Complications of home delivery: Our experience at Nepal Medical College Teaching Hospital

H Tuladhar, R Khanal, S Kayastha, P Shrestha and A Giri

Corresponding author: Dr. Heera Tuladhar, Associate Professor, Department of obs/gyne, Nepal Medical College Teaching Hospital, Jorpati, Kathmandu, Nepal

ABSTRACT

A prospective study was conducted at Nepal Medical College Teaching Hospital to find out the complications of home delivery, maternal and fetal outcome and the main factors leading to home delivery. Among the 114 women who were brought to the hospital after home delivery, one was brought dead and one more died shortly after arrival. Sixty point five percent were housewives with no formal occupation, 68.4% were illiterate, 64.0% were multipara, Maximum no. of women belonged to the age group 20-24 years, 15.8% were adolescents, *Lasheta (Lama, Sherpa , Tamang)* was the most common ethnic group, Most of the women delivered at full term, whereas preterm delivery occurred in 4 (3.6%). Majority (73.7%) of the women had attended antenatal care at least once and half of the women had attended 4 and more visits. More than half had been fully immunized with tetanus toxoid and taken iron supplementation. As the reasons to deliver at home: 32.5% stated to be due to financial limitations, 30.7% due to ignorance and 16.7% due to transport limitations, and rest due to 'other reasons' which were most commonly stated as to be lack of attendant at home, long distance to hospital or delivery occurring too quickly or too late at night to attend the facility of choice. Ninety four point seven percent delivered at home with no trained assistance. Majority of the women (72.8%) were brought with retained placenta or excessive bleeding per vaginum. Twenty one point nine percent of the women were brought in shock needing active resuscitation. Twenty seven point two percent had postpartum hemorrhage. It was found that antenatal services were well utilized, but mothers were less likely to access good quality delivery/ postnatal care. Despite the availability of services however, women still went on to deliver at home without any trained assistance, and this effect was greatest for the t less educated, poorer women. Financial and transport limitations appear to be some of the most important factors in women's inability to access skilled care. This important barrier to care will need to be addressed if we intend to improve delivery service to the most vulnerable of women.

Keywords: Home delivery, antenatal care, complications.

INTRODUCTION

Pregnancy is a physiological process but also a period of potential risk leading to complications during labor, delivery, and postnatal period. The provision of care for women during pregnancy and childbirth is essential to ensure a healthy and successful outcome of pregnancy for the mother and her newborn. Maternal mortality is a global burden, lots of women dying due to pregnancy and childbirth-related complications. Birth-preparedness and complication readiness is a comprehensive strategy to improve the use of skilled providers at birth, the key intervention to decrease maternal mortality.

The Maternal Mortality Ratio (MMR) for Nepal is very high with 281 deaths per 100,000 live births (alternatively, 3 deaths per 1,000 live births) and the need for treatment of women with obstetric complications is inadequately met.[1] At present, approximately 2500 women die due to causes related to pregnancy and childbirth and those who survive may suffer from long term disability and ill health. In Nepal, approximately, 90.0% of deliveries take place at home. In many developing countries, the majority of births occur without the help of a skilled assistant (defined as a midwife, nurse trained as midwife, or a doctor) at home or in other non-hospital settings. In rural districts, the proportion of institutional deliveries is as low as 4.0%.[2] Even in urban Kathmandu, a significant proportion of women, approximately 19.0%, still deliver at home despite supposedly accessible institutional maternity services.[3,]http://www.pubmedcentral.nih.gov/articlerender.fcgi?tool=pmcentrez&artid=425583 - B7[4]

Maternal mortality and morbidity survey[5] done in 1998 reported that the direct causes of maternal mortality in Nepal are: postpartum hemorrhage (47.0%), obstructed labor (16.0%), pre-eclampsia/eclampsia (14.0%), puerperal sepsis (12.0%), abortion complications (5.0%), others (6.0%). The survey reported that among all the maternal deaths, 11.0% occurred on the way to health facility, 21.0% at health facilities and 68.0% at home. The primary intervention for reducing maternal mortality

Table-1: Socio-demographic characteristics of the study population (n=114)

Characteristics	**No.**	**%**
Age Group (years)		
15-19	18	15.8
20-24	53	46.5
25-29	27	23.7
30-34	11	9.6
35-39	3	2.6
40+	2	1.8
Parity		
1	41	36.0
2-4	70	61.4
5+	3	2.6
Occupation		
Housewife	69	60.5
Laborer	35	30.7
Farmer	8	7.0
Business	2	1.8
Ethnic group		
Lama/Sherpa/Tamang	58	50.9
Brahmin/Chhetri	26	22.8
Magurali	19	16.7
Newar	6	5.3
Others	5	4.3
Educational status		
Illiterate	78	68.4
Primary	19	16.7
Secondary	10	8.8
Intermediate & above	7	6.1

is universal access to assistance at birth by a skilled birth attendant and provision of essential and emergency obstetric care. Women in Nepal access maternal health services more consistently during pregnancy than during delivery or after childbirth. The first 24 hours of delivery is the most critical period for the postpartum mother, when the greatest number of deaths occur. Women delivering in a health facility should remain for observation for the first 24 hours period, and those who deliver at home need close observation as well, preferably by a skilled birth attendant who can recognize signs of problems, manage and refer immediately when needed.[6] The National Safe Motherhood Program of Nepal emphasizes the provision of round the clock emergency obstetric service including transport and financial assistance. The program has recently implemented the scheme of financial and incentive for the mothers who choose institutional delivery. [7]

Although the debate on the safety and women's right of choice to a home delivery vs. hospital delivery continues in the developed countries, an undesirable outcome of home delivery, such as high maternal and perinatal mortality, is documented in developing countries. Skilled delivery attendance is of crucial importance rather than hospital delivery per se. Home deliveries in the absence of skilled professional attendants have been associated with adverse infant and maternal outcome. Presence of a professional attendant at each birth can lead to a marked reduction in maternal mortality and morbidity. Professional health care during childbirth is one of the process indicators to assess progress towards the Millennium Development Goal of improving maternal health. It can be easily appreciated that home deliveries in Nepal are in no way comparable to planned home deliveries in developed countries with a trained midwife and immediate access to emergency transport A distinction needs to be made between women who plan for a home birth and those who have an unintended home birth, as unintended home births or women who received no antenatal care are linked to a higher rate of both maternal and perinatal complications.[8]

Implementation of an effective program for promotion of maternal health requires understanding of the community health care practices. Information about home delivery and its complications in Nepal is limited

Table-2: Antenatal care (ANC)

No. of visits	**n.**	**%**
None	30	26.3
1	14	12.3
2-3	13	11.4
4 and more	57	50.0
Place of ANC		
Hospital	58	69.1
Private clinic	10	11.9
Health post	16	19.0
Tetanus Toxoid (T.T.) immunization		
None	36	31.6
Partial	14	12.3
Full	64	56.1
Iron supplementation		
None	45	39.5
Yes	69	60.5

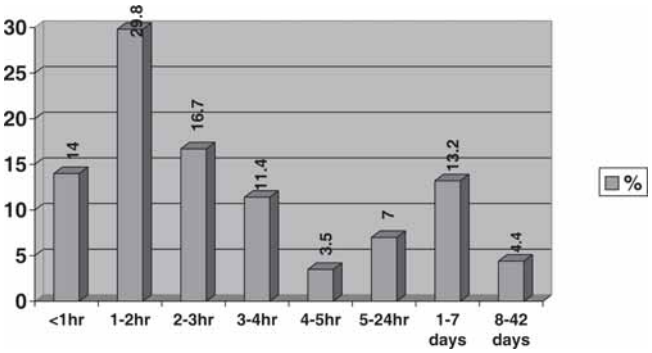

Fig. 1. Time from delivery to arrival at hospital

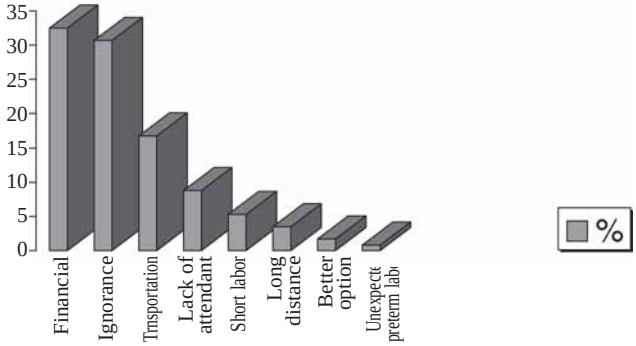

Fig. 2. Reasons stated for home delivery

and such information will be useful for policy makers. Therefore, this study was conducted with following objectives to find out:

1. Complications, management and fetal and maternal outcome of the cases.
2. Time interval between delivery and arrival at hospital.
3. Main reasons for delivering at home

Besides these main objectives, the study also looked into the demographic characteristics, ANC attendance, type of delivery, birth attendant, manipulations done at home and duration of hospital stay.

MATERIALS AND METHODS

This is a hospital based prospective study conducted in Nepal Medical College Teaching Hospital which is a 700 bedded tertiary care hospital and medical college situated at Jorpati, a suburban area of Kathmandu. The area mainly consists of population of lower socioeconomic class, most of them working as laborers especially in carpet factories. The study period extended from 15th April, 2004to 16th October, 2008 total duration being 4½ years. The study group consisted of all cases who were admitted in the hospital after being delivered at home up to six weeks of delivery. A partially structured questionnaire was filled up by interviewing all those cases; the information was obtained from the relatives when the woman is very sick and not able to communicate. The purpose of the study was explained and informed verbal consent was obtained. All questionnaires were reviewed daily till the time of discharge from the hospital. The questionnaire included information regarding the age, parity, ethnic group, area of residence, educational status, occupation, duration of gestation, obstetric history, details of present pregnancy, ANC attendance, details of labor at home, type of delivery, fetal outcome, distance from hospital, time between delivery to arrival at hospital, reason for delivering at home and reason for attending hospital. Type of complication identified at hospital, management done and final outcome was also recorded.

RESULTS

The total number of cases admitted after delivery at home was 114. Total number of delivery during the study period was 3473. The proportion of home delivery was 3.2%. Most of the women (82.4%) were brought to the hospital within 24 hours of delivery. Twenty women (17.6%) attended after 24 hours of delivery upto 42 days postpartum. 25 (21.9%) women were brought in state of shock.

One woman was brought dead after twin delivery at home with severe postpartum hemorrhage, another one expired in the hospital after 2 hours of arrival with massive postpartum hemorrhage. The death rate was 1.8%.

Maximum no. of women belonged to the age group 20-24 years, 15.8% were adolescents, *Lasheta (Lama, Sherpa, Tamang)* was the most common ethnic group, 36% were primipara. Most of the women delivered at full term, whereas preterm delivery occurred in 4 (3.6%).

Eighty four (73.7%) women had attended ANC at least once and half of the women had attended 4 and more visits. Majority came to hospital for ANC, more than half (56.1%) had been fully immunized with TT and 60.5% had taken iron supplementation. 67 (58.8%) women had planned for home delivery whereas only 47 (41.2%) had chosen hospital delivery.

Most of the women resided within 4 km. from the hospital. Only 12.2% were brought from more than 6 km. distance.

About 66.0% of the women were brought to the hospital only after 2 hours of delivery.

One hundred six (93.0%) women had spontaneous term vaginal delivery, 4 had preterm,3 had breech and 1 had twin delivery. Most (87.6%) of the deliveries were attended by unskilled attendants like family member and friends and 7.0% delivered without any attendants, only 5.3% were conducted by medical personnel. Manipulations at home (abdominal pressure, pulling the cord, tying heavy objects in the cord for traction etc.) were done in 14 (12.3%) cases. There were 3 still births (2 fresh, 1 macerated) and 1 neonatal death. Perinatal mortality rate was 35.08/1000 births

Table-3: Complications and duration of hospital stay

Complications	**No.**	**%**
Retained placenta	84 (separated 61, not separated 23)	73.7
Perineal tear	69 (3 third degree tear)	60.6
Puerperal pyrexia	41 (7 puerperal sepsis)	35.8
Postpartum hemorrhage	31	27.2
Shock	25	21.9
Cervical tear	8	7.0
Cervical descent	7	6.1
Retained membrane	5	4.4
Pregnancy induced hypertension	5	4.4
Others (deep vein thrombosis, acute renal failure)	2	1.8
***Most of the cases had more than one complications**		
Duration of hospital stay (days)		
1	30	26.3
2	46	40.4
3	30	26.3
4	2	1.8
5-7	4	3.4
>7 days	2	1.8

The most common reason stated for delivering at home was financial problem followed by ignorance and lack of transportation.

More than half of the women had Hb <10 gm%. The lowest level of Hb was 2.5 gm%. 29(25.4%) women needed blood transfusion as most of them presented with significant post partum hemorrhage with anemia.

The most common complication was retained placenta with or without post partum hemorrhage. In puerperal patients, most common was puerperal pyrexia with sepsis or urinary tract infection.

Most of the cases were managed by simple procedures like controlled cord traction, administration of oxytocin/ ergometrine and repair of perineal tear, however some needed active resuscitation and major surgical procedure like laparotomy for pelvic abscess too. Most of the cases were resuscitated with intravenous fluids (65.0%), antibiotics were administered to 86.0% of the cases.

Majority were cured within short time and discharged within 3 days, but some (13 left against medical advice and 10 discharged on request) left the hospital before full recovery due to financial and social reasons.

DISCUSSION

This study analysed 114 women attending our hospital after some complications during delivery at home. A majority of the births in most developing countries, particularly in the rural areas, takes place at home, usually assisted by relatives or traditional birth attendants In the study done by Bolam *et al* in Kathmandu, 272 (81.0%) had an institutional delivery and 62 (19.0%) delivered at home.[3]

Reasons for home delivery: The place of delivery and its determinants have been on the research agenda for a long time.[9,10] Sixty eight point four percent of the women were illiterate and 64.0% are multipara in our study. Bolam *et al.* have reported that multiparity and lower maternal education are associated with home delivery.[3] In this study, 67 (58.8%) women had planned for home delivery whereas only 47 (41.2%) had chosen hospital delivery. The study conducted by Moran *et al* has reported that 46.1% had a plan for transportation, and 83.3% had a plan to save money.[11] This finding is also similar to that of study done in Pokhara city of Nepal, planned home deliveries were 140 (58.3%) and 100 (41.7%) were unplanned.[12]

Low socio-economic status and the long physical distance of more than one hour to the maternity hospital acted as barriers to hospital delivery as reported by Wagle's study.[13] In present study 12.2% of the women were brought from more than 6 km distance from the hospital. In rural Nigeria, maternal education and occupation, religion, and occupation of the husband are found to be most consistently associated with the use of health institutions for delivery – at the same time maternal age, parity, and marital status and place of the residence are not significantly associated.[14] In a Ugandan study, it was shown that access to maternity services is one of the influencing factors in choice of delivery site.[15] Low socio-economic status has been found as a predictor for place of delivery. Although we have not classified

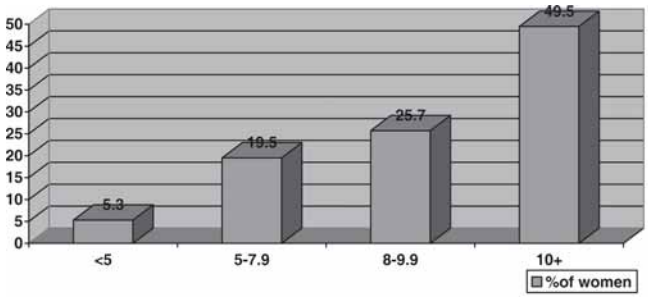

Fig. 3. Hb gm% of the women

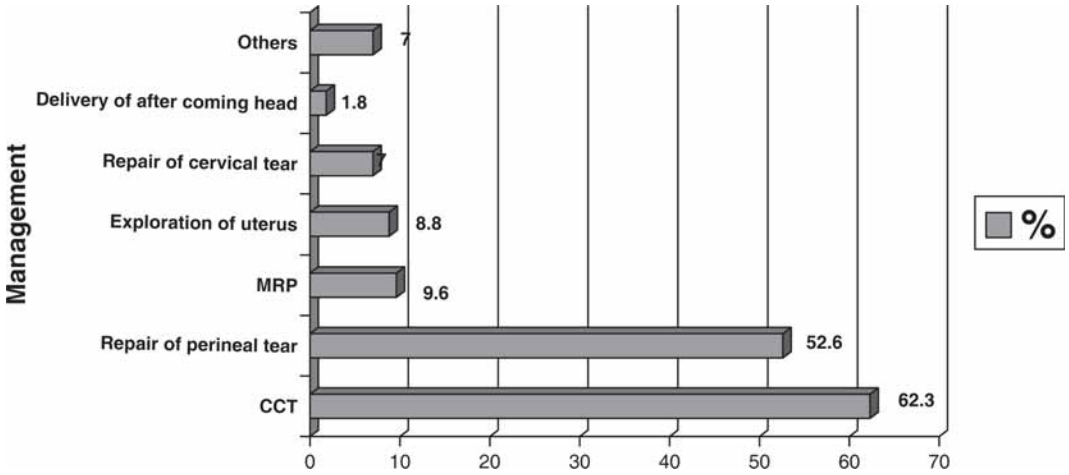

Fig. 4. Management done in the hospital

the socio-economic status in this study, financial problem was stated by most of the respondents as the barrier to use of hospital service followed by ignorance and transportation problem. Other studies also have implicated different socio-economic factors as determinants of place of delivery. In a Nigerian study, 41.0% of the mothers who did not deliver in hospital explained that they could not afford the hospital bill, and 31.0% said they had inadequate transportation possibilities.[16] Main reasons cited for delivering at home in study by Sreeramareddy *et al* were 'preference' (25.7%), 'ease and convenience' (21.4%) for planned deliveries while 'precipitate labor' (51.0%), 'lack of transportation' (18.0%) and 'lack of escort' during labor (11.0%) were cited for the unplanned ones.[12] In-depth qualitative studies are needed to further explore the reasons for delivering at home.

Antenatal care attendance: Attendance at antenatal clinics (ANCs) and receipt of professional delivery care have been associated with a reduction in maternal deaths. Antenatal care attendance was quite satisfactory as 84 (73.7%) women had attended ANC at least once and half of the women had attended 4 and more visits. Distance was a barrier for facility delivery but not for ANC attendance. The utilization of antenatal care services does not necessarily equate to delivery at the health facility as observed in this study. 90.0% visited the antenatal clinic (ANC) at least once in a study done in rural Kenya, but most women (83.0%) delivered outside of a health facility.[17]

Attendance at delivery: Home deliveries without a skilled attendant are chosen or occur for a variety of reasons, including long distances or difficult access to a birth facility, costs of services and perceived lack of quality of care in a health facility.[10,18-19] Only 5.3% of the deliveries were attended by medical personnel in this study ,even no attendance in 7.0% and majority attended by family members and friends. Similar findings were observed in another study in Pokhara 6.2% of deliveries had a skilled birth attendant present and 38 (15.8%) mothers gave birth alone.[12] Bolam *et al* also found that 91.0% home deliveries were attended by relatives at best having only own experience of childbirth, and only 7.0% by intermediate level health professionals. Of home deliverers, only 24% used a traditional birth attendant, and over half were unplanned due to precipitate labour or lack of transport.[3] In Eijk *et al*'s study , traditional birth attendants assisted 42.0%, laypersons assisted 36.0%, while 22.0% received no assistance.[17] Providing access to care during the relatively short period of labor and delivery is logistically much more difficult than making services available during the antenatal period. More effective strategies are needed to promote skilled attendance at birth during antenatal care, particularly among poor women.

Manipulations at home like abdominal pressure, pulling the cord, tying heavy objects in the cord for traction etc. was reported by 12.3% of the respondents. Similar harmful practices such as frequent vaginal examination with unclean hands and the application of animal dung and herbal medicines to the vulva or the vagina are some of the practices, which may cause genital infection.[20]

Complications: The most common complication in this study was retained placenta with or without post partum hemorrhage. Puerperal pyrexia was the most common reason in women attending after 24 hours of delivery. The rate of home births within the United Kingdom remains low at approximately 2.0%,[21-23] where the most serious reasons for transfer to hospital are maternal hemorrhage, concerns about fetal wellbeing and the neonate born in an unexpectedly poor condition. Delay in transfer under these circumstances may have serious consequences.

Perinatal mortality rate was 35.08/1000 births. Infants of planned home deliveries were at increased risk of neonatal death and Apgar score no higher than 3 at 5 minute and

among nulliparous women, these deliveries also were associated with an increased risk of prolonged labor and postpartum bleeding in Pang *et al* 's study in Washington.[24]

Studies done in Missouri, North Carolina, and Australia[25-27] observed an elevated risk of neonatal death in intended home births delivered by professional providers. Still birth occurred in 2.6% and neonatal death in 0.9%. The Northern region's perinatal mortality survey, reports 134 perinatal losses in 3466 births outside the hospital, about four times the number of losses in hospital births.[27]

Whereas a study done in Washington State on intended home births found no increased risk of neonatal mortality.[28]

There were two maternal deaths due to severe post partum hemorrhage in this study. Verbal autopsy data from a study of 145 maternal deaths in Mexico, in 1995, 46.3% had non-institutional community based deliveries and nearly 35.0% of maternal deaths were attributable to haemorrhage.[29]

Access to essential skilled birth attendants remains difficult especially for less educated, poorer women, commonly mediated by financial and transport difficulties. These factors need to be addressed to ensure that high quality care reaches the most vulnerable women and infants.

At delivery, the importance of skilled attendance has long been recognized. There might be a need to encourage women during antenatal care to reach out for skilled attendants when home delivery becomes inevitable.

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