Original Article

Maternal and Neonatal Health Outcome of Childbirth in a Birthing Center, Kathmandu

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Abstract

Government of Nepal has strategy to establish birthing center in each health facilities to provide maternal and newborn care to decrease maternal and neonatal morbidity and mortality. This study was conducted to find out the maternal and neonatal health outcome of childbirth in birthing center of Paropakar Maternity and Women's Hospital (PMWH). A descriptive research design was used .The study population was women admitted for delivery at a birthing center. The purposive sampling technique was used with sample size 174. Data was collected by using structured interview schedule and record review of maternal and neonatal outcome from medical record. Data were coded and entered into statistical Package for the Social Sciences, version 18 and frequency, percentage, mean and standard deviation for descriptive and chi- square, fisher's exact and spearman's correlation for inferential statistical were used.

The women, who were less than 20 years of age, primi and literate had higher rate of perineal injuries than the women who were more than 20 years, multiparous and illiterate. The babies of primi mother received lower APGAR score than multiparious mother.

The findings revealed that half (50%) of women had spontaneous labor, majorities (89.1%) of women had spontaneous vaginal delivery. More than half (53.6%) of women were given episiotomy and least (1.2%) of the women had complication in third stage of labor. About eight percentage of newborns required newborn resuscitation and admission to NICU was 4.2%. The study found that the multiparous women had higher rate of spontaneous labor than primi women.

In conclusion, the women delivering in birthing center had fewer maternal and neonatal complications. Thus this finding signifies the need to development of nurses- led birthing center in the country to provide services closer to community.

Key words: Maternal and Neonatal Health out Come, Childbirth, Birthing Center

Introduction

A birthing center was originally defined as any health facility, place or institution that is not a hospital or in a hospital, and where births are planned to occur away from the mother's usual residence following a normal uncomplicated pregnancy. The American Association of Birth Centers (AABC) defines the birth center as "a homelike facility existing within the health care system with a program of care designed in the wellness model of pregnancy and birth. Birth centers provide family-centered care for healthy women before, during, and after normal pregnancy, labor, and birth. Birthing centers are small maternity units which are handling by midwives. Birth centers are known for providing friendly, individualized care in an atmosphere that is informal and unhurried. They are also known as midwife led maternity unit. (AABC, 2005).

For women thought to be at low risk for obstetrical complications, labor and delivery at a birth center can result in higher patient satisfaction, cost savings, and equivalent or better outcomes than in hospital birth (Swart, Jackson, Lang, Ganiats, & Dickinson, 1998).

Rana, Rajopadhyaya, Bajracharya, Karmacharya, and Osrin (2003) had conducted a comparative study in Patan Hospital which concluded that after appropriate screening the trained nurse midwives can care the lower risk laboring women effectively.

Healthy women are the foundation of a strong community, and healthy newborns are the future. Healthy maternal and neonatal outcomes depend upon quality of maternity care provided by the team of skilled care providers. In Nepal, maternal mortality rate is still high and neonatal mortality rate is static. Government of Nepal has strategy to establish birthing center in each health facilities to provide maternal and newborn care to decrease maternal and neonatal morbidity and mortality. Most maternal deaths were a direct consequence of under-utilization of appropriate health services and low quality of care. The Government of Nepal identified skilled birth attendance as the key strategy for reducing maternal and neonatal mortality. However, skilled birth attendance and management of obstetric complications were mainly available only at hospitals and referral facilities. These facilities were not widely used by the poorer groups who tend to go to lower level facilities. It was therefore determined that delivery interventions were needed to build demand in the community as well as to increase access to quality emergency obstetric care services, especially by developing birthing centers that would bring services closer to the community (DoHS, 2011/2012).

Similarly Kafle (2009) concluded that there was no evidence of adverse maternal and fetal outcome at birthing center compared to standard hospital. Janssen, Ryan, Etches, Klein, and Reime (2007) concluded that a shift toward greater proportion of midwife–attended births in hospitals could result in reduced rates of obstetric interventions, with similar rates of neonatal morbidity. A study confirmed the findings of the National Birth Center Study and other studies of birth center model of care and adds to the evidence demonstrating excellent maternal and infant outcomes for women receiving midwifery-led care in birth center (Stapleton & Illuzzi, 2013). Reddy, Reginald, Spring, Nunn, and Mishra (2004) concluded that the birth setting is safe to deliver low-risk women with less intrapartum intervention and a low transfer rate and should be setting an example for any future similar birth centre.

Maternal health and newborn health are closely linked. More than three million newborn babies die every year, and an additional 2.6 million babies are stillborn (Cousens et al., 2011). In Nepal, Neonatal mortality rate (NMR) is 33 per 1000 live birth (NDHS, 2011). The global causes of neonatal mortality in 2012 are preterm birth complication, intrapartum related complications, meningitis, pneumonia, congenital abnormalities, tetanus, diarrhea (UNICEF, 2013).

Government of Nepal has strategy to increase institutional delivery up to 60% by the year 2015, and percentage of SBA delivery 60% by the year 2015. Only 44 % women giving birth are attended by skilled birth attendant and Institutional delivery is 43% (DoHS, 2011/2012). Though government of Nepal has established 1121 birthing centers, only twenty eight percentage of the estimated live birth took place in birthing center and Basic/ Comprehensive Emergency Obstetric Care facilities (DoHS, 2011/2012). Skilled care before, during and after childbirth minimize the complication of maternal and newborn and it can save the lives of women and newborn babies (WHO, 2012). A lots of studies supported that there was good outcome of mothers and newborns in birthing centers with less intervention.

Methodology:

This was hospital based descriptive study. The study was conducted at Birthing center of Paropakar Maternity and Women's Hospital (PMWH), Kathmandu. The study population was 174 women who were delivering at birthing center of PMWH. The purposive sampling technique was used for this study.

All pregnant laboring women admitted in birthing center with a singleton pregnancy at 37 weeks of gestation with a vertex presentation were the inclusion criteria of this study.

Semi structured and structured interview schedule is used to collect the information.

Data was collected after getting approval from Campus, T.U, I.O.M; Research department and Hospital .Data collection period was four weeks (Chaitra 2070 to 19th Baisakh, 2071). Data was collected by researcher herself after fourth stage of labor (after 2 hour of delivery and before discharge) from the hospital. Verbal informed consent was obtained after explaining the purposes of the study. Privacy was maintained by using bedside screen. Adequate time was provided for them which took about 20 -30 minutes.

Collected data was checked for completeness of information then edited, coded, entered and analyzed by using Statistical Package for Social Sciences (SPSS) version 18. Frequency, percentage, mean and standard deviation were used for descriptive analyses. Data was tested for normality by using Shapiro-Wilk test. P-value is .000. So that non-parametric test such as Chi-square test, Fisher's exact test and Spearmen's rho test were used for inferential analysis.

Findings/Result:

Obstetric information of the women; regarding parity, the majorities (73%) of the women were primiparous. The mean gestational age was 39.96±1.02.More than half (56.9%) of the women had visited ANC clinic for 1 to 3 time and only 37.9% of the women had completed 4 ANC visit.

Half (50%) of the women had spontaneous onset of labor followed by augmented labor 42.5% whereas induced labor in the minority 7.5%. Among 42.5% of women with augmented labor, majorities (94.6%) of the women had augmentation of labor with oxytocin only 5.4% of women had augmentation of labor by artificial rupture of membrane. It is also revealed in following table No 1.

TABLE 1
Type of Labor of Women

n=174

Type of Labor	Frequency	Percent
• Spontaneous	87	50.0
• Induced	13	7.5
• Augmented	74	42.5

Out of 174 women, majorities (89.1%) of the women had spontaneous vaginal delivery followed by vacuum delivery 6.3%. 4.6% women were transferred out for caesarean section. Out of 11 women, the three fourth (72.7%) of the women had vacuum delivery for fetal distress whereas for prolonged second stage of labor (27.3%). Majority (95.4%) of the women was managed at birthing center and only 4.6% of the women had transfer at intrapartum. Among them, equal percentages (50%) of the women were transferred out for fetal distress and slow progress of labor.

Out of 166 women, least (1.2%) of the women had complication in third stage of labor. More than half (53.6%) of the women had episiotomy, followed by 18.9% first degree tear and 10.8% second degree perineal tear while perineal laceration 5.4%. Least (0.6%) of the respondent had third degree of perineal tear.It is also revealed in table No 2 and 3

TABLE 2
Complication of Third Stage of Labor

n=166

Variables	Frequency	Percent
Complication of third stage of labor (n=166)		
No	164	98.8
Yes	2	1.2
If yes, Type of complication (n=2)		
Postpartum Hemorrhage	1	50.0
Vulval Hematoma	1	50.0

TABLE 3
Condition of Perineum after Delivery of Women

n=166

Condition of Perineum after Delivery	Frequency	Percent
Intact	18	10.8
Laceration	9	5.4
1st degree perineal tear	31	18.9
2nd degree perineal tear	18	10.8
3rd degrees perineal tear	1	0.6
Episiotomy	89	53.6

Discussion:

Majorities (73%) of the women in this study were primiparous which was inconsistent with the findings by Ryan & Roberts (2005) showing almost equal (50.8%) nulliparous and multiparous women visiting birthing center. A contrast result shown by Tracy et al. (2007) revealed 41.33% nulliparous women visited in midwives group. The findings by Patrica et al. (2007) and Waldenstrom & Nilsson (1997) revealed more than half nulliparous women visiting birthing center.

In this study, majorities (89.7%) of the women were delivered at 37- 40 weeks of gestation. The mean gestational age was 39.96±1.02 which was consistent with the findings of MacDorman and Singh (1998) with mean gestational age 39.5 and Gagnon et al. (1997) with mean gestational age 39.8.

In this study, majorities (94.8%) of the women had visited Antenatal clinic with 1 to 3 ANC visit made by 56.9% women and completed four ANC visits by 37.9% women which is lower than the result by NDHS (2011) showing 50% of women making four or more antenatal care visits during their pregnancy.

Regarding the type of labor, half (50%) of the women had spontaneous onset of labor followed by augmented labor 42.5% whereas induced labor in the minority 7.5%. Among 42.5% of women with augmented labor, most of the women (94.6%) had augmentation of labor with oxytocin only 5.4% of women had augmentation of labor with artificial rupture of membrane.

This study resulted 7.5% women who had induced labor which is consistent with the findings by Ryan & Roberts (2005) showing 7.7% women with induced labor. The study by Hundely et al. (1994) showed higher induction rate in birthing center with 21.4%.

Likewise, 42.5% women had augmented labor in this study which was supported by Gagnon et al. (1997) revealing rate of augmentation of labor was 39.2%. But this finding was inconsistent with findings by Ryan and Roberts (2005) showing 12.2% women who had augmented labor.

A study by Kafle (2009) showed the augmentation of labor with oxytocin was 22.4% in birthing center, by amniotomy was 5.4%. A study by Janssen et al. (2007) showed slightly higher rate (29.5%) of augmentation of labor by amniotomy. This study showed higher rate of augmentation of labor birthing center which may be due to the women come to birthing center in active phase of labor is high and another reason may be that the labor was monitored by using partograph in birthing center and hence the nurse midwives probably augmented labor in case of slow or non progress.

This study finding showed that majorities (89.1%) of the women had spontaneous vaginal delivery followed by vacuum delivery 6.3%; only 4.6% women were transferred out for caesarean section. This finding is supported by a study by Ryan and Roberts (2005) that reported 8.3% vacuum delivery and 3.3% caesarean delivery with majority (78.2%) of spontaneous vaginal deliveries in the birthing center; by Arya et al. (1996) that reported 94.7% normal vaginal delivery, by a study Reddy et al. (2004) reported that around 85% normal delivery rate, around 6% emergency caesarean section rate. But, Hundely et al. (1994) showed a higher rate (6.9%) of incidence of caesarean section in birthing center.

Fetal distress in nearly 73% laboring women evidenced by presence of meconium in amniotic fluid and prolonged second stage of labor in about 27% laboring women evidenced through partograph were the indications identified by this study for vacuum delivery.

Regarding complications in third stage of labor, this study showed 0.6% women had post partum hemorrhage which is lower than the findings which were 3.1% (Stern et al., 1992), 13.1% (Begaly et al., 2011) and 17% (Penwell, 2004) respectively.

This study revealed majorities (53.6%) of the women had episiotomy, followed by first degree perinael tear (18.9%), second degree perineal tear (10.8%) while perineal laceration 5.4%. least (0.6%) of the respondent had third degree of perineal tear. Second degree tear was found higher by Ryan and Roberts (2005) with 39.4%. The findings of episiotomy and perineal tear from this study was inconsistent with the findings by Bernitz et al. (2011) with 23%

episiotomy rate and 5% third or fourth degree tear; Broklehurst (2011) with 17.8% episiotomy rate and 3.1% and third or fourth degree tear; Janssen et al. (2007) with 11.5% episiotomy rate and 4.3% third or fourth degree perineal tear.

In this study, majorities (83.7%) of newborns had obtained less than seven APGAR score followed by 16.3% newborns had obtained equal and more than seven APGAR score at one minute. Likewise, majorities (94%) of newborns had obtained equal and more than seven APGAR score at five minute and the least (6%) of newborns had less than seven APGAR score at five minute. In contrast, Morano et al. (2007) reported that 2.6% of newborn had an equal or less than seven APGAR score at one minute. Similarly, Ryan and Roberts (2005) revealed 7.2% of newborn had less than seven APGAR score at one minute and 0.7% had less than seven APGAR scores at five minutes. Another study by Campose and Lana (2007) found 1% of newborn had obtained less than seven APGAR scores at five minute. In contrast, Lukasse et al. (2006) concluded that only 0.3% baby had obtained less than seven APGAR score at five minute.

In present study, the mean APGAR score at one minute was 5.99 ± 0.75. In contrast, Rana et al. (2003) found the mean APGAR score at one minute was 8. Likewise the mean APGAR score at five minute was 7.82 ± 0.69 in this study.

This study concluded that 7.8% of newborns required resuscitation. The reasons for newborn resuscitation were birth asphyxia and meconium stained liquor. The finding of this study is consistent with the findings by Ryan and Roberts (2005) which reported 6% newborn required bag and mask resuscitation in birthing center; by a study findings by Arya et al. (1996) concluded that assisted ventilation was provided in 5.2% babies. Similarly, Mahmood (2003) reported 9% newborns required resuscitation. In contradictory, Penwell (2004) found 15% newborn required resuscitation.

In present study, 4.2% of newborns were admitted in NICU. The reasons for admission to NICU were birth asphyxia, low birth weight, grunting and cyanosis, and congenital anomaly. But Campose and Lana (2007) concluded that the NICU admission rate was 1.2% due to respiratory distress as a major cause. Similarly, Mahmood (2003) reported approximately 2% of newborn required NICU admission. Arya et al. (1996) found 1.1% babies were admitted to the neonatal unit.

Conclusion:

These study findings concluded that half of women had spontaneous vaginal delivery. More than half of women were given episiotomy and least of the women had complication in third stage of labor. Least of babies was needed resuscitation and admitted to NICU. The study found that the multiparous women had higher rate of spontaneous labor than primi mother. The women, who were less than 20 years of age, primi and literate had higher rate of perineal injuries than the women more than 20 years, multiparous and illiterate. The newborn of primi mother received lower APGAR score than the newborn of multi parous mother.

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References

Begley, C., Devane, D., Clarke, M., McCann, C., Hughes, P., Reilly, M., Doyle M. (2011). Comparison of Midwife-led and Consultant-led Care of Healthy Women at Low Risk of Childbirth Complications in the Republic of Ireland: A randomized trial. *BioMedCentral Pregnancy and Childbirth.* Retreived on February 16, 2014, from http://www.biomedcentral.com/1471-2393/11/85

Bernitz, S., Rolland, R., Blix, E., Jacobsen, M., Sjoborg, K., & Oian, P. (2011). Is the operative delivery rate in low risk women dependent on the level of birth care? A randomized controlled trial. *British Journal of Obstetrics and Gynecology: An International Journal of Obstetrics and Gynaecology, 201* 1357-1364. Retreived on February 16, 2014, from http://onlinelibrary.wiley.com/doi/10.1111/j.1471-0528.2011.03043.x/full

Brocklehurst, P. (2011). Perinatal and maternal outcomes by planned place of birth for healthy women with low risk pregnancies: The Birthplace in England national prospective cohort study. *British Medical Journal, 343,* 1-13. Retreived on February 14, 2014, from http://www.womenandbirth.org/article/S1871-5192 (13)00069-3/fulltext

Campose, S. E., & Lana, F. C. (2007). Results of childbirth care at a birthing center in Belo Horizonto, Minas Gerais, Brazil. *Cadernos de Saúde Pública, 23*(6), 1349-1359. Retrieved on February 13, 2014, from http://www.scielo.br/scielo.php?pid=S010231 1X2007000600010&script=sci_abstract

Department of Health Services (DoHS). (2013). *Annual Report* 2011/2012. Kathmandu, Nepal: Ministry of Health and Population.

Janssen, P. A., Ryan, E. M., Etches, D. J., Klein, M. C., & Reime, B. (2007). Outcome of planned hospital birth attended by midwives compared with physicians in British Columbia. *Birth, 34*(2), 140-147. Retreived on February 16, 2014, from http:// www.ncbi.nlm.nih.gov/pubmed/17542818

Kafle, D. R. (2009). Comparison of fetomaternal outcome of laboring pregnant women managed in birthing center and conventional consultant led maternity unit. Retreived on February 16, 2014, from http://library.nams.org.np/nams/collect/ namsthes/import/Deepak%20Raj%20Kafle.pdf

Lukasse, M., Qian, P., & Aamodt, G. (2006). A midwife-led birthing unit. *Tidsskar Nor Laegeforen, 126*(2), 170-172. Retrieved on February 16, 2014, from http://www.ncbi.nlm.nih.gov/pubmed/?term

Mahmood, T. A. (2003). Evaluation of an experimental midwife –led unit in Scotland. *Journal of Obstetrician and Gynecology*, *23*(2), 12-19. doi: abs/10.1080/0144361031000074619.

Morano, S., Cerutti, F., Mistrangelo, E., Pastorino, D., Benussi, M., Costantini, S., & Ragni, N. (2007). Outcomes of the first midwife-led birth centre in Italy: 5 years' experience. *Archeves of Gynecology and Obstetrics, 276,* 333-337

doi: 10.1007/s00404-007-0358-9

Nepal Demography and Health Survey. (2011). Ministry of Health and Population, Population Division. Kathmandu: Government of Nepal.

Pradhan, A., Suvedi, B. K., Barnett, S., Sharma, S. K., Puri, M., Poudel , P.,... Hulton, L. (2010). *Nepal maternal mortality and morbidity study 2008/09*. Retrieved on February 10, 2014, from http://reliefweb.int/report/nepal/nepal-maternal-mortality-and-morbidity-study-200809-summary-preliminary-findings

Rana, T. G., Rajopadhyaya, R., Bajracharya, B., Karmacharya, M., & Osrin, D. (2003). Comparison of midwifery-led and consultant led maternity care for low risk deliveries in Nepal. *Health Policy Plan*, *18* (3), 330-337. Retreived on February 16, 2014, from http://www.ncbi.nlm.nih.gov/pubmed/12917274.

Reddy, K., Reginald, P. W., Spring, J. E., Nunn, L., & Mishra, N. (2004). A free standing low-risk maternity unit in the United Kingdom: Does it have a role? *Journal of obstetrics and Gynaecology, 24* (4), 360-6. doi:10.1080/01443610410001685448.

Ryan, M., & Roberts, C. (2005). A retrospective cohort study comparing outcomes of a birth centre and labor ward in the same hospital. *Australian Midwifery Journal*, *18*(2), 17-21. Retreived on February 10, 2014, from http://www.sciencedirect. com/science/journal/14488272/18/2

Schmidt, N., Abelsen, B., & Quian, P. (2002). Deliveries in maternity homes in Norways: results from a 2 year- prospective study. *Acta Obstetrical and Gyanecological Scand, 81*(8), 731-7 retrieved on february10, 2014, from http://www.ncbi.nlm.nih. gov/pubmed/12174157

Shrestha, P. (2013). Hospital Statistics (2069/2070). Smarika Paropakar Maternity and Women's Hospital, 54th Anniversary. 77-81.

Stapleton, S. R., & Illuzzi, J. (2013). Outcomes of care in birth centers: Demonstration of a durable model. *Journal of Midwifery and Women's health, 58*(1), 3-14. Retreived on February 9, 2014, from http://onlinelibrary.wiley.com/doi/10.1111/ jmwh.12003/abstract

Tracy, S. K., Dahlen, H., Caplice, S., Laws, P., Wang, Y. A., & Tracy, M. B. (2007). Birth centers in Australia: A national population based study of perinatal mortality associated with giving birth in a birth center. *Birth, 34*(3), 194-201. Retrieved on February 10, 2014, from http://www.ncbi.nlm.nih. gov/pubmed/17718869

World Health Organization, UNICEF, UNFPA, and the World Bank. (2012). Trends in maternal mortality 1990-2010, department of reproductive Health and Research, WHO, Avenue Appia, Ch-1211 Geneva, Switzerland. Retrieved on February 13, 2014 from *https://www.unfpa.org/.../2012/ Trends_in_maternal_mortality_A4-1.pdf*