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## Analysis of postpartum complications in relation to selected delivery characteristics in rural Bangladesh

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### Abstract

**Objective:** In this paper an attempt is made to identify the possible risks of occurring postnatal complications among the rural women of Bangladesh in relation to their selected delivery characteristics. **Methods:** Longitudinal data on Maternal Morbidity in rural Bangladesh, conducted by the Bangladesh Institute of Research for Promotion of Essential and Reproductive Health and Technologies (BIRPERHT) were employed in this study. A total of 1020 pregnant women (pregnancy less than 6 months) were interviewed. **Results:** From the bivariate analysis, it was observed that women who had assisted deliveries had a higher risk of having pelvic pain, cough or fever for more than three days, headache and other complications during postpartum period compared to those who delivered normally. Deliveries attended by trained personnel reduced risk of having cough or fever for more than three days and weight loss compared to those deliveries attended by untrained personnel. The place of delivery is significantly associated with various postpartum complications. Complications at the time of deliveries significantly increase subsequent complications during the postpartum period. Similarly, the duration of labor seems to have an association with postpartum complications as well. **Conclusions:** There is limited but growing evidence suggesting that complications of delivery and postpartum period are more frequent in the rural areas of Bangladesh. Results from this study may provide information to the policy makers and health planners to target, plan, develop and deliver of maternal health services to those in greatest need.

*Key words:* Delivery Complications, Postpartum Complications, Assisted Delivery, Place of Delivery,

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## **Analysis of postpartum complications in relation to selected delivery characteristics in rural Bangladesh**

### **Introduction**

Though the safe motherhood initiative has been given priority in recent years, maternal morbidity and mortality still remain a major public health issue in most developing countries<sup>1</sup>. It is estimated that 1600 women die worldwide each day as a result of problems during pregnancy or childbirth and the greater proportions of these deaths occur in developing countries<sup>2-3</sup>. A large proportion of these deaths are preventable by appropriate measures through the periods of antenatal, delivery and postnatal care<sup>4</sup>. Complications of pregnancy and childbirth are still the leading causes of death and disability among women of reproductive age in developing countries<sup>5</sup>. Researchers emphasized more on the maternal morbidity and mortality that occur during ante partum and intrapartum periods. However, as a consequence of morbidities during ante partum and intrapartum period, there is an increased risk of occurrence of various morbidities during the postpartum period. Care during the puerperium receives less attention from researchers than ante partum and intrapartum care in many developing countries, even though it is the period during which most maternal mortality occur<sup>6</sup>. Danel et. Al., reported that in El Salvador the incidence of significant morbidity during delivery was hemorrhage, fever, prolonged labor (over 24 hours), loss of consciousness, possible preeclampsia, and convulsions<sup>7</sup>. From a study in Nepal, it was reported that delivery-related problems included labor exceeding 18 hours, heavy bleeding, and fainting<sup>8</sup>. Bhatia showed that in India, 18 % of the women reported problems during antenatal period and an equal proportion during delivery<sup>9</sup>. In another study, conducted in South India, it was found that 33 % of women reported at least one problem; the most common were weakness, anemia, and lower abdominal pain<sup>10</sup>. According to Prual et. al., the main direct causes of severe maternal morbidity in West Africa were hemorrhage, obstructed labor, eclampsia, and sepsis<sup>11</sup>.

Various studies were undertaken on maternal morbidities in different countries including Bangladesh. The information on maternal morbidities at the community level in Bangladesh is scanty. The studies published in this field are hospital-based or cross-sectional, and most of these focused on maternal mortality<sup>12-17</sup>. Hospital-based case reviews included only women who sought the kind of treatment that did not permit speculation about the nature and magnitude of the untreated segment, while hospital discharge surveys measure the incidence of serious conditions that require hospitalization<sup>18-19</sup>. Long-term pregnancy-related morbidity was reported to be 28.6% in Bangladesh, 25.5% in Egypt, 19.7% in Indonesia, and 8.2% in India. The percentage of respondents with at least one complication during the index pregnancy and puerperium ranged from 58.3% in India to 79.9% in Bangladesh<sup>20</sup>. According to Akhter et al., the major causes of morbidity, in relation to pregnancy, were reported to be, urinary complaints (29 %), edema during ante partum period (23 %), excessive bleeding (20 %), prolonged labor for >18 hours during intrapartum period (7 %), lower abdominal pain (49 %), urinary problems (19 %), and fever for more than 3 days during postpartum period (17 %)<sup>17</sup>.

Several studies demonstrated that the most important causes of maternal deaths in rural Bangladesh were eclampsia, septic abortion, postpartum sepsis, obstructed labor and ante partum and postpartum hemorrhage<sup>13-14,21-22</sup>. It was observed that prior to death, 42 percent of the pregnancies were attended by traditional practitioners and 33 percent were not attended at all<sup>16,23</sup>. In another study, Koblinisky et al., reported that the number of acute morbidities related to childbirth could be as many as 67 episodes for every maternal death in a country such as Bangladesh<sup>24</sup>.

As morbidities vary in pregnancy, delivery and postpartum period, to understand its levels and determinants prospective studies can provide important insight. However, due to cost and time, very few

prospective studies were conducted. Bangladesh Rural Advancement Committee (BRAC), in collaboration with London School of Hygiene and Tropical Medicine, undertook a prospective study on postpartum morbidity and its relation to delivery practices<sup>25</sup>. They identified that postpartum morbidities were very common in the community. Bangladesh Institute of Research for Promotion of Essential and Reproductive Health and Technologies (BIRPERHT) conducted in 1993 a prospective study on maternal morbidity in Bangladesh, which was funded by Ford Foundation.

Data on maternal morbidity make it possible to assess how women are likely to need essential obstetric care, and helps the government's short-term and long-term planning and policy making process<sup>11</sup>. The present report is based on data from a prospective study on maternal morbidity in rural Bangladesh. Here an attempt is made to identify the relationship between the complications that e

### **Data and methods**

We used the data from the prospective survey on Maternal Morbidity in rural Bangladesh, conducted by the Bangladesh Institute of Research for Promotion of Essential and Reproductive Health and Technologies (BIRPERTH). The data collection period spanned from November 1992 to December 1993.

A multistage random sampling was employed to collect data on maternal morbidity. One district from each of four divisions was selected in the first stage. In the second stage, one thana (a thana is comprised of several unions, giving a population size of 0.2-0.25 million) from each selected district was selected randomly. In the third stage, two unions (unions are comprised of several wards, which are small geographical areas comprised of villages in rural areas) from each selected thana were considered as study area. Finally, for the prospective study, 1020 pregnant women (pregnancy less than 6 months) were interviewed. Prospective subjects were followed-up at intervals of on an average of one month, through full-term pregnancy, delivery and till 90 days postpartum period or 90 days after any other pregnancy outcome. The information on socio-economic background, pregnancy-related care and practice, extent of morbidity during the index pregnancy, delivery and postpartum period or abortion were collected. Out of 1020 women, 993 had at least one antenatal follow-up, and 1005 had information on the termination of pregnancy. Finally, 1006 had at least one postpartum follow-up.

### ***Delivery complications***

This study makes an attempt to address several important issues concerning complications at the time of delivery: (1) nature of delivery (normal or assisted), (2) delivery assistance from trained or untrained personnel, (3) place of delivery (own home, mother's home, hospital/clinic), (4) complications at the time of delivery (no complication, excessive hemorrhage before or after delivery, obstructed labor, prolonged labor, retained placenta/others), and (5) duration of delivery pain (less than 1 hour, 1 hour or more). These are the outcome variables of interest in the present study.

The respondents were asked about the nature of delivery. The reported categories of nature of delivery were (i) normal delivery, (ii) trial labor, (iii) breech, (iv) forceps assisted delivery, (v) c-section, and (vi) destructive procedure. Due to small number of cases in our analysis, we regrouped (ii)-(vi) as complicated delivery. In other words, trial labor, breech and assisted deliveries are considered as delivery complications.

The following postpartum complications were considered: hemorrhage, any other discharge, pelvic pain, cough or fever for more than three days, headache, giddiness, palpitation, weakness, weight loss, anxiety, convulsion, fits, burning sensation during micturation, and others. All these complications were coded, as binary variables (yes, no).

Respondents were asked about complications at different postpartum visits. To avoid complications arising from any association between repeated observations on the same individual, we considered only the first occurrence of a specific complication in any postpartum follow-up. The problems that demand a relatively sophisticated diagnosis may be under-reported, or misreported as something else, or lumped into an extensive symptomatic part that does not allow a particular diagnosis.

## Results

Relationship between selected deliveries complications with complications that arises during postpartum period are presented in Table 1.

Table 1. Distribution of Respondents by Postnatal Complications and Delivery Complications

Delivery Complications	Percentage of Postnatal Complications											
	Hemorrhage	Any other Discharge	Pelvic Pain	Cough or Fever 3+ days	Headache	Giddiness	Palpitation	Weakeness	Weight loss	Anxiety	Convulsion	Fits
<b>Nature of Delivery</b>			**	*	**	**	**	**	**	**		
Normal	37.5	47.6	38.8	17.7	33.3	37.9	52.4	93.7	66.0	31.2	0.7	1.5
Abnormal	38.8	50.0	52.5	26.3	47.5	63.8	77.5	97.5	85.0	51.8	-	1.3
<b>Delivery Attendant</b>	**		*	**	*				*			
Untrained TBA	35.6	48.0	41.0	19.6	35.6	39.4	54.8	93.8	68.8	33.0	0.5	1.4
Trained	51.2	46.4	32.8	10.4	27.2	44.0	52.0	95.2	59.2	36.8	1.6	1.6
<b>Place of Delivery</b>	**	**	**	**			**	**		**		
Own House	32.5	67.5	60.0	17.5	52.5	50.0	65.0	95.0	77.5	52.5	-	-
Hospital/Clinic	19.5	54.4	26.5	4.9	33.6	41.6	45.1	89.4	61.5	41.2	-	-
Mothers House	33.3	52.4	57.1	4.8	23.8	47.6	76.2	90.5	66.7	71.4	4.8	-
Outside house/others	44.1	44.3	42.7	23.4	34.1	38.7	56.3	95.6	69.0	28.6	0.7	2.1
<b>Complications at the time of delivery</b>					*	**			**	**		
Excessive hemorrhage before or after delivery	41.9	51.6	48.4	21.0	45.2	54.8	64.5	93.5	87.1	56.5	3.2	3.2
Obstructed Labor	32.3	41.9	48.4	24.2	40.3	58.1	58.1	91.9	72.6	51.6	-	1.6
Prolonged Labor	34.3	50.4	37.2	12.4	36.5	47.4	55.5	93.4	67.9	34.3	-	1.5
Placenta /others	25.0	62.5	50.0	25.0	62.5	56.3	68.8	93.8	87.5	68.8	-	-

No problems	38.7	47.2	38.7	18.7	32.0	35.2	52.7	94.3	64.8	28.8	0.6	1.3
<b>Duration of Labor</b>	**		**	*				*		**		
< 1 hours	37.5	46.9	31.9	13.1	33.8	41.3	50.0	90.6	64.4	43.8	-	-
1+ hours	37.7	48.0	41.5	19.5	34.7	39.8	55.4	94.6	58.2	31.4	0.7	1.7

\*\* Significant at 1 % level; \* significant at 5 % level

### ***Nature of delivery and complications during postpartum period***

The nature of delivery addresses normal or assisted deliveries. The association between nature of delivery and selected postnatal complications are examined. About 39 percent of the assisted delivery cases experienced hemorrhage as compared to that of about 38 percent among normal deliveries. This difference is not statistically significant. However, the percentage of hemorrhage cases among both the groups appears to be very high. On the other hand, any other discharge is prevalent among 50 % of the assisted deliveries and about 48 % of the normal deliveries.

However, the incidence of pelvic pain is much higher among the respondents having had assisted delivery (52.5% among abnormal delivery cases compared to 38.8% among normal delivery cases).

Among other selected postnatal complications, nature of delivery is found to have significant association with cough or fever more than three days, headache, giddiness, palpitation, loss of weight, anxiety, and burning sensation during the postpartum period. The percentage of all these significant postpartum complications was higher for assisted deliveries compared to the normal ones.

### ***Delivery attendant and complications during postpartum period***

In the rural areas of Bangladesh, it is unlikely to arrange for trained delivery among the vast majority of the poor women without or very low level of schooling. However, it is observed that only the most vulnerable cases are referred to the trained birth attendants as appear from the results. Postnatal complications like hemorrhage, pelvic pain, cough or fever more than three days, headache and weight loss were significantly associated with the delivery attendance. Pelvic pain, cough or fever more than three days, headache, and weight loss were less frequent among the women whose deliveries were attended by trained personnel. The women whose deliveries were attended by trained personnel had experienced a lower rate of suffering from complications during postnatal period except for hemorrhage. The incidence of hemorrhage during postpartum appeared to be higher among those reported to have been attended by trained personnel at the time of delivery. This might be attributed to the fact that trained personnel attended most of the pregnancies with complications at the time of delivery.

### ***Place of delivery and postpartum complications***

The place of delivery showed a significant association with hemorrhage, any other discharge, pelvic pain, cough or fever for more than three days, palpitation, weakness, and anxiety during postpartum period. Hemorrhage, pelvic pain, cough or fever for more than three days, palpitation, weakness, and anxiety were less frequent among the deliveries performed at hospital or clinics as compared to those performed at the own house of the respondents.

### ***Complications at the time of delivery and postpartum complications***

Complications at the time of delivery were significantly associated with headache, giddiness, weight loss, anxiety, and other complications during postpartum period. The reported incidence of headache

during postpartum period was highest for those who had retained placenta/other problems at the time of delivery and lowest when there was no delivery complication. Giddiness during the postpartum period was reported to be highest for those who had obstructed labor at the time of delivery. It was followed by retained placenta/other problems, excessive hemorrhage before or after delivery, prolonged labor, and no problem at delivery. The incidence of weight loss and anxiety during postpartum period was found to be the highest among respondents who had retained placenta/other problems. These features were also found, in decreasing order, in subjects who had excessive hemorrhage before or after delivery, obstructed labor, prolonged labor, and no problems.

#### ***Duration of labor and postpartum complications***

Duration of labor was significantly associated with pelvic pain, cough or fever for more than three days, weakness, anxiety, and burning sensation. All these postpartum complications were more frequent for longer duration of labor (one hour or more) except for anxiety. However, anxiety was more frequent among those who had experienced labor for less than one-hour.

#### **Discussion**

The present study makes an attempt to focus on some important concerns associated with delivery and their associations with the postpartum complications among the rural women. From the bivariate analysis, we found that women with assisted deliveries had higher risks of having pelvic pain, cough or fever more than three days, headache, giddiness, palpitation, weight loss, anxiety, and burning sensation during micturition during postpartum period compared to those of normal delivery. It is clear that the mode of delivery plays a crucial role in determining the postpartum complications. It is reasonable to assume that such a large burden of morbidity can affect markedly the pregnant women's productivity and the well being of their families. It is observed that the risk of hemorrhage increases significantly during the postpartum period for those who were attended by trained personnel at the time of delivery as compared to those by untrained personnel. This may be due to the fact that in rural areas where most of the deliveries are performed at one's own home or mothers home, only the complicated cases are taken to the local clinics or hospitals for delivery. It is difficult to bring trained personnel home for delivery. Hence, subjects with severe problems or indications of possible complications are likely to be attended by trained personnel. Deliveries attended by trained personnel had a lower risk of having cough or fever for more than three days, and weight loss compared to those deliveries attended by untrained personnel. Several studies previously reported a significant relationship between delivery attendance, quality of health services and various postpartum complications<sup>23,26-28</sup>.

The place of delivery emerged as a strong determinant of various postpartum complications in our study. The deliveries that took place at hospital/clinics have higher risks of having pelvic pain and palpitation compared to those at mothers' home. In the socio-economic setting of Bangladesh, only small proportions of deliveries are performed in hospitals/clinics. In most of the cases, particularly in rural areas, only the complicated cases of pregnancies are referred to the hospitals/clinics. Deliveries at hospital/clinics have a lower risk of having headache compared to those at the own house or other places. The deliveries performed in hospitals/clinics have increased risk of having anxieties compared to those at own house and mother's house.

Complications at the time of deliveries are significant determinants of headache, giddiness, weight loss, anxieties, and other complications. Deliveries with retained placenta/other problems have higher risks of having headache during postpartum period, compared to that of deliveries with no complications.

Deliveries with excessive hemorrhage before and after delivery, obstructed labor, and prolonged labor have higher risks of having giddiness as compared to those with no delivery complications. Those who had excessive hemorrhage before and after delivery appear to have an increased risk of losing weight during postpartum period. Similarly, deliveries with excessive hemorrhage before and after delivery, obstructed labor, and retained placenta/other problems have a higher risk of having anxieties during postpartum period as compared to those with no delivery complications.

Longer duration of labor (more than one hour) showed a significantly higher risk of pelvic pain during postpartum period. It is noteworthy that other complications such as cough or fever for more than 3 days, weakness and burning sensation appear to have positive association with prolonged duration of labor. However, surprisingly, in case of prolonged duration of labor (more than one hour) the risk of having anxiety is lower.

In this paper we discussed the complications of delivery and postpartum period in the rural areas of Bangladesh. The government of Bangladesh is trying to improve the maternal health of women through different programs. We hope that the findings from this study will assist in the planning of resource allocation, service modification, expansion and enhancement of the policy development regarding maternal health services in Bangladesh.

### **Policy Implications**

From the findings of this paper, we observe that a number of policy implications emerge. The potential policy implications are listed below:

- (i) **Strengthening of Services During Antenatal Period:** The antenatal services can be strengthened to take account of the following important strategies to reduce maternal morbidity: (a) to provide maternal education regarding safe motherhood, (b) to measure the necessary indicators (blood pressure, pregnancy history, height, weight, blood glucose level, etc.) in order to provide specific suggestions, (c) to identify status regarding malnutrition, (d) to identify by the category of high risk or low risk by age, parity, anemia, and other factors, etc. In other words, if there is enough information about the pregnant women during the pregnancy, if adequate suggestions are provided during early stage and if the high risk pregnancies are identified at the early stage then the number and severity of complications will be reduced to a large extent.
- (ii) **Adequate Facilities During Delivery:** In Bangladesh, only a very negligible proportion of deliveries take place in hospitals/ clinics. Moreover, there is acute shortage of trained personnel in assisting deliveries or there is communication gap between the availability of services and their proper utilization. This has been a longstanding problem in the context of safe motherhood issues in Bangladesh. This concern needs immediate attention.
- (iii) **Follow-up of Postnatal Complications:** There is no appropriate mechanism to follow-up the pregnancies from antenatal to delivery and then from delivery to postnatal period. Due to lack of such care in the network of health system, most of the pregnancies suffer as a result of unnecessary time lags attributable to absence of the mechanism to identify the problems and to suggest remedial measures before being too late. These lapses result in an increase in the more severe complications in the long run. Hence, immediate policy measures are

necessary to revise the health policy such that there should be a system to follow-up each pregnancy at antenatal, delivery and postnatal stages, so that the problems can be identified at an early stage and proper measures can be suggested before it is too late.

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