OPEN ACCESS

ORIGINAL ARTICLE

Pattern of Childbirth in Tertiary Hospital in Dang; A Retrospective Study

Shikha Tiwari[1], Basant Lamichhane[1], Shishir Kunwar[1], Prashansa Gurung[2], Jharana R.C[1], Rakesh Poudel[1]

[1] Department of Obstetrics and Gynaecology, Rapti Academy of Health Sciences, Ghorahi, Dang, Nepal
[2] Department of Obstetrics and Gynaecology, Nepal Mediciti Hospital, Lalitpur, Nepal

Article Info:

Received Date: May, 2025

Acceptance Date: August, 2025

Corresponding Author:

Shikha Tiwari
Lecturer and Consultant
Department of Obstetrics and Gynaecology,
Rapti Academy of Health Sciences,
Ghorahi, Dang, Nepal
Email: ttiwarishikha595@gmail.com

Funding sources: None

Conflict of interest: None

Access the article online

DOI: 10.70027/jrahs64

Abstract

Introduction: Childbirth is a complex process requiring skilled clinicians and well-equipped facilities. In recent years, cesarean section (CS) rates have risen worldwide, while spontaneous and instrumental vaginal deliveries have declined. This study aimed to assess childbirth modes, its associated factors and feto-maternal outcomes at a tertiary hospital in Dang.

Methods: A descriptive retrospective study was conducted at Rapti Academy of Health Sciences. Medical records from 14th April 2023 to 13th April 2024 were reviewed following institutional ethical approval. Data on maternal and neonatal demographics, mode of delivery, and outcomes were analyzed. Data expressed in frequency with percentage were presented in tables and diagrams.

Results: Vaginal delivery accounted for 62.2% (4.1% instrumental) and CS for 37.8%. Most mothers were of 20–24 years, and 93.1% delivered at term. Leading CS indications were previous LSCS (23.1%), cephalopelvic disproportion (20.7%), meconium-stained liquor(17.6%), fetal distress(13%), malpresentation(12.3%), antepartum hemorrhage (1.4%), and failed vacuum (0.4%). Maternal complications included second-degree tear(4.9%), postpartum hemorrhage (1.5%), paraurethral tear (0.8%), cervical tear (0.3%), and shoulder dystocia (0.4%); 2% required blood transfusion, with two peripartum hysterectomies and two maternal deaths. Neonatal complications were perinatal asphyxia (2.1% singletons, 6.1% twins), early-onset sepsis(1.6% singletons, 12.2% twins), jaundice (1.3%), meconium aspiration (0.8%), late-onset sepsis (0.2%), stillbirth (0.2%), and hypoxic ischemic encephalopathy (0.2%).

Conclusion: Vaginal delivery remains the predominant mode, though CS rates are increasing. Delivery mode was influenced by maternal age, obstetric factors, and comorbidities, significantly affecting feto-maternal outcomes. Strengthening obstetric services and timely interventions are crucial to improve maternal and neonatal health.

Keywords: cesarean section; childbirth; fetal outcome; maternal outcome; vaginal delivery

Introduction

Birthing customs vary by region, nation, and culture, as well as by the accessibility and availability of medical care.[1] The health of mothers is the cornerstone of public health as well as the attention to global health and development that have been characterized by maternal mortality.[2] Childbirth is considered safe when it is attended by skilled birth attendant, though only 60.2% of institutional delivery occurs in Nepal.[3] Childbirth may be spontaneous vaginal delivery as well as induced vaginal delivery or operative delivery but the increasing practice of cesarean section has become the major issue. In last

Citation:

Tiwari S, Lamichhane B, Kunwar S, Gurung P, R.C J, Poudel R. Pattern of childbirth in tertiary hospital in Dang: a retrospective study. JRAHS Journal of Rapti Academy of Health Sciences. 2025;2(1):8-14.

two decades, it has increased from 0.9% to 10.6%.[4] Globally, 10 to 20% of all delivery needs some assistance where 6 to 12% of intervention is caused by instrumental delivery.[5] Spontaneous as well as operative vaginal delivery requires the good clinical expertise, anesthesia service, and availability of instruments. In several studies, the rate of operative vaginal delivery is in decreasing trend from 1.6% to 0.3% , while the cesarean section rate is in rising trend.[6] The rate of cesarean section has risen even up to 50.9% in tertiary center of Nepal.[7] Prolonged second stage of labor and fetal distress are the common indications for instrumental delivery.[8,9] Fetal distress is the most frequent reason for cesarean section followed by prior cesarean section, non- progress of labor, oligohydraminos, malpresenation, cephalopelvic disproportion and hypertensive disorders during pregnancy.[10] Despite of all, cross-sectional ecological study involving all 194 WHO member states found a correlation between decreased maternal and newborn mortality with population-level CS rates of up to about 19 per 100 live births, so the judicial decision making is crucial.[11] This study focuses in assessing the various modes of childbirth and the factors affecting the mode as well as assessing the fetomaternal outcomes.

Methods

This descriptive study was conducted in Rapti Academy of Health Sciences (RAHS) that is a 300 bedded tertiary hospital located in Dang district of Lumbini province. After obtaining the ethical clearance from Institutional Review Committee (IRC-RAHS, 820), all the records of women who had childbirth in maternity ward of RAHS from 14th April 2023 to 13th April 2024 were collected. Records of neonates who were born in the same study period were also collected from the neonatal ward. The Health Management Information Sysyem (HIMS) has categorized ethinicity into various code and this code has been used in this study. It depicts code 1(Dalit), code 2 (Janajati), code 3 (Madhesi), code 4 (Muslims), code 5(Brahmin/ Chhetri), code 6 (others). All collected data were entered in excel sheet. Data was analyzed on SPSS Version 16.0. Data was expressed in frequency with percentage and presented in tables and diagrams.

Results

During the study period, total deliveries were 3120. Out of this, only 2825 cases had complete records, so 2825 cases were included in the study and remaining 295 cases were excluded from the study. Maximum number of childbirth was seen in the month of December and January. Out of total cases, 36% of cases were in the age group of 20-24 years whereas, 10.2% cases were teenagers and 5.4% were of advanced maternal age, however 2 cases of under 15 years of age were also recorded.

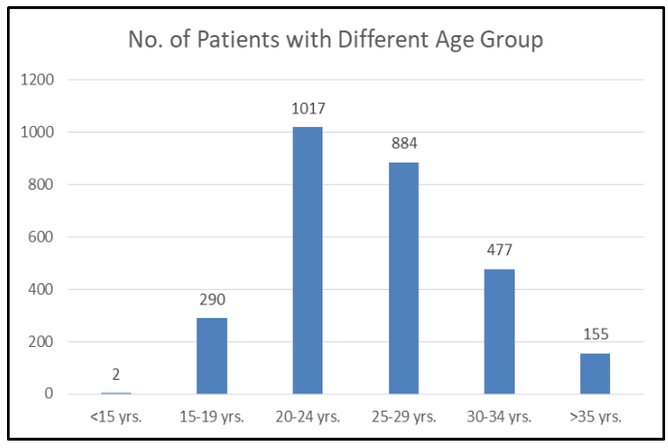

Figure 1: Bar diagram showing number of patients with different age group

Majority of cases accounting 81% (2291) were from Dang followed by Rolpa 10% (296) and Rukum 3% (95). Regarding the ethinicity, 44.50% (1257) cases were janajati followed by Brahmin/ chhetri 36% (1022) and dalit 13.59% (384).

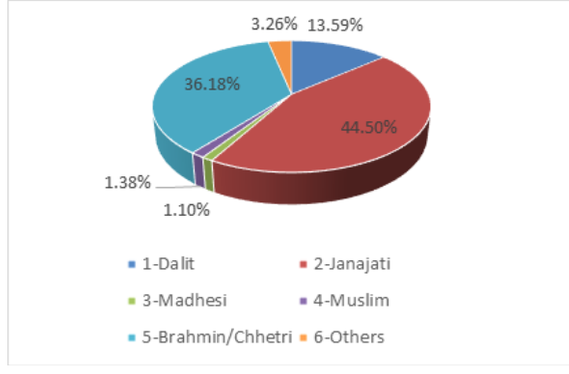

Figure 2: Pie chart showing patient flow based on ethnicity

Considering the mode of delivery, 62.16% (1714) of deliveries were vaginal which included instrumental delivery 4.11% (116), assisted breech delivery 0.39% (11) and vaginal birth after cesarean section 0.11% (3). The rate of cesarean section was 37.84% (1069).

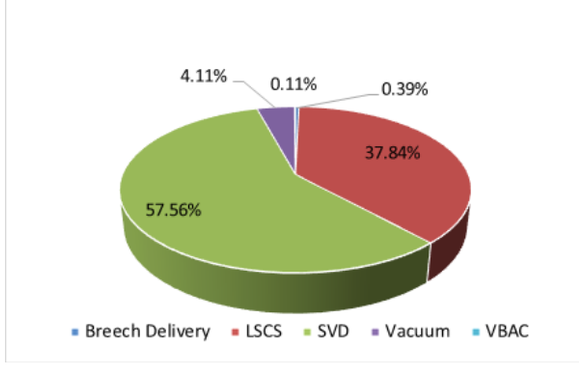

Figure 3: Pie chart showing different mode of delivery

The major indications of cesarean section were previous LSCS 23.10% (247), cephalopelvic disproportion 20.67%

(221), meconium stained liquor 17.58% (188), fetal distress 13% (139) malpresentation 12.28% (131), antepartum hemorrhage 1.4% (14). Whereas, 0.37% (4) cases of cesarean section for failed vacuum were also recorded.

Maternal complications specific to vaginal delivery were second degree tear 4.95% (140), obstetrical anal sphincter injury 0.2% (8),cervical tear 0.2% (7), para urethral tear 0.77% (21), paravaginal tear 0.14% (4) retained placenta 0.1% (3), supralevator hematoma 0.03% (1), infralevator hematoma 0.03% (1) and shoulder dystocia 0.4% (11). In the cases who underwent cesarean section, rectus sheath hematoma 0.03% (1), bladder injury 0.03% (1), hemoperitoneum 0.03% (1), and vesicovaginal fistula 0.03% (1) were the complications. However, primary post-partum hemorrhage (PPH) was the common complication in both the cases who underwent cesarean section and vaginal delivery which accounted 1.5% (44) of the total cases. Out of total cases, 1.53% (43) received blood transfusion. There were 2 cases who underwent peripartum hysterectomy for atonic PPH following vaginal delivery and caserean section in each case respectively. There were 2 maternal mortality recorded. Out of which 1 case was due to primary PPH following vaginal delivery and 1 was the case of antepartum eclampsia in which both cases of maternal mortality occurred during immediate postpartum period.

The maternal comorbidity was also analyzed. Out of them, 1.5% (44) cases were of rh-ve pregnancy, 0.5% (16) cases were of gestational hypertension, 0.4%(12) cases were of preeclampsia, 0.3% (10) cases were of eclampsia, 0.3% (12) cases were of syphilis, 0.2% (6) cases were of hepatitis B, 0.2 % (4) cases were of intrahepatic cholestasis, 0.1% (3) cases were of HIV, 0.14% (4) cases were of thyroid disorder, 0.1% (7) cases were of diabetes mellitus in pregnancy, 0.1 % (5) cases were of severe preeclampsia. Beside this, 1 case of thalassemia, 1 case of sickle cell anemia and 2 cases of iron deficiency anemia were also found.

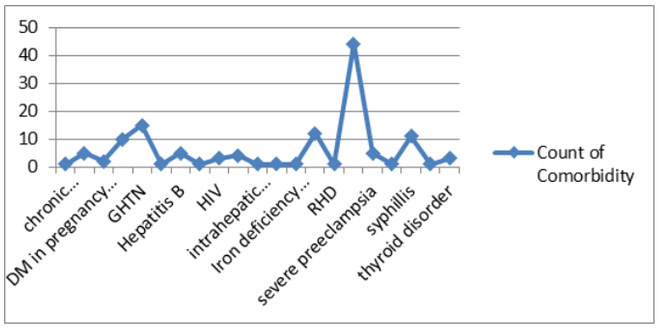

Figure 4: Frequency curve showing maternal comorbidity

The rate of singleton pregnancy was 99.12% and multi-fetal pregnancy was 0.88%. The rate of normal baby weight was 87%. Out of them, 10% of neonates were of low birth weight, 0.7% was very low birth weight, 0.7% neonates were extremely low birth weight and 0.4 % neonates were overweight. Similarly, the rate of multiple pregnancy was 0.88%. Out of which the rate of low birth weight baby was 1%, whereas 0.5% neonates had normal birth weight and 0.1% neonates were of very low birth weight.

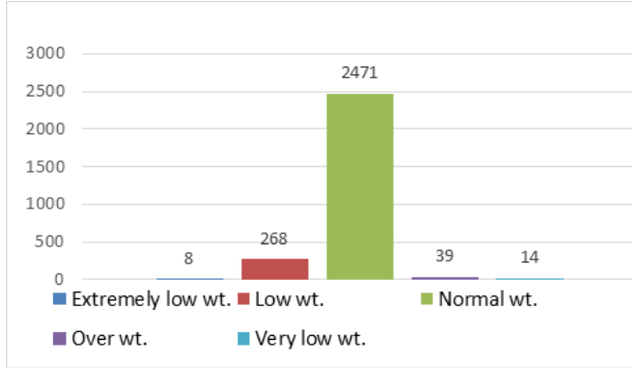

Figure 5: Bar diagram showing baby weight in singleton newborns

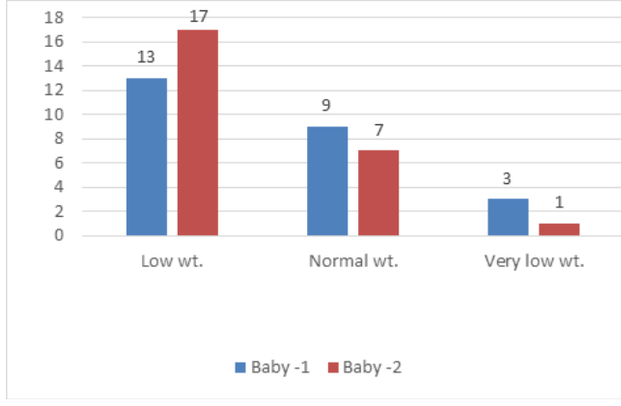

Figure 6: Bar diagram showing baby weight in twin newborns

The total number of newborn delivered were 2850. Newborns delivered from singleton pregnancy were 2800 whereas, 50 newborns were delivered from multiple pregnancy. There were 35 cases of macerated stillbirth and 7 cases of fresh stillbirth in singleton pregnancy whereas, one case of single twin intrauterine fetal death (IUFD) was recorded in twin pregnancy. Excluding the 42 cases of stillbirth in singleton pregnancy, the Apgar score of the newborn was recorded at 1 minutes and 5 minutes respectively. The rate newborn with no depression was 86.48%, newborns with mild depression were 11.28% and 2.25% newborns had severe depression recorded at 1 minutes. Similarly, 97.68% newborn had no depression, 2.14% had mild depression and 0.18% had severe depression recorded at 5 minutes.

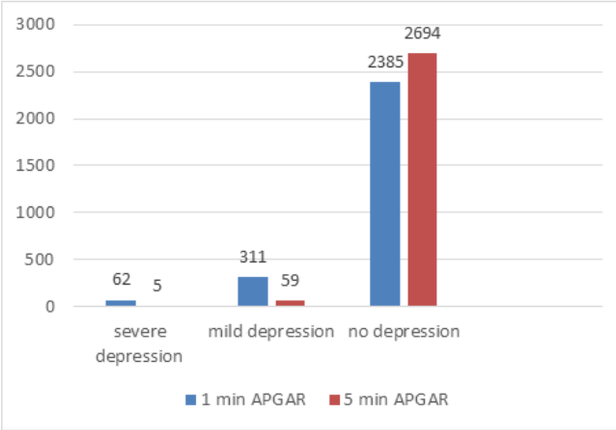

Figure 7: Bar diagram showing Apgar score in singleton newborns

There were 25 cases of multiple pregnancy where 49 newborn and one single twin IUFD was recorded. Excluding 1 case of single twin IUFD, APGAR score was calculated which showed 61.22% (30) newborns had no depression and 38.7% (19) newborn had mild depression recorded at 1 minutes. Similarly, 95% (47) of newborn had no depression and 4.08% (2) newborn had mild depression recorded at 5 minutes.

Table 1: Apgar score in twin newborns

APGAR Category	Baby-1 (1 Min)	Baby-1 (5 Min)	Baby-2 (1 Min)	Baby-2 (5 Min)
Severe depression	0	0	0	0
Mild depression	8	1	11	1
No depression	16	23	14	24
Total	24	24	25	25

Among 2758 singleton newborns, 7.14% (197) had neonatal complications. These include 2.13% (59) cases of perinatal asphyxia, 1.63% (45) cases of early onset neonatal sepsis, 1.26% (35) cases of neonatal jaundice, 0.79% (22) cases of meconium aspiration syndrome, 0.2% (7) cases of Hypoxemic encephalopathy and 0.2% (7) cases of late onset neonatal sepsis, 0.2% (6) cases of neonatal death, 0.07% (4) cases of congenital syphilis, 0.03% (1) cases of dehydration fever, 0.03% (2) cases of congenital hydronephrosis, 0.03% (1) cases of respiratory distress syndrome, 0.03% (1) cases of superficial skin injury, 0.03% (1) cases of transient tachypnea of newborn and 0.21% (7) cases of fresh still birth were recorded among 2758 singleton newborns.

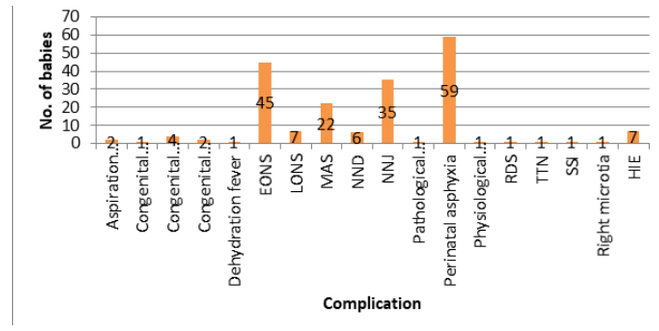

Figure 8: Bar diagram showing neonatal complications in singleton newborns

Similarly, among 49 cases of twin newborn, 18.36% (9) cases had newborn complications including 12.24% (6) cases of early onset neonatal sepsis and 6.12% (3) cases of perinatal asphyxia.

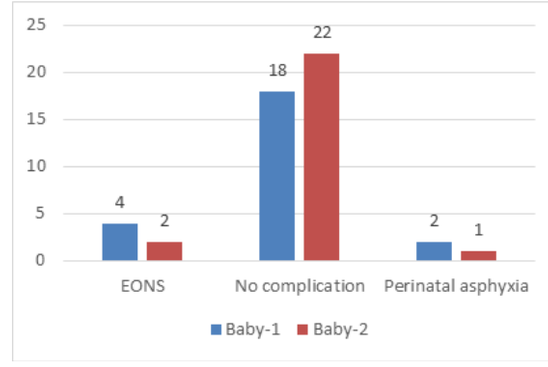

Figure 9: Bar diagram showing neonatal complications in twin newborns

Discussion

This study provides the general understanding into the current childbirth pattern and maternal as well as fetal outcome at a tertiary hospital in Dang. To the best of our knowledge, this paper provides the detailed demographic and clinical factors that are influencing the birth practice. This study reveals that, vaginal delivery is the most common mode of childbirth (62.16%) whereas the rate of cesarean section (37.84%) is also significantly high. The rate of vaginal delivery and cesarean section in Lumbini Zonal hospital is 74.2% and 25.8% respectively which is comparable to this institute.[12] Whereas the rate of cesarean section is higher as compared to the optimal rate 10% to 15% as per WHO.[13] The possible reason in this study could be fear of rupture uterus in case of previous cesarean section, non-availability of fetal scalp blood sampling for cases of meconium stained liquor, department policy regarding cases of fetal distress, trail of labor as well as referral cases. This rates is even higher (50.9%) seen in a study done at Kirtipur hospital.[7] Similar study in Patan Academy of Health Sciences reported this rate to be 46.9%[14] In other developing countries like India, some regions of South America have reported the rate of cesarean section

between 25 and 45% where as in developed countries like USA, UK ,China have reported the rate between 32%, 24%,and 27% respectively.[15,16]

The frequency of instrumental delivery was 4.11%, all of were vacuum assisted vaginal delivery. This rate is similar to the study conducted in Chitwan medical college 2.1%.[6] Similar study conducted in Patan Academy of Health Sciences showed the rate to be 1.12%.[5] However, the rate of instrumental delivery is high in the developed countries like Canada 16%, Australia 14%, England 11%, USA 10%, and Denmark 10%.[5]

The most common indication of CS in this study was previous LSCS followed by cephalopelvic disproportion, meconium stained liquor, fetal distress, and malpresentation. Similar study conducted in Kirtipur hospital showed the most common indication to be fetal distress (40.2%) followed by previous LSCS(13.5%) and oligohydramnios(8.9%).[7] Next study conducted in Chitwan Medical College also had similar reports showing fetal distress (24.9%) as the prime indication of CS.[17]

In this study, the most common maternal complication seen in both the cases of vaginal delivery and cesarean section was postpartum hemorrhage (1.5%). Though second degree tear, obstetrical anal sphincter injury, pelvic hematoma, shoulder dystocia were mostly seen in cases with vaginal delivery while rectus sheath hematoma, hemoperitoneum were common in the cases with cesarean section. Study conducted in Jammu and Kashmir where fetomaternal outcome was analyzed in the cases of instrumental delivery showed extension of episiotomy (15.2%) to be the most common maternal morbidity followed by cervical and vaginal laceration (22.62%) and primary postpartum hemorrhage (22.5%).[18] This frequency is much higher than our study. Similar study conducted in Chitwan medical college showed PPH (16.9%) to be the most common complication followed by blood transfusion (12.7%), pyrexia (8.5%), perineal tear(4.2%) which is higher compared to our study.[6] Next conducted in Kirtipur hospital showed pyrexia (39.6%) being the most common postpartum complication followed by thrombophlebitis (20.8%) and PPH (20.8%).[7] Similarly in the study conducted in Lumbini Zonal Hospital, postpartum hemorrhage (21.1%), prolonged labor (8.5%), wound infection (7.6%),vaginal tear (6.40%), mal presentation (2%),surgical injury (0.50%) and 3 cases of maternal mortality was noted which was similar to our study.[12]

In this study, maternal comorbidity associated were Rh-ve pregnancy (1.5%), gestational hypertension (0.5%), and preeclampsia (0.4%) followed by eclampsia, syphilis, hepatitis. Study conducted in Chitwan Medical College showed Pregnancy Induced Hypertension (PIH) (38.55%), hypothyroidism (15.68%), obstetric cholestasis (13.80%) and Gestational Diabetes Mellitus (GDM) (13.47%) were the associated maternal comorbidity which is higher compared to our study.[17]

There were 99.12% cases of singleton pregnancy and 0.8% cases of multi-fetal pregnancy, which has similar findings compared to the study done in Chitwan medical college as it showed 98.2% singleton pregnancy and 1.8% multiple pregnancy. In the same study, 77.5% newborn had normal weight whereas 20.9% newborn were of low birth weight, 1.3% were very low birth weight and 0.3% were extremely low birth weight whereas the rate of normal weight newborn and extremely low birth weight newborn was higher in our study.[17]

In this study 86.48% singleton newborn and 61.22% twin newborn had no depression at 1 minutes Apgar score. In those same newborns, 97.68% singleton and 95% twin had no depression at 5 minutes Apgar score. In the study conducted in the Chitwan Medical College, Apgar score was recorded on two basic category mentioning < 6 and > 6 with rate being 1.3% and 98.1% respectively at 1 minutes whereas 0.3% and 99.1% at 5 minutes respectively which shows similar result to our study.[17] Similar study conducted in Kirtipur hospital showed no cases with low Apgar score at 1 minute and 5 minutes. Whereas 6.8% newborn had moderately low Apgar score at 1 minute and 0.8% had the same at 5 minutes. 93.2% newborn and 99.2% newborn had reassuring Apgar score recorded at 1 minutes and 5 minutes respectively.[7] The rate of newborn at 1 minute Apgar was study whereas at 5 minutes Apgar, it was comparable in this study. However, in our study rate of newborns with mild depression Apgar and Low Apgar was higher.

In this study, 7.14% singleton newborns and 18.36% twin newborns had neonatal complications among which perinatal asphyxia was most common complication seen in singleton and early onset neonatal sepsis was most common in twin newborns. Similar study conducted where cesarean section was analyzed in Chitwan Medical College showed 29.1% newborn admission and the reason for admission are TTN, neonatal sepsis, respiratory distress syndrome and meconium aspiration syndrome.[17] Study conducted in Chitwan Medical College where instrumental delivery was analyzed, it showed 19.2% NICU admission and the reason of admission were scalp edema, cephalhematoma, scalp lacerations, fractures, intracranial hemorrhage, hyperbilirubinemia, nerve palsies, and rarely fetal death.[6] The rate of NICU admission is low in our study as compared to these studies.[9] cases of stillbirth were noted in the study conducted in Kist medical college which was less in comparison to our study where 6 cases were recorde.[19] In our study, these complications were not seen except hyperbilirubinemia and neonatal death, which was not exclusive to instrumental delivery. Next study conducted in Uttarakhand, where fetomaternal

outcome in instrumental delivery was analyzed showed cephalohematoma and neonatal hyperbilirubinemia being the most common neonatal complications followed by instrumental marks and bruises.[20]

As the study is retrospective, based on hospital records which introduces the possibility of missing or incomplete data and being solely conducted in RAHS, the results cannot be generalized to other settings or population.

Conclusion

The primary mode of delivery is found to be vaginal delivery in this study though the rate of cesarean section is high than the limit given by WHO being repeated cesarean section to be the most common cause. Instrumental delivery has also been the mode of delivery contributing to prevent the cesarean section but it still needs promotion and judicial use. Primary postpartum hemorrhage has been the most common maternal complication whereas perinatal asphyxia being the most common fetal complication. This study supports the need to monitor the trend of cesarean section and promote safe instrumental delivery because in the country with low socioeconomic status like Nepal where safe motherhood program promotes safe delivery, unnecessary cesarean section could add more burden to the economy of the nation. Instead, strengthening emergency obstetrics and neonatal services on the tertiary hospital, developing skilled work force, continuous training, quality assurance in labor management and patient education on birth are recommended to improve both fetal as well as maternal outcome.

References

1. AbouZahr C. Safe Motherhood: A brief history of the global movement 1947-2002. Br Med Bull. 2003;67:13-25. DOI: 10.1093/bmb/ldg014 PMID: 14711751

2. Thapa B, Karki A, Sapkota S, Hu Y. Determinants of institutional delivery service utilization in Nepal. PLoS One [Internet]. 2023;18(9 September):1-15. DOI: 10.1371/journal.pone.0292054 PMID: 37733812 PMCID: PMC10513198

3. Betran AP, Torloni MR, Zhang JJ, Gülmezoglu AM. WHO statement on caesarean section rates. BJOG An Int J Obstet Gynaecol. 2016;123(5):667-70. DOI: 10.1111/1471-0528.13526 PMID: 26681211 PMCID: PMC5034743

4. Lamichhane B. Outcome of Instrumental Vaginal Delivery at Patan Hospital. Nepal J Obstet Gynaecol [Internet]. 2018;13(3):10-2. DOI: 10.3126/njog.v13i3.23507

5. Joshi R, Shrestha S, Chaudhary J, Pandit U, Tamrakar R. Fetomaternal Outcome in Operative Vaginal Deliveries in a Tertiary Care Centre: A Descriptive Retrospective Study. J BP Koirala Inst Heal Sci. 2020;3(2):23-7. DOI: 10.3126/jbpkihs.v3i2.36092

6. P Pradhan, S Shrestha, PK Rajbhandari GD. Profile of Caesarean Section in Kirtipur Hospital. Nepal J Obstet Gyanecology. 2014;18(2):51-4. DOI: 10.3126/njog.v9i2.11763

7. Eriksen HM, Sæther AR, Løwer HL, Vangen S, Hjetland R, Lundmark H, et al. Infections after caesarean sections. Tidsskr Den Nor legeforening. 2009;129(7):618-22. DOI: 10.4045/tidsskr.09.24093 PMID: 19337329

8. Putta L V., Spencer JP. Assisted vaginal delivery using vacuum extractor. Am Fam Physician [Internet]. 2000;62(6):1316-20. Available from: https://www.aafp.org/pubs/afp/issues/2000/0915/p1316.html. PMID: 11011860

9. Maskey S, Bajracharya M, Bhandari S. Prevalence of Cesarean Section and Its Indications in a Tertiary Care Hospital. JNMA J Nepal Med Assoc [Internet]. 2019;57(216):70-3. DOI: 10.31729/jnma.4282 PMID: 31477935 PMCID: PMC8827579

10. Molina G, Weiser TG, Lipsitz SR, Esquivel MM, Uribe-Leitz T, Azad T, et al. Relationship between cesarean delivery rate and maternal and neonatal mortality. JAMA - J Am Med Assoc. 2015;314(21):2263-70. DOI: 10.1001/jama.2015.15553 PMID: 26624825

11. Sharma S, Dhakal I. Cesarean vs vaginal delivery: An institutional experience. J Nepal Med Assoc. 2018;56(209):535-9. DOI: 10.31729/jnma.3467

12. Shrestha M, Shrestha S. Cesarean Section profile at a tertiary center. Nepal J Obstet Gynaecol. 2020;15(1):68-71. DOI: 10.3126/njog.v15i1.29345

13. Pradhan B, Shrestha SD, RC L, Sharma P, Bhandary S. Increasing trend of caesarean section in Patan hospital. J Gen Pract Emerg Med Nepal. 2015;4(6):3-5. DOI: 10.59284/jgpeman122

14. Walker R, Turnbull D, Wilkinson C. Strategies to address global cesarean section rates: A review of the evidence. Birth. 2002;29(1):28-39. DOI: 10.1046/j.1523-536X.2002.00153.x PMID: 11843787

15. Miseljic N, Basic E, Miseljic S. Causes of an Increased Rate of Caesarean Section. Mater Socio Medica. 2018;30(4):287. DOI: 10.5455/msm.2018.30.287-289 PMID: 30936794 PMCID: PMC6377919

16. Tamrakar R, Sapkota S, Sitaula D, Thapa R, Pokharel B, Acharya S, et al. Cesarean section among all deliveries in a tertiary care centre of nepal: A descriptive cross-sectional study. J Nepal Med Assoc. 2021;59(241):839-43. DOI: 10.31729/jnma.6667
PMID: 35199724 PMCID: PMC9107895

17. Gupta DS, Bhagat DS. Retrospective study of maternal and perinatal outcomes of instrumental vaginal delivery in tertiary care hospital. Int J Clin Obstet Gynaecol. 2023;7(1):166-8. DOI: 10.33545/gynae.2023.v7.i1c.1271

18. Dwa YP, Bhandari S. Prevalence of Perinatal Deaths in a Tertiary Care Hospital of Nepal. J Nepal Med Assoc. 2019;57(217):164-7.
DOI: 10.31729/jnma.4431
PMID: 31477955 PMCID: PMC8827509

19. Abha S, Pratibha R. A comparative study of feto-maternal outcome in instrumental vaginal delivery. J Obstet Gynecol India. 2011;61(6):663-6. DOI: 10.1007/s13224-011-0119-3
PMID: 23204687 PMCID: PMC3307924