

# **Neonatal death: any role for development interventions?**

(A Pilot study)

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## ABSTRACT

**Objective:** The study aimed to explore whether or not the women focused development interventions have any effect on neonatal death.

**Methods:** The qualitative research method was used. Case study of cases (died within 28 days) and controls (live children and taken from the nearest door of cases) who born during the year 1999-2000 was the main method employed. ICDDR, B surveillance database provided the sampling frame.

**Results:** The antenatal care of mothers and maternal nutrition carried out an important role in reducing neonatal death. On the other hand, physical abuse and emotional stress, and congenital anomalies are associated with increased risk of neonatal death. It is noted that women who were members of any government and non-government organization including BRAC were better exposed to antenatal care and nutrition as well as have had less physical abuse or emotional stress. Nevertheless, the study did not find any effect of mother's reproductive history, and birthing and newborn care on neonatal death.

**Conclusion:** Regular medical check-up, following rules and regulations of antenatal care as well as the development intervention may have an influence over reduced trend of neonatal death over the year. In order to prove this hypothesis, a quantitative study, such as, a nested case-control study can be performed. To address whether or not BRAC's interventions have any influence, the study may, therefore, be performed in both BRAC and non-BRAC area.

## **Background**

It is noted that marked reduction of under-5 mortality are due in fact to decline in child mortality (1). The estimated neonatal mortality rate in Bangladesh during 1995-99 was 42 per thousand live births that had fallen by about 33% over the past ten years (1). Age and parity of mothers, parental education, sex of child, and area has found to be significantly associated with this reduction (2,3). A number of studies in Bangladesh have shown whether or not service delivery components have any influence on reduced infant and child mortality rate (3,4). In Matlab, it is evident that women's participation in development interventions has a positive impact on child survival as well as health equity (5). Focusing on under-five deaths in Matlab, neonates seem reasonable since they accounted for about half of these deaths. Specially, immaturity/ small for date, prematurity, acute lower respiratory infection (ALRI), neonatal tetanus, and unspecified neonatal deaths are the major killer. Therefore, it is interesting to know whether or not the women focused development interventions have any effects on neonatal death. An exploratory study, thus, has been performed to detect the underlying factors that can explain such consequence at the individual level.

## **Objective**

Identify certain determinants of neonatal death.

## **Methods and Population**

The study was conducted in Matlab and utilized the qualitative research method. Data was collected from one village of ICDDR, B non-intervention area. Case study was used as a tool for data collection. Subjects for the study were mothers of cases and controls. **Cases** were neonates born during the year 1999-2000 and who died within 28 days. **Controls** were live children born during the same period and taken from the nearest door. All births taken place in the study area during the year 1999-2000 provided the study base. 6 cases and 6 controls were selected randomly from the DSS registers. However, one case could not include in the study as the family was migrated to another village.

The interview focused on mothers' reproductive history, antenatal check-up, and major illnesses during antenatal period, family planning history, birthing and newborn

care, domestic violence and emotional stress, and congenital anomaly. The researcher and a female interviewers recruited from the study area was responsible for data collection. Both sat together at night to check if there was any inconsistency and to write the whole interview clearly and thoroughly.

The interviews were coded line by line, and concepts and categories were identified. The analysis tried to correlate factors (mothers' reproductive history, antenatal check-up, maternal illnesses, family planning methods, birthing and newborn care, domestic violence or emotional stress, and congenital anomalies) with increased or reduced trend of neonatal death.

### **Definitions used in the study**

**Neonatal death:** Neonatal death defines as death of a newborn on or before 28 days of life. Of these, who died on or before 7 days is called early neonatal death.

## **Findings**

### **Dead neonates**

#### **Characteristics of parents**

Respondents were mothers of the newborn / children. They were in the age group of 21-30 years. The education level ranged from fourth to eighth grade. All of them were housewives. Among 5 mothers, only one was BRAC member for 5 years and left BRAC two years ago. Currently she is a member of both ASA and BRDB, her husband has also joined BRDB. Two fathers were illiterate and the other three were literate, the education level being second, sixth and twelfth grade respectively. They had different types of occupation like business, rickshaw pulling, looking after own land, etc.

#### **Causes of neonatal death**

Mothers perceived that their babies died due to *ulga* which is an evil spirit. The incident of illness caused by spiritual being is known as *alga dhora*. *Ulga* comes through bad wind and attacks children in different form of illnesses. *Kabirajs* and neighbours also perceived the same. According to one mother "I had swollen face, foot, hand and

abdomen (oedema) while I was 5 months pregnant. The baby, however, was delivered before the expected date of delivery. I tried to feed her my breast milk. Initially, the baby was able to suck but after a while she had convulsion. On second day, the frequency of convulsion had increased and she could not suck the breast milk. My husband called a *kabiraj*, he treated her with sanctified water and herbs. Nevertheless on 3<sup>rd</sup> day, she died." The other resultant causes of *ulga* for neonatal death were: excessive bleeding from nose and mouth, very severe form of low birth weight (LBW) and resulting infections, pneumonia, and bad wind. Mother's explanation for the LBW was "I could not take enough food since my 5<sup>th</sup> months of pregnancy. As a result, the foetus did not get enough nutrition to grow-up and became very small. Consequently she got generalized infections. One day after her birth she also had ulceration inside her mouth and could not drink milk at all. Even it was not possible to feed her any medicine to get cured off." They also made clear pneumonia in the form of *ulga* was "the first day the baby was in good health. The next day the baby was reluctant to breast-feeding. There was also something like saliva coming out from mouth and nose. I took her to a homeo doctor. Doctor diagnosed it as *ulga* and gave her some medicine. But there was no improvement. I thereafter took her to a *kabiraj*, he also diagnosed it the same and treated with incantation and religious water and oil. But her condition became gradually deteriorated, chest became indrawn and baby became lethargic. I then took her to a medical doctor and he diagnosed it as pneumonia and advised to move her to hospital immediately because she needed artificial oxygen inhalation. The baby, however, died on the way to hospital."

### **Determinants for dead neonates**

#### *Mothers' reproductive history*

Each of the four mothers had two children. One had five children, two of whom were dead. Three babies died at early neonatal age and two died at late neonatal age. Two mothers had one year and two had five and six years birth spacing. The mother having 5 children had birth spacing of 1, 2, 1 and 3 years respectively.

### *Antenatal check-up*

None of a mother had received antenatal check-up except the one who had been a BRAC member two years before. Majority did not have any knowledge about antenatal check-up and its importance. In addition, they did not follow any rules of antenatal period, such as, did not take adequate diet and TT injection. The woman having oedema once visited a doctor for her problem. The doctor detected that she had very high blood pressure along with oedema and asked her to do regular antenatal check-up especially to check the blood pressure and not to take salty diet. However, she did not follow doctor's advice. One woman stated, "If I know that antenatal check-up is good for child's health, then I must do that whether or not I am able to have a meal."

Some women perceived that there has been a positive association between antenatal check-up and reduced neonatal death. "If I did the regular antenatal check-up, I would then be able to know the growth rate of my foetus. If I knew that my foetus did not grow up properly and took more nutritious diet, perhaps the baby might not die from malnutrition / LBW." "Sometimes I heard from BRAC's *pushti apa* about antenatal check-up while I was in my father's house during pregnancy. They said me if I checked weight every month, I will then be able to know the growth of my baby. But I did not give any importance to them because haven't had any problem. I could not understand why my baby had died from pneumonia?"

### *Major illnesses during antenatal period*

Women did not have any major illnesses except coughing, common cold and mild fever.

### *Family planning history*

Three mothers did use family planning method in order to have delayed pregnancy and birth spacing which is necessary for good maternal as well as child health. Two mothers never used any method because of family pressure to have more children. However, they did not find any relation of using family planning methods with neonatal deaths.

### *Birthing and newborn care*

All women have delivered at home by TBAs or relatives like grand mothers, etc whom did not receive any formal training. The birth attendants cut the umbilical cord with new

or old blades. One baby was born at term and four were born before term. The babies born before term were malnourished and LBW with respect to that date renowned as small for date. Mothers did not have any complications before, during and after delivery.

The babies were bathed and wiped and transferred to mothers' lap. No one fed her baby the colostrum except one. "The first day I could give my baby colostrum and breast milk. However, from second day she was not able to suck my milk. Therefore, I fed her sugar water, master oil, honey, etc. As she had fever (pneumonia/*ulga*) she needs more warm cloths than any normal baby." The first feeding was sugar water (*misrir pani*), honey and master oil. In most cases mothers could not feed their babies breast milk due to some reasons, such as, "my baby cannot suck my milk as she was weak"; "because of *ulga* the baby cannot suck my milk at all, if I tried she cried very loudly". Mothers fed their babies cows' milk, water, *misrir pani* etc. The body temperature has been maintained by wrapping babies with warm cloths (*kantha*). Small for date babies needed more warm cloths than any normal baby to maintain body temperature. "Just after birth he had shivering and needed more towel and *kantha* in order to maintain his body temperature."

#### *Domestic violence and emotional stress*

The majority of women have had some sorts of physical abuse in their lives. Conversely they haven't had any direct trauma during pregnancy but had emotional stress because of quarrel, bad relations and many other family matters. Their husbands beat them before and after childbirth. The BRAC member said, "I do not have any history of domestic violence in my family. After being a member of BRAC, our husband-wife relationship had been improved as a result of improved economic condition."

However, apart from one, women did not think that domestic violence or emotional stress have any influence over neonatal death. "There might have a relation of it with the neonatal death. Because of quarrel and unrest situation in my family, I could not take enough food and adequate rest while I was pregnant. Thus the foetus could not grow up properly in my womb. As a result he was very small and weak and had died one day after birth."

### *Congenital anomaly*

Four women found a positive association between congenital anomaly and neonatal death. "There is less chance to alive a crippled baby. Because a crippled baby is always malnourished and weak and difficult to continue the life."

## **Live neonates**

### **Characteristics of parents**

The mothers were in the age groups of 23-32 years. Two were illiterate and others had education level of third to eighth grade. All of them were housewife. Two mothers were BRAC member. One was a member for 7 years and the other was for five years three years ago. In contrast, fathers were literate apart from two, having education level from third to tenth grade. They have had different types of occupation like business, regular job, day and skilled labour (mason), car driver, etc.

"I have learned from BRAC how economically arranged a family. Before I joined BRAC, I have only one room to live in, have no land and have to go without food while my husband cannot earn money. BRAC has given me money concurrently that helped me taking land in mortgage for harvesting and building another room to live in." "After becoming a BRAC member, I have been aware of my life and how it can be improved and healthy."

### **Determinants for live neonates**

#### *Mothers' reproductive history*

Parity did range from two (four women) to five (two women). Birth spacing varied from less than one year to 7 years (11 months, 1 year, 3 years, 4 years, 4.5 years, 7 years). The women having two children have had all living children. The woman having 5 children had bad obstetric history, among 5 children, 3 (first, second and fourth one) died at the age of 3 days as a result of premature labour which meant delivery before 37<sup>th</sup> week of pregnancy. The mother delivered these 3 children at 7 to 8<sup>th</sup> months of pregnancy. The birth spacing of this woman is around one year (10 to 11 months). In addition, the youngest one had suffered from pneumonia. The mother perceived it as *ulga*. The neighbours and *kabiraj* also seemed it as *ulga*. Mentioning her own obstetric

history, one woman said, "Allah blessed me two children, both are alive. The last one is 7 years younger than the first one. I haven't had any complication during the intra-partum period because I followed doctor's advice during the pregnancy period."

#### *Antenatal check-up*

All mothers did the regular antenatal check-up while they were pregnant either in direct or indirect way. The direct antenatal visit means mothers go to the doctor regularly for antenatal visit. The indirect way denotes mothers had to do their first visit due in fact to other reasons like pain in abdomen, fever, common cold, jaundice, etc. Thereafter, they visited doctors primarily for antenatal check-up following doctor's advice during first visit. "I had been known from a doctor why I should do antenatal check-up and why I should take TT injection." All of them took nutritious diet, such as extra rice, more vegetables and water, etc, and took two doses of TT. Doctors also advised them not to do the wait bearing works, however, sometimes it was not possible to follow. Apart from two (BRAC members), all mothers did the indirect antenatal check-up. BRAC members did do the check-up from BRAC's nutrition program (*pushti apa*) or govt. satellite clinic (SC). "While I was pregnant, I visited the *pushti ghar*, checked my weight and took food from *pushti packet*. If mother takes adequate diet, the baby will be healthy and less chance to attack by diseases and death."

Mothers perceived that neonatal death rate would be reduced if women do the antenatal check-up regularly. Because mothers only then be able to know what they should eat, whether or not babies are growing in a precise way as well as the position of baby, what they should do if any complications arose, and what should be the place of delivery. One woman said, "My three babies had died before this alive baby. If I would aware of it before and did the antenatal check-up regularly, perhaps my elder three children might not be died." One BRAC member stated, "Healthy mother usually delivers a healthy child. If the healthy baby is born then there is no fear to death of a neonants. Antenatal check-up helps to deliver a healthy child if mothers follow the rules and regulations."

### *Major illness during antenatal period*

Mothers did not have any major illnesses during their antenatal period. According to them, some minor illnesses they had like mild fever, cough, gastric problem, etc.

### *Family planning history*

In order to avoid early pregnancy, one woman had used family planning method from the beginning of her marital life. One woman discontinued the method as a result of her husband's objection. Four women had never used any contraceptive method. The late pregnancy, too long birth spacing, living away from husband, unwanted side-effect, harassment by mother-in-law and frequent death of children also discouraged them from using any contraception. "My three babies had died at the age of 3 days, therefore, it was not possible to use any method." All mothers perceived that there was no relation between neonatal death and use of a contraceptive method. If there is any, it is a superstition.

### *Birth and newborn care*

All children were born at term by TBAs (*dai*) and relatives (*chachi shashuri*) in home who did not receive any formal training. They cut the umbilical cord with new blades, nonetheless, it was not the safe delivery which meant the TBAs did not use the delivery kits i.e. they did not cut and tie the umbilical cords with sterile blades and threads. Every mother had blessed with a healthy baby. Neither mothers nor newborns have had any complications during and after delivery.

Care of newborns had been done very cautiously. After cleaning, the baby was wrapped with a piece of warm cloth (*kantha*) and moved to mother's lap. None of a mother fed her baby colostrums except two who were BRAC members. The first feeding was sugar water (*misrir pani*) or honey. After a while some mothers fed their babies cow's milk because of lacking breast milk. To protect and maintain the body temperature, all babies were wrapped with pieces of warm cloths.

### *Domestic violence and emotional stress*

Neither they have any history of violence by husbands nor by any other family members. "I have a nuclear family. I do not have this kind of problem in the family. My husband is doing a job in Dhaka. I am happy with my two children." Nevertheless one

mother stated her own story to become irritated / annoyed by her mother-in-law, "all the time she tried to convince my husband to divorce me and to marry another woman since my elder three children had died one after another. My husband, however, did not hear to her. I could not explain you how much it causes me worried. Because of the psychological disturbance I could not eat and even sleep properly. In my previous three pregnancies I did not know about the antenatal check-up. As I did the antenatal check-up regularly, I could save the life of my last child."

Mothers had found a strong association between neonatal death and domestic violence. "There are many husbands, fathers and mothers-in-law beat their wives or sons' wives while they were pregnant. A foetus may injure during that time. Consequently the baby may die at any time after birth." Another explanation was "If there is any persecution or harassment by a mother-in-law or a husband, or any other form of emotional stress, how a pregnant woman of that family take adequate diet and rest! Therefore, the growth of the foetus has been hampered and the baby become low birth weight, and will be affected by many diseases and complications and will die 1 to 2 days after birth." One BRAC member said, "After being a BRAC member, I never been abused by husband. Because I am getting money from BRAC and giving solvency to my family. I do believe a relationship between neonatal death, and domestic violence and even emotional stress." One woman stated as she did not have any form of physical and psychological abuse by her family, she did not think that this had any influence on neonatal death.

#### *Congenital anomaly*

Majority of mothers assumed a relation of congenital anomaly with neonatal death. A woman said, "There is less chance to live of a crippled baby. Because a crippled baby is always a malnourished baby." If a pregnant woman has cut fish or anything else during a lunar or solar eclipse, the baby of that mother then be a cripple." Two women didn't have any knowledge whether or not there was any association between neonatal death and congenital anomaly.

### **A case study of neonatal death (BRAC member)**

Nasima Akhter, 32 years of age, has six years of schooling. Her husband has no formal education and his main occupation is business (making and selling rickshaw and bicycle). She has five children. The oldest son had died from *alga* 2 to 3 hours after his birth. She had three live children, the birth spacing of whom is 2 and 6 years. Last year my youngest daughter was born but had died after 8 days. This daughter also suffered from *alga* transmitted from her mother. She got this disease during her pregnancy as she went out at any time of noon and evening during her pregnancy. The traditional healers also perceived the same about her child's death.

Seven years ago she joined BRAC and was as a BRAC member for 5 years. "I left BRAC two years before since their (BRAC's employee) behavior seemed very bad. All times they did chastise. They said, 'why don't you give us money back? We see you to do a lot of things and have no money while your time to pay off the debt.' Currently both my husband and me are the members of BRDB.

However, I have got prosperity in many aspects of my life after joining BRAC. The financial condition of my family as well as myself has been improved. Once being a BRAC member, I could buy land, keep alive by harvesting in that land and able to make home to live in. There are some societal improvements as well. Now a day, I could go out, talk to others and be aware of many things such as health and family planning, which was not possible before.

Her youngest child had died at the age of 8 days. "While I was pregnant, once my father was sick. I went to see him at any time in evening or noon. I did not bother what time it is. Subsequently *ulga* did affect me. During the intrapartum period, this *ulga* was with me. After the childbirth, I went out for micturition at noon and became senseless. My husband called a *kabiraj* (faith healer) to treat me. He treated me with religious oil and water, and gave me an incantation. Thereafter, the *ulga* has been transferred to my daughter."

While she was pregnant, every month she did regular antenatal check-up at satellite clinic. Health workers from Govt. hospital do arrange a satellite clinic in a suitable place of the village in each month. They advised me to have extra food and not

to do weight bearing work. But she has had to do that for the family. She took two dose of TT during antenatal period. "If we do the antenatal check-up regularly, we then able to know whether or not the foetus is in right position and gains its growth. If anyone do the regular antenatal check-up and follow the rules, the neonatal death rate would then be decreased."

She doesn't have any major disease, injury and domestic violence during the pregnancy period. This is a nuclear family. Their husband-wife relationship seemed good. According to her "Violence during pregnancy may have relationship with maternal death, not with neonatal death." She stated an event from next village "a woman was beaten by her husband at 7 months of pregnancy. Her husband kicked her. She fall down and had died. Perhaps the foetus would die later on since the mother is dead. But there is no direct relationship with the baby."

The baby delivered at home by an untrained *dai*. Had no complications during her delivery. She had labour pain for 4 hours. The baby was full term (10 months and 10 days) and was larger than a normal baby. In order to avoid cold, the baby was swept off with a piece of cloth and placed into mother's lap. (She had no idea about mother's skin contact to maintain child's body temperature). The next morning the baby was bathed by warm water. "But the problem was she could not able to suck my milk, all the time she cried except during sleeping. She took only cow's milk till death. I could not feed her my milk because of *ulga*. If I tried to feed her, she cried very loudly." Just after her birth she fed master oil and honey. They have no idea about colostrum.

This was an unsafe delivery since the umbilical cord was by a new blade and no other technique of sterilization was undertaken. .

## **Discussion and Conclusion**

In reference to the mothers' belief and practice, the study has found that antenatal care of mothers and maternal nutrition perform an important role in reducing neonatal death. On the other hand, physical abuse and emotional stress, and congenital anomalies are associated with increase risk of neonatal death.

**Antenatal check-up:** The study findings revealed that all mothers of living neonants did do the regular antenatal check-up either direct or indirect way and followed doctors'

advice during antenatal period. The BRAC members have done the direct antenatal check-up that denotes they are aware about antenatal check-up and receive it from SC and BRAC'S nutrition program. Whilst no mother of dead neonates did do that except the one. Given the importance of antenatal check-up on neonates' and mothers' health, it is assumed that neonatal death rate would be reduced if antenatal care service is integrated to the BRAC's system in Matlab. As two mothers among living neonates and one mother among dead neonates were BRAC members, and the mother of the dead neonates was aware and did regular antenatal check-up, it is hypothesized that BRAC's rural development program may have an indirect influence on reduced trend of neonatal death. Nevertheless, it is somewhat difficult to conclude because of small numbers. The hypothesis can be accepted or rejected by doing a quantitative study.

**Small for date and low birth weight:** Almost all dead neonates were small for date and premature whereas the living neonates were healthy. According to mothers, maternal nutrition is important in order get adequate foetal growth and to prevent LBW, premature labour, and small for date. Both awareness and practice, however, is necessary in this regards.

**Physical abuse and emotional stress:** Mothers of dead neonates have emotional stress during their pregnancy compared to live neonates who did not have any. Nevertheless, majority of mothers have found that neonatal death might be a consequence of domestic violence and / or emotional stress through an intermediate indicator i.e. maternal malnutrition. BRAC members spoke about decrease emotional stress and improve relations with their husband as their economic condition improved. This, therefore, indicates brac's intervention may have an indirect influence over neonatal death.

**Congenital anomaly:** Mothers initiated a positive association between congenital anomaly and neonatal death. Congenital anomaly act through foetal malnutrition and weakness.

It is concluded, therefore, regular medical check-up, following rules and regulations of antenatal check-up as well as the development intervention may have an influence over reduced trend of neonatal death over the year. In order to prove this hypothesis, a quantitative study design, such as, a nested case-referent study can be performed. Alternatively, a prospective cohort study can be designed. To address whether or not BRAC's interventions have any influence, the study may, therefore, be performed in both BRAC and non-BRAC area; and in all 4-study area.

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