

Cesarean Section Trend and its Correlates in Nepal: A Mini-Review

Aliza KC Bhandari^{1*} and Ashmita Adhikari²

¹St. Luke's International University Graduate School of Public Health, Tokyo, Japan

²Maharishi Markandeshwar Deemed to be University, Bengaluru, India

Abstract

Cesarean Section (CS) is the important indicator of emergency obstetric care performed to save maternal and fetal lives by preventing complications during labor. This study aimed at identifying the trend of CS over two decades in Nepal and also find out its correlates. National demographic and health survey (NDHS) data from the year 1996, 2001, 2006, 2011 and 2016 were used for this study. Bivariable and multivariable logistic regression models were performed to find the trend and correlates of CS over time. Results showed that the rate of institutional-based CS has increased by 4% within these two decades from about 10.4% (95% CI: (8.9-11.6) %, $p < 0.01$) in 1996 to 16.4% (95% CI: (14.5-18.5) %, $p < 0.01$) in 2016. Government institutions showed no bigger change however private institutions had significant 3-fold rise in the rate of CS from 1996 to 2016. With the light of increasing CS on private institutions and on certain sub-groups of the population (richest, well educated) government should find a way to implement programs focusing on maternal and child health care accessibility and equity over each sub-group of the population.

Keywords: Cesarean section; Nepal, Institutional deliveries; C-section

Introduction

Cesarean Section (CS) is a surgical procedure widely performed to save maternal and fetal lives in order to save them from various complications of labor [1]. However, the rate of CS is alarmingly increasing throughout the world with the maximum rate observed in Latin America (40%) followed by Northern America, Oceania, Europe and Asia with the least being observed at the most deprived region, Africa (7.3%) [2]. What is the appropriate rate of CS has been the issue of debate since ages however, WHO emphasizes that the rate of CS above 10% is not associated with a decrease in maternal or fetal adverse outcomes like Maternal Mortality Rates (MMR) and neonatal mortality Rates (NMR) [3]. Factors associated with CS are vague and depends on each country or state however, higher maternal age, having larger than average sized baby, well-educated mother, higher economic status of mother, place of delivery and so on has been found to be associated with CS [4-6].

Nepal government has shown a great success in reducing the MMR and had achieved the Millennium Development Goal (MDG) of reducing the MMR by 50% by 2015 and this has been possible because of the introduction of various maternal and child health (MCH) programs like safe motherhood program, Aama Surakshya Program, SBA training programs and so on. Government also provided incentives of about (5-10) US dollars to women who delivered their baby in an institution. These programs are supposed to have played the role of a catalyst for the achievement of MDG on MCH [7-9]. However, various studies have shown that there are several existing disparities in Nepal based on ethnicity, socioeconomic status and even the area of residence due to which the rate of CS has been highly affected. For a developing country like Nepal which is still facing the burden of MMR of 281 deaths per 100,000 live births knowing the trend of CS and finding its correlates might be an opportunity to explore ideas on reducing this rate up to negligible proportion. Hence, the objective of this study is to find out the trend of CS in Nepal over the period of 20 years and identify the factors associated with CS.

Methods

This study analyzed NDHS data obtained from DHS department of USAID from the year 1996 to 2016 in Nepal. DHS conducts population

representative survey in every five-year interval in Nepal like that of many other developing nations by multi-stage cluster sampling design and uses census ward as a primary sampling unit (PSU) [10]. Among 53,484 women aged 15-49 years this study only included 20,824 women as they had information on our outcome variable (CS).

We included independent variables like age at first birth, religion, education, occupation, wealth index, BMI, province, residence, number of antenatal care (ANC) visits, and place of delivery and size of baby. We conducted a bivariable analysis followed by multivariable analysis using logistic regression analysis. We used sample weight in our analysis since this is a survey analysis and also used "svy" command to account for clustering of the survey data. Due to the low count of CS rates in 1996 and 2001, we only utilized the data from other three surveys for our multivariable analysis. We got the approval to analyze these data from DHS after we sent our proposal to them on May 2019 and DHS has got ethical rights to share their data among researchers once reviewing their proposal.

Results

About 20,824 women were analyzed in this study and among them maximum were in between 20-29 years and Hindus. The proportion of educated women increased by 4-times while we moved from 1996 to 2016. Majority of women belonged to urban areas by 2016 and had normal BMI. Similarly, more than 70% belonged to average or higher wealth quintiles in 2016 and the rate of facility-based delivery increased from 0.9% in 1996 to 62% in 2016. The rate of ANC visits also increased drastically throughout the years.

The population-based CS increased from 0.9% in 1996 to 10.2% in 2016 whereas institutional-based CS increased by 4% during these two decades from about 10.4% (95% CI: (8.9-11.6) %, $p < 0.01$) in 1996

***Corresponding author:** Aliza K C Bhandari, St. Luke's International University Graduate School of Public Health, Tokyo, Japan, E-mail: 18mp204@slcn.ac.jp

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to 16.4% (95% CI: (14.5-18.5) %, $p < 0.01$) in 2016 and this trend was statistically significant. Furthermore, private institutions had about 3-fold rise in CS rate, 8.9% in 1996 (95% CI: (4.8-16.0) %) to 26.3% in 2016 (95% CI: (21.9-31.3) %). Our multivariable analysis showed that the area of residence (development regions), wealth index, education, age at first birth, birth order, child size, ANC visits and place of delivery were significantly associated with CS (Figure 1).

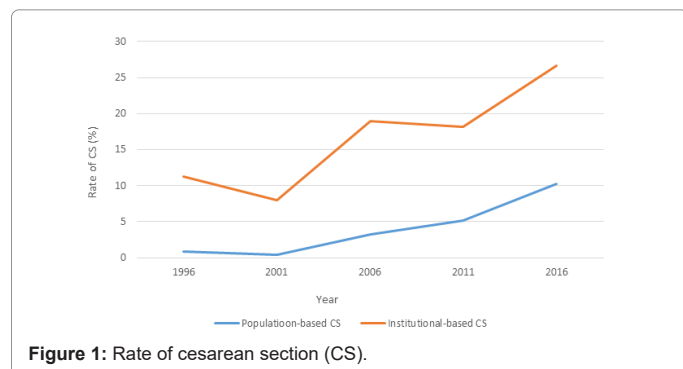


Figure 1: Rate of cesarean section (CS).

Discussion

The study highlighted the increasing trend of institutional-based CS in Nepal from 1996 to 2016. This rise in the rate of CS might be reflecting the success story of Nepal government in achieving the MDG goals on reduction of MMR by 50% by 2015 [11]. The various programs safeguarding the maternal and child health in Nepal like safe motherhood program, SBA training programs and Aama Surakhshya program might have played an important role in achieving this success in Nepal. Some other developed countries like Australia, Germany, Italy and Denmark has far higher rate than this [12]. However, for a developing country was the MMR is still on rise the current trend seems to be a positive outcome for Nepal.

Similarly, this study found some similar correlates as mentioned by other studies conducted in Nepal and other countries. However, the rate of CS was highly variable in between the sub-groups of the population. The women with higher socioeconomic status like higher educational level, higher wealth quintile and living in a highly privileged area with advanced health care system had significantly higher CS rate than those with lower education, lower wealth quintile and residing in underprivileged area. The geographical structure of Nepal has a crucial influence on health service accessibility and utilization as people living in some remote areas cannot access the health care facilities as most of them are concentrated in bigger cities of the country [13,14]. Hence, even with the upward trend of institutional deliveries there are still significant number of women who are obliged to have home deliveries because of several hindrances and are prone to have several maternal and fetal complications arising by unsafe home delivery or unattended deliveries.

This study was conducted using five DHS data hence, could be generalized to the overall population of Nepal. It has also highlighted the trend of CS and its correlates over two decades hence, the facilitate Nepal government to plan their strategies on reducing MMR based on the results of this study. However, since DHS did not contain data on implications of CS we were not able to identify the exact medical reasons due to which the CS has been performed. Even though this is the limitation of this study, it provides a comprehensive data analysis on CS and has included some important analysis that could help Nepal government in the near future.

Conclusion

There was a substantial rise in the rate of CS over the period of 20 years in Nepal focusing on the improvement in the maternal and child health sector. Several health programs conducted by Nepal government to promote MCH services seemed to be effective in Nepal. However, the increasing disparity within the sub-groups of the population and a low rate of CS among public institutions might be suggesting a need for improvement. Nepal government should focus on providing MCH services equally to the underprivileged group and should decrease the existing gap in between various sub-groups of the population so that everyone can have equal access to maternal and child health care services.

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Disclosure Statement

The authors declare no conflict of interest.

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