common in these countries and are associated with preterm births. Lifestyle behaviors such as excessive physical work, smoking and excessive alcohol consumption have also been associated with preterm births and are common practices in these developing countries [10].

The numbers of preterm births are therefore, higher in these countries and yet survival is poor, as most of these births take place at home, some of the traditional practices of neonatal care simply heighten neonatal infection rates such as application of substances on the cord, the knowledge to detect danger signs is limited and referral pathways are also limited. Well planned and coordinated interventions at community level would argument health system programs to reduce neonatal mortalities in these countries. However, before such interventions are designed and implemented, there is need to assess the contextual newborn care practices at the household level and understand the beliefs attached to these practices. This helps to inform the cultural feasibility and therefore, acceptability of the intervention as well as to define the delivery platform within the local health system.

4. Which of the following preterm neonatal issues can be resolved at the community level?

This chapter is not in any way to replace actions/interventions at the health facilities in any country but to emphasize preventive, health promotive and essential care actions that are possible at the community level to increase survival in contexts where access to health care is poor. It is, therefore, important for it to be clear to the reader that preterm neonates have multiple issues, some of which may not be alienable at the community level. Some of these issues are pointed out here for emphasis, and it is prudent that each case is assessed carefully and independently.

1. *Severe infections*: Most preterm neonates will die once they get severe infections; therefore, prophylactic antibiotics may be necessary for all preterm neonates.

2. *Respiratory Distress Syndrome*: Preterm neonates born before 32 weeks of gestation have immature lungs that lack surfactant in the alveoli and thus have poor lung expansion. Antenatal corticosteroid injections to women in preterm labor has proved helpful in reducing the risk of RDS [11].

3. *Jaundice*: The preterm neonate's liver is not able to metabolize bilirubin adequately and the brain is at higher risk of damage as the blood–brain barrier is also poorly developed to offer protection.

4. *Intraventricular hemorrhage*: This is the most common cause for brain damage and is often related to the RDS and hypotension.

5. *Necrotizing enterocolitis*: Formula feeding seems to increase the risk tenfold as opposed to those neonates who are breast fed.

6. *Anemia*: This may show up a few weeks after birth because of delayed red blood cell production by the immature bone marrow.

5. The medical and socio-economic challenges while caring for preterm newborns at the community level

Developing countries can reduce their neonatal mortality rates significantly by offering appropriate care to preterm neonates through regular breast feeding, optimum body temperature maintenance, cord, and skin care, as well as early detection and treatment of infections. However, multiple technical, social, and economic challenges exist which might render these elements of care difficult at the community level.

5.1 Care of pre-term babies at the community level may be complex and stressful for parents compared to at the health facility with the support of the health care providers and availability of appropriate equipment

Parents and care takers at home not only require the knowledge about the needs of pre-term babies over and beyond those of the term babies, what medical complications to anticipate and how to prevent them but they also need social structures to support them provide the care to their babies and help with other domestic chores.

Some of the difficulties may vary according to context influenced by culture and traditions. Kangaroo mother care (KMC) for example, has promise to support preterm neonates at home and prevent occurrence of most of the above medical complications, however, its practice has remained low [12]. The traditional way of carrying neonates at the back makes KMC an odd intervention and shameful for mothers to practice [13]. Most communities are aware of the need for warm care for neonates and already have traditional ways of providing it e.g., putting a lamp or a charcoal stove in the room where the neonate sleeps, smearing the body of the neonate with special oils etc. This has made it difficult for KMC to receive social approval in such communities. It has been reported in some studies that community members have accused mothers practicing KMC of using their chests to hide stolen property [14]. This kind of stigmatizing comments from the community members does not only make the mothers fear to practice KMC but also limits the participation of the male partners. It has also been reported that close relatives may generally support and help mothers practicing KMC with household chores, but they are likely to overly subject the mothers to a lot of questions.

Certain traditional practices and norms increase risk of infection among preterm babies such as many care takers in the community not willing to wash hands before handling the neonates, large number of people visiting the mother and the neonate insisting on carrying the baby without washing the hands. Families, therefore, go through a lot of psychological stress from forces within the communities that takes away their confidence while taking care of preterm neonates. The healthcare systems must address this through providing adequate and coordinated information and education.

5.2 Gender roles place mothers of preterm babies in responsibility of household chores with limited assistance from the male partners

Beyond the complexity of detecting medical complications and offering the care needed to prevent them, the mothers in the developing world have additional burden placed on them by gender norms within the societies. It has already been noted that the care for preterm neonates is labor intensive and time consuming and yet in most settings gender roles place the mothers in positions where they receive minimum assistance from their male partners towards household chores. The mothers must cook for their husbands and the other children at home, clean up the house, produce food from the gardens besides having to look after themselves [15].

5.3 Feeding challenges as pre-term babies have a poor suck reflex and insufficient suck-swallow coordination

Pre-term neonates have a poor coordination of the hunger-satiety cues, they also tire easily at suckling and may sleep off without effective feeding [16]. Unfortunately, their mothers do not usually recognize this challenge especially when the neonates tire and sleep off, the mothers tend to believe that they are full. In some communities, mothers use undesirable feeding options when the neonates are not able to suckle adequately such as giving sugar water instead of expressed breast milk [17]. Different breast-feeding methods for these pre-term neonates needs to be taught to their mothers and regular close monitoring implemented.

5.4 Health systems failure to create consistent awareness and education on pre-term neonatal care at the community level

The health care systems have no clear strategies to promote preterm neonatal care at community level, for example, most mothers learn about KMC from health workers for the first time only after giving birth in the hospital [13]. Preterm labor and pre-mature neonates are not subjects discussed with the mothers during antenatal period. Peer -to- peer information sharing has been noted to be a major source of trusted information that most mothers relied on to care for pre-term neonates [13]. The mothers are, therefore, not mentally ready about what to expect and feel overwhelmed with anxiety once confronted with the demands of the preterm baby. Health systems that have community health structures such as village health teams (VHTs) or community health workers (CHWs), these have program specific trainings in most settings and pre-term neonatal care at community level is usually not one of the priorities. For example, the personnel are trained as community drug distributors for childhood illnesses, breastfeeding supporters, and as safe motherhood volunteers while others promote malaria prevention. Most health systems lack evidence informed policy and standard guidelines for pre-term neonatal care at the community level.

The education needs of parents being discharged from hospital need to be carefully assessed to empower them to take care of pre-term neonates at home and be provided with a discharge plan based on the needs of the pre-term neonate, their competencies and availability of resources for care. These educational needs are likely to change over time to information regarding growth and development. Health systems, therefore, need to design and adapt parental support structures at the community level that are dynamic at the different stages of baring a pre-term neonate.

5.5 Financial constraints for professional home care and health promotion

A structured coordinated home care by health care professionals would provide parents an opportunity of support in their own physical environment making use of their own social support networks. However, the human resources to provide this and the supplies required is often lacking in the developing world.

It is difficult for most families in the developing world to afford materials that are required for the desired practice especially among the poorest communities. They often lack the basic supplies such as warm clothes for keeping the baby warm, no adequate clean water and sanitation facilities at the homesteads, as well as inadequate maternal nutrition often compounds the situation. In one study, mothers reported lack of funds to buy fuel (charcoal and paraffin) and oil to smear the baby or for accessing healthcare when the neonate gets sick [18].

Health systems would need to make commitments for an institutionalized approach of home care for pre-term neonates and act on the roles and obligations towards achieving agreed goals and rights. Decisions and actions towards financial obligations need to be based on evidence and rights. There is also be need to have clear accountability frame works for any financial commitments for home based care for pre-term neonates including institutionalized monitoring and evaluation systems that facilitate learning and progress.

6. Resources available at the community level to support care of pre-term neonates in low-income countries

6.1 There are traditional birth attendants (TBAs) in communities who continue to attend births from home

Mothers in rural areas in the developing world continue to rely on TBAs for assistance at birth and advise on postnatal newborn care. The knowledge, attitudes, and practices of these TBAs needs constant evaluation by the health systems. It has been demonstrated in some studies that mothers prefer to follow the tradition and are heavily influenced by these local TBAs and family pressure [19].

6.2 There are community-based health structures composed of voluntary community health workers (CHWs) monitored by the health systems in most developing countries

As already stated above, most of these community structures are established for specific programs. Integrating the knowledge and safe practices for newborn care into the existing activities of the VHTs/CHWs can stimulate a structured newborn care at community level under the supervision of the health systems. There has been successful home-based neonatal care programs [20], and this can be scaled up for preterm neonates.

6.3 There are locally known signs to identify pre-term neonates

Community members such as Traditional birth attendants (TBAs) can correctly identify preterm neonates with features such as 'baby at birth is very small', 'not able to suckle', 'skin is wrinkled' and 'inability to open eyes at birth [21].

6.4 There is some knowledge about how to look after pre-term babies

The need to give the pre-term babies extra-care is known to many community members such as keeping them warm, encouraging adequate feeding and keeping the environment clean. For example, warmth is generated from the different sources in different societies including covering the babies with many clothes, lighting charcoal stoves under the bed where the baby is laid and providing hot water jerrycans [22].

7. Essential preterm prevention and care packages at the community level in low-income countries

The essential neonatal care packages exist in literature but there is a gap between this wealth of knowledge and practice. There is need to adapt the interventions and

care packages tested in randomized trials to local settings especially when strongly held beliefs and cultural barriers exist against the scientific mechanisms of the interventions. The extend of the adaptation may depend on survival benefit and affordability of the intervention.

7.1 Prevent preterm births

Preventive strategies in low-income countries should focus on risk reduction and this includes preconception interventions through to interventions during pregnancy. The interventions need to be packaged and delivered through coordinated community health structures involving trained CHWs and VHTs. During preconception period, communities need to be educated and empowered to improve adolescent and preconception nutrition, strengthened family planning information, education and methods delivery system at community level; prevent gender based violence, prevention, and management of sexually transmitted infections (STIs) at community level, preventive strategies for control of malaria infections through use of insecticide treated mosquito nets and cessation of smoking and excessive alcohol consumption.

During pregnancy, mothers need to be supported, monitored, and supervised by CHWs to attend ANC through multiple home visits to ensure targeted care for women with increased risk for preterm birth.

7.2 Community -health facility linkages to ensure health facility births under skilled care

Access to health care is a major obstacle for many women in developing countries. Women and their families have been encouraged to have a birth preparedness plan which needs to clearly identify health facility for birth, means of transport to the facility, a skilled health care provider, a companion from home, financial support, clothes to provide warmth for the neonate and person(s) to continue giving support looking after other children while away. This preparedness should be monitored through the community health structures such as the village health teams (VHTs) or community health workers (CHWs) who need to be facilitated to conduct home visits to all pregnant women in their catchment areas.

Deliveries under skilled care is crucial to correctly identify preterm neonates, ensure their birth weights are determined, early and exclusive breast feeding is established, and resuscitation done if required. The referral pathways need to be established through linkages with the VHTs and/or CHWs for mothers and neonates who have delivered from home.

7.3 Thermal care

Community health structures can be organized to VHTs and CHWs to support women through postnatal home visits to establish adequate thermal care for their preterm neonates. Every neonate needs thermal care by simple actions such as drying and wrapping, warming up the room the neonates are in, covering the head with a cap, delaying the first bath, and using warm water for bathing [23]. Preterm babies will require kangaroo mother care which involves placing the preterm neonate on the chest of the mother or other attendant for a direct, continuous skin-to-skin contact to provide stable warmth and encouraging exclusive breast feeding. These techniques can be taught to mothers and other family members and reinforced through regular supervision and monitoring by VHTs/CHWs.

7.4 Early breast feeding

Breast milk is particularly important for preterm neonates not just for nutrition but for their immunological and neurological development. Preterm neonates have ineffective suckling reflex that leads poor breast feeding; they need support with expressed breast milk fed using a cup or a spoon. Again, community health structures established through VHTs/CHWs can support mothers to establish early and effective breast feeding for preterm neonates through education, supervision, and monitoring.

7.5 Hygiene at birth and after birth

Preterm neonates have a heightened risk for sepsis usually because of poor cord care and unhygienic conditions during and after birth [3]. Mothers continue to have home births under unhygienic conditions; health systems need to acknowledge this and be able to provide clean birth kits at community level for births that are likely to take place at home. Awareness needs to be created among mothers and close relatives about hand washing prior to handling a neonate and avoid separating mother and baby especially when there is no need.

Different communities in developing countries apply different substances at the cord and different cultural beliefs are attached to the practice. Chlorhexidine has been proven to be effective in preventing neonatal cord sepsis and there are suggestions that a policy of using it at community level might eliminate use of harmful products.

7.6 Resuscitation

About 5–10% of all babies will need support to initiate breathing at birth and fortunately 80% of these can survive with just basic resuscitation with a bag and a mask [23]. Traditionally this has been a function of health facilities but whether resuscitation training can be conducted to birth attendants plus CHWs at community level to equip them with skills to identify infants with apnea and how to stimulate and perform basic manual ventilation needs further study. Considering that many mothers continue to give birth at home, basic ventilation with bags and face masks at community level is a skill worth considering at that level.

8. Strategic research agenda

Despite the wealth of information on the risk factors for preterm birth and care interventions in the health facilities, there is need to further study how these interventions can be adapted for difficult settings or at the community level. Effective interventions such as KMC are not practiced widely at community level and factors that affect its utilization at scale needs to be understood. Strategic implementation research focused on adapting existing interventions to specific contexts with an aim to increase coverage, reduce cost and improve access. Research can also focus on developing new approaches including behavior change interventions to prevent preterm births, calling on the communities to their moral obligation to participate in improving their own health.

Community members need to be mobilized, educated and awareness be created in organized groups such as women groups, youth groups etc. The modalities for these mobilization strategies need to be studied. The rational choice and the motivation for individuals to participate in a collective behavior change program

might be influenced by many factors including social trust, relationship networks, and social norms etc., that can promote collective social response [24]. Individuals can be pushed to change their behaviors and be forced to participate in collective community responses after personal constraints and experiences or such behavior change can be a result of external pressure and supervision from social norms [25]. Some studies show that government support and guidance can also influence individuals participation in collective actions through organizing them, policy guidance and financial support.

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