

# Delivery Profile and indications of Cesarean Section in a rural referral Hospital: What could be the implications?

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## ABSTRACT

**Introduction:** There is huge difference in cesarean section rate between rural (3.5%) and urban (15%) areas of Nepal. The national CS rate is around 5% whereas global CS rate is 26%. The objective of this study is to find out the delivery profile and rate and indications of CS in a rural university hospital.

**Methodology:** This is a three -year's retrospective cross-sectional study done from January 2016 to January 2019 (Magh 2072 to Poush 2075) at Karnali Academy of Health Sciences, Jumla. The data was retrieved from hospital birth profile records and analyzed using SPSS 20. Permission was taken from Institutional review committee (IRC) to conduct the study.

**Results:** Total number of delivery during this period was 1841 out of which 172 were Cesarean delivery giving a CS rate of 9.3%. The most common indication of CS were fetal distress (33.7%), previous CS (9.3%), failed induction of labor (9.3%). Non progress of Labor (8.1%) and post term pregnancy (8.1%). Majority of the CS were done as an emergency procedure.

**Conclusion:** The CS rate at KAHS teaching hospital was within WHO recommendation of between 5-15% and was very low in comparison to other centers situated in urban areas of the country. The indications of CS was also similar to the other national and international statistics.

**Keywords:** *Cesarean section, Indications, Nepal, Maternal health, rural area, Global trends*

## INTRODUCTION

Cesarean Section (CS) is often a lifesaving procedure, but it is not without risk and can sometimes be life-threatening for both mother and child<sup>1</sup>. However, it is agreed that increase in CS access decreases the maternal, neonatal and infant mortality rates<sup>2</sup>. The health facilities may also lack the required equipment and proper training when access is low<sup>2</sup>. Most

maternal deaths happen in labor, delivery, or during the first 24 hours postpartum<sup>2</sup>. Mortality can be reduced if intervened in this period of time<sup>2</sup>. Inability to get medical attention in time is one of the major contributing factor for maternal deaths in India<sup>3</sup>.

In the past decade, CS rate has increased globally reaching close to 26% in 2010<sup>4</sup>. There is huge difference in CS rates in different part of the world, for example approximately 1% in some African countries (South Sudan and Niger) and 56% in some American countries (Brazil and the Dominican Republic)<sup>5</sup>. There has been no consensus regarding optimal CS rate<sup>6</sup>. However, widely accepted recommendation is the one from WHO in 1985 which states that the CS rate should not exceed 15%<sup>2</sup>. There was a revision in WHO guidelines in 2009 which still recommending a CS rate between 5 and 15%<sup>7</sup>.

Various studies show that there is no better maternal or fetal outcome with a CS rate above 12–15%<sup>2</sup>. These researches indicate that a low CS rate might mean a poor access to CS when obstetric complications occur<sup>6</sup> whereas high CS rate increases the risk of maternal and neonatal morbidity<sup>6</sup>. United Nations' (UN) millennium goals number four and five aims to reduce child mortality and improve maternal health<sup>8</sup>. It states that most maternal deaths in developing countries are preventable through adequate nutrition, proper health care, including access to family planning, the presence of a skilled birth attendant during delivery and emergency obstetric care<sup>3</sup>

In spite of huge efforts from the Nepal National Safe Motherhood Program, still only 35% of all births take place in a health facility. There are apparent differences between rural and urban areas: 71% of urban mothers deliver in a health facility, compared to 33% in rural areas<sup>9</sup>. Cesarean delivery rate is relatively low in Nepal with 5% in 2014<sup>10</sup>. However, the CS rate in Nepal has quadrupled in the last decade<sup>4</sup>. CS is more frequent among urban women (15%) than among the rural (3.5%)<sup>9</sup> which may reflect better access to obstetric care in urban areas. There has been recommendations that the indications for CS should be reasonably uniform and should be recognized to better understand reasons for performing it<sup>7,11</sup>.

This study aims not only to find out the delivery profile but also analyze the CS rate and its indications in a remotely situated rural hospital of Nepal.

## MATERIAL AND METHODS

This is a retrospective study done at Karnali Academy of Health Sciences Teaching hospital, which is a referral hospital situated in remote rural western hilly region of Nepal. This hospital serves not only its regular patients but also gets referrals from many surrounding districts. The hospital is equipped with many obstetricians, anesthesiologists and General Practitioners capable of doing Cesarean Section. Karnali is the only region of the country where still two districts are not connected with road access. Patients are brought to the hospital in ambulances, Human ambulances (carried in stretchers with hours of walk) and air ambulances (helicopters from those area where there is no road access).

Ethical approval was taken from Institutional Review Committee (IRC) of the Academy. The data was collected from hospital birth records from January 2016 to January 2019 and was verified from the medical record section of the Academy. The indications of CS was verified by Operating theatre (OT) record as well. These data were analyzed using SPSS version 20.

The diagnosis of different condition of the fetus and mother was made clinically and assisted with different investigative tools. Prolonged labour and non-progress of labour (NPOL) was diagnosed by pantograph, abnormal lie and presentations confirmed by ultrasonography and fetal distress by Cardiotocography (CTG) as well as presence of meconium in the Liquor.

## RESULTS

The total number of deliveries in this three-year study period was 1841 and total CS was 172 which gives a CS rate of 9.3%. Out of 172 CS done 105 women (61.5%) were nulliparas, and 67 (38.5%) were multiparas. The highest parity was 12 and the youngest mother was 17 years old. There were 2 twin pregnancies. There was no maternal death during the study period due to pregnancy and its complications.

**Table 1:** Delivery profile of past three fiscal years of KAHS

	Three years' statistics			
	2072/2073	2073/074	2074/2075	Total
Total number of deliveries	597	597	647	1841
Vaginal Deliveries	553	538	578	1669
Cesarean Section	44	59	69	172

Table 1 shows that the number of delivery was static in 2072/73 and 2073/74, however it was in rising trend in 2074/75. There was slight increase in CS rate as well. Vaginal deliveries included in this study incorporates normal vaginal as well as instrumental vaginal deliveries.

The top five indications of CS were fetal distress (33.7%), previous CS (9.3%), failed induction of labor (9.3%), Non progress of Labor (8.1%) and post term pregnancy (8.1%).

**Table 2:** Indications of Cesarean Section

Year	Three years statistics						Total
	2072/2073		2073/2074		2074/2075		
	Emergency	Elective	Emergency	Elective	Emergency	Elective	
Fetal Distress	14		23		21		58
Failed Induction	2		4		10		16
Previous CS		4		5		7	16
NPOL and Prolonged labour	3		6		5		14
Post Dated	2		7		5		14
Malpresentation		4		4		3	11
Placenta Previa	2		3		2		7
PIH with Fetal Distress	1						1
Abruptio Placenta	1						1
Hand Prolapse	1				3		4
Hydrocephalus	1						1
CPD		2		1		3	6
Obstructed Labour	2		1				3
Eclampsia	1		2		2		5
BOH				1		2	3
Chorioamnitis				1			1
IUGR					1		1
Oligohydramnious					1		1
<b>Total</b>	<b>34</b>	<b>10</b>	<b>47</b>	<b>12</b>	<b>54</b>	<b>15</b>	<b>172</b>

Table 2 shows the indication of CS in Karnali Academy of Health Sciences, Jumla. Majority of the CS were done as an emergency procedure. There was more than one indication in some cases. Indications for CS for all the cases was medical and there was no indication mentioned like maternal request. Besides above mentioned major indications, other common indication of CS includes malpresentation including breech, shoulder and face presentation. There were five cases of eclampsia who underwent CS after they were stabilized medically. Three cases of hand prolapse referred from surrounding districts with fetal death also underwent Cesarean Section. Most of the CS was done either by Obstetricians or General Practitioners. There was no recorded maternal complications. Fetal outcome and neonatal complications is out of the scope of this study.

## DISCUSSIONS

The institutional delivery rate of rural Nepal is only 33% and the CS rate is 3.5%, according to the Nepal Demographic Health Survey report 9. This study found that the CS rate in Karnali Academy of Health Sciences was 9.3%. Institutional delivery rate of Karnali is around 30% hence overall CS rate of this region comes out to be around 3.5%. Karnali region

is geographically challenging and there are very limited road access in many districts of this region. Availability and accessibility to health care facilities including antenatal checkup and institutional delivery is a major challenge in this region.

The most common indication of Cesarean Section in this study is fetal distress (33.7%) which is diagnosed on the basis of abnormal fetal heart rate pattern and many of the times confirmed by Cardiotocography (CTG). The other major indications were previous CS (9.3%), failed induction of labor (9.3%), Non progress of Labor (8.1%), post term pregnancy (8.1%) and malpresentation (6.4%). There are some studies done in similar rural setups in Nepal. A study done in Okhaldhunga Community Hospital by Samdel et al<sup>12</sup> mentions the CS rate of 9.5 % and the most frequent indications were prolonged labor in (26.4%), abnormal fetal lie (25.3%) and fetal distress (19.8%). These finding was similar to the present study. Likewise study done in Midwestern regional hospital, Surkhet by Dhakal et al<sup>13</sup> states that CS rate was 18.8% which is higher than present study whereas the main indications was fetal distress which is similar to our study. The indication of CS is similar in many other countries like Pakistan and Cambodia<sup>14,15</sup>.

**Table 3:** CS rate in different hospitals in Nepal

Hospital	CS rate
Kirtipur Hospital, Kathmandu	50.9%
Kathmandu Medical College Teaching Hospital ((KMCTH)), Kathmandu	48.8%
Patan Academy of Health Sciences (PAHS) Teaching Hospital, Patan	41.9%
PP Koirala Institute of Health Sciences (BPKIHS), Dharan	28.6%
Tribhuvan University Teaching Hospital (TUTH), Kathmandu	25.4%
Mid-Western Regional Hospital (Provincial), Surkhet	18.9%
Okhaldhunga Community Hospital (OCH), Okhaldhunga	9.5%
Karnali Academy of Helath Sciences (KAHS) Teaching Hospital, Jumla	9.3%

Table 3 compares the CS rate of different hospital of both urban and rural areas of Nepal. Large tertiary level referral hospitals of urban areas with huge population coverage like BPKIHS, TUTH and KMCTH has obvious reasons for higher rate of CS as they receive many complicated cases referred from different parts the country. Hospitals situated in rural area with less population and low institutional delivery rate like OCH and KAHS teaching hospital understandably has lower CS rate.

There has been some discussion regarding ethical aspects of too high CS rate especially in private clinics/hospitals as CS is financially beneficial for hospitals' income compared to vaginal deliveries<sup>7</sup>. This is seen in studies in Switzerland where private clinics had a CS rate of 41% compared to 30.5% in public hospitals<sup>16</sup>. It is suggested that similar differences may have in urban areas of Nepal<sup>7</sup>. The issue of CS done for economic benefit without medical indication in some private hospitals has been raised recently. There should be global guidelines on recommended CS rates, and the indications need to be identified so that the rate of unnecessary CS can be minimized<sup>12</sup>. Health workers in low-income and middle-income countries should be trained in how to avoid cesarean sections and how to perform them<sup>1</sup>. We recommend further studies to look into different hospitals' CS rates and indications.

## CONCLUSION

Cesarean section rate in a referral hospital situated in a remote area was 9.3%. This rate is within the range of recommendation by WHO (10% - 15%) and the main indications of CS was fetal distress, previous CS, non-progress of labor, failed induction of labor and post term pregnancy. There was no CS done for maternal request. The CS rate was low in comparison to the large referral hospitals of urban areas.

## REFERENCES

1. Rijken MJ, Meguid T, van den Akker T, et al. Global surgery and the dilemma for obstetricians [letter to the editors]. *Lancet*. 2015;386:1941–2
2. Irani M, Deering S. Challenges affecting access to cesarean delivery and strategies to overcome them in low-income countries. *Int J Gynaecol Obstet*. 2015;131(1):30–4.
3. UN. UN millenniumgoal 5. [http://www.un.org/millenniumgoals/pdf/Goal\\_5\\_fs.pdf](http://www.un.org/millenniumgoals/pdf/Goal_5_fs.pdf). Published 2013. Accessed 04 Dec 15
4. Prakash KC, Neupane S. Cesarean deliveries among Nepalese mothers: changes over time 2001–2011 and determinants. *Arch Gynecol Obstet*. 2014;289(2):421–7
5. World Health Organization. World health statistics 2015. <http://apps.who.int/iris/bitstream/10665/170250/1/9789240694439> Published 2015. Accessed 24 Sept 2015.
6. Karkee R, Lee AH, Khanal V, et al. Obstetric complications and cesarean delivery in Nepal. *Int J Gynaecol Obstet*. 2014; 125(1):33–6.
7. Irani M, Deering S. Challenges affecting access to cesarean delivery and strategies to overcome them in low-income countries. *Int J Gynaecol Obstet*. 2015;131(1):30–4.
8. World Health Organization. Monitoring emergency obstetric care. <http://whqlibdoc.who.int/publications/2009/9789241547734> Published 2009. Accessed 18 Mar 2015
9. United Nations. UN millenium goals. <http://www.un.org/millenni umgoals/>. Published 2015. Accessed 24 Sept 2015
10. Ministry of Health and Population; New Era; ICF International. Nepal Demographic and Health Survey 2011. <http://dhsprogram.com> Published 2012. Accessed 5 Feb 2015.
11. World Health Organization. World health statistics 2014. <http://apps.who.int/iris/bitstream/10665/112738/1/9789240692671>. Published 2014. Accessed 14 Mar 2015
12. Robson MS. Can we reduce the caesarean section rate? *Best Pract Res Clin Obstet Gynaecol*. 2001; 15(1):179–94.

12. Live Johnna Samdel et.al: Indication of cesarean section in rural Nepal The Journal of Obstetrics and Gynecology of India (September–October 2016) 66(S1):S284–S288 DOI 10.1007/s13224-016-0890-2
13. Dhakal et al... Keshar Bahadur Dhakal,Sulochana Dhakal,Saroj Bhandari: Profile of Caesarean Section in Mid-Western Regional Hospital in Nepal J Nepal Health Res Counc 2018 Jan-Mar;16(38):84-8
14. Ehtisham S, Akhtar Hashmi H. Determinants of caesarean section in a tertiary hospital. J Pak Med Assoc. 2014; 64(10):1175–8.
15. Viphou N, Brook AJ, Liljestrand J. Clinical indications for cesarean delivery in a Cambodian referral hospital. Int J Gynaecol Obstet. 2014; 124(1):83–4.
16. Organisation for Economic Co-operation and Development. Health at a glance 2013: OECD indicators. <http://www.oecd.org/els/health-systems/Health-at-a-Glance-2013.pdf>. Published 2013. Accessed 5 Feb 2015.