Factors Affecting Trends of Cesarean Section: A Review

Sunita Byanjankar1*     Bin Yu2
1.School of Clinical Medicine, Inner Mongolia University for the Nationalities, 536 West Huo Lin He Street, Horqin District, Tongliao City, Inner Mongolia, China
2.Affiliated Hospital of Inner Mongolia University for the Nationalities, 1742 Huo Lin He Street, Horqin District, Tongliao City, Inner Mongolia, China

Abstract

Cesarean section rate is rising in both developing and developed countries. The reason for the increase is multifaceted. The clinical and non-clinical factors have explained the wide variation in cesarean delivery rates between and within countries. Changes in maternal characteristics and professional practice styles, increasing malpractice pressure, as well as economic organizational, social and cultural factors have been implicated in this trend. The higher rate of CS is a complex and multidimensional phenomenon. Therefore, programs and interventions should be introduced to decrease the rate of CS like painless vaginal delivery, emotional and educational interventions, improved quality of safe normal vaginal delivery in both private and public settings as well as the change in maternal and professional attitude towards the choice of mode of delivery.

Keywords: Cesarean section, cesarean delivery on maternal request, advanced maternal age, maternal socioeconomic status, education level, maternal obesity

1. Introduction

In modern era, the commonly performed surgery in obstetrics is a Cesarean section (CS). When adequately indicated, can prevent poor obstetric outcomes and be a life-saving procedure for both the mother and the baby (Cavallaro et al, 2013). In 1985, World Health Organization (WHO) published a guideline, which stated that cesarean birth rates should be less than15 percent, which was, based on data from developed countries signifying that no extra benefit to the maternal-neonatal outcomes when the rate exceeds this level (Lancer et al, 1985). CS has become more prevalent in recent years without any medical rationalization and regardless of the risk; it may bring to mother and the children born by CS. In many studies, identified the socioeconomic factors like maternal education, residence, maternal age as well as medical indications like gestational hypertension, fetal weight, fetal mal-position which led to CS delivery (Tian et al, 2010; Zhong et al, 2014).

Scientific progress and the availability of modern health technology, increase in access to and use of antenatal care services, especially in private health institutions and in particular, legal changes have led to fundamental change in attitude towards CS among patients and doctors explains the rise in CS rate. Whereas, on the other hand, there is growing evidence of CS on demand for personal and cultural reasons, particularly in profit-motivated institutes (Hu et al, 2016; Hopkins et al, 2000; Wagner et al, 2000).

According to United Nations geographical grouping in 2014 CS rates in Africa 7.3% (Eastern Africa 3.9%, Middle Africa 5.8%, Northern Africa 27.8%, Western Africa 3.0%), Asia 19.2% (Eastern Asia 34.8%, South Central Asia 11.4%, South Eastern Asia 14.8%, Western Asia 26.8%), Europe 25.0% (Eastern 23.7%, Northern 22.4%, Southern 30.7%, Western 24.5%), Latin America and the Caribbean 40.5% (Caribbean 27.5%, Central America 38.2%, Southern America 42.9%), Northern America 32.3% and Australia/New Zealand 32.3% respectively (Betran et al, 2016).

The purpose of this article is to review the factors associated with the rise of CS rate and to determine the relation between indications, maternal age, maternal obesity, socioeconomic status and education level with the selection of CS delivery as well as reasons and prevalence rate of CS rate in private and public hospitals.

2. Factors associated with the rise in CS:

2.1. Major indications for CS

The rationale behind the decision for CS is entirely based on the question whether it is best for the mother and the children or may save lives of both (Mylonas et al, 2015). In the studies reviewed, the most frequently reported indications were; cephalo-pelvic disproportion (CPD), fetal distress, prior cesarean, dysfunctional labor and elective CS (Vega et al, 2015). Among these indications, the majorities are maternal indications and only a few are fetal indications (Liu et al, 2014). The indications are different among the countries and health sector, for example in a retrospective study done in India, increase in primary CS and repeat CS rates were reported and primary CS was done for fetal distress, arrest of decent and fetal indications whereas repeat CS was done for scar tenderness, arrest of labor both dilation and decent and CPD. Whereas, the study done in Chinese population by Liu et al found Cesarean Delivery on Maternal Request (CDMR) was the commonest indication for CS followed by CPD, fetal distress, previous CS delivery, mal-presentation, macrosomia and other indications (Mittal et al, 2014; Liu et al, 2014). In some reviewed literature dystocia, CPD, presumed fetal distress, high risk of uterine...
rupture, mal-presentation, antepartum hemorrhage and maternal/fetal compromise were indications (Meda et al, 2016; Nelson et al, 2017) whereas previous CS was the commonest indication in a study done in Israel (Chu et al, 2012) and CPD was commonest in Cameroon (Lurie et al, 2016).

2.2. Cesarean Delivery on Maternal Request (CDMR)
CDMR, defined as a primary pre-labor cesarean delivery on maternal request without any maternal or fetal indication (Tanyi et al, 2016), one of the major cause of increasing CS rate. Based on the WHO global survey in 2010 on maternal and perinatal health in Asia, China had the highest rate of CS of 46.25, with an 11.7% rate performed without medical indications (ACOG 2013). In a study done in China, 24.7% requested for CS, women who choose CS were elderly, obese, women with sexually transmitted diseases, large fetus and those conceived with assisted conception (Liu et al, 2017; Liu et al 2015). In a cross-sectional survey done in Nigeria, 39.65% respondents were aware of CDMR (Okonkwo et al, 2012), and the reasons were fear of labor pain, fear of the poor fetal outcome, fear of urinary and fecal incontinence and emotional aspects which are similar to survey done by Lener-Geva et al and R Shaboiea et al (Lerner et al, 2015; Shahoei et al 2014). In the study by Bagheri et al in 2013, they stated that the prenatal anxiety is a risk factor for choosing CS without any medical indications (Bagheri et al, 2013). In some studies reviewed, women who conceived after fertility treatment always demand CS (Ghotbi et al, 2014). Widespread myths like baby delivered by CS is smarter, the head shape is better, women’s body shape and pelvic floor will be better protected by CS and certain dates of birth are more auspicious are factors associated with increased demand CS (Okby et al, 2016).

2.3. Advanced maternal age and parity
Maternal age at delivery has increased during recent decades, as has the rate of CS (Schantz et al 2016). In the articles reviewed, a clear relationship between the age and method of delivery was observed. Women with 35 years or older are considered to have a higher incidence of obstetric complications and adverse pregnancy outcomes than the younger pregnant women (Ngowa et al, 2013). Furthermore, maternal co-morbidities such as gestational diabetes, hypertension as well as have 30% chance of preterm delivery, decreased fetal birth weight and stillbirth which increases the rate of CS particularly in low and middle-income countries (Herstad et al, 2016; Bayrampour et al 2010). Padwe et al showed that advanced maternal age is associated with elevated risks of pregnancy complications like gestational diabetes, preeclampsia and antepartum hemorrhage and increased rate of assisted conception in India (Pawde et al, 2015), was supported by Rendtorff R et al study in which CS rate was increased to 59% in elderly women when compared to younger mothers (Rendtorff et al, 2017) and Lisonkova et al study in which and repeat CS were common in older age women (Lisonkova et al, 2017). Oakley L et al in a study found that maternal age between 35-39 years and nulliparous have CS relative risk (RR) 4.67, with multiparous RR 2.85 and maternal age >40 years with nulliparous, RR 8.23, with multiparous RR 3.75 respectively (Oakley et al, 2016).

2.4. Socio-economic status (SES) and maternal education
Frequently, the differences in maternal health access are more pronounced in different socioeconomic groups within each country. This review is done for assessing whether SES is associated with the rising rate of CS. The CS is associated with higher familial income per capita, higher education, lower residential crowding, pregnancy planning and advanced maternal age (Khan et al, 2017). A study carried out in Bangladesh, demonstrated that women from poorer and poorest households reported lower use of CS at around 30%and 54% respectively, whereas the use of CS was 1.32 times and 2.33 times higher among the richer and richest households who generally choose private hospitals where frequency of CS is higher which was similar to the study done in Finland [Cury et al, 2017; Raisanen et al, 2014]). In México, the pregnant women belonging to high socioeconomic level was associated with 44 % more chance of cesarean regarding low stratum (OR = 1.44, 95 % CI: 1.12-1.83) and women within the medium and high social classes were attended only in private hospitals and 85.07% of these women underwent to a CS (Lopez et al, 2013).

Maternal scholar degree was considered as a factor associated with the election of the delivery method in this review. The trend among some studies reviewed shows directly proportional relationship between cesarean section and a higher educational level. In Brazil women with higher maternal educational level (+12 years), showed a cesarean prevalence of 77.2% (Barros et al, 2012). Whereas, in a study done in Germany, 41.5% of women with the tertiary degree have low health access compared to 56% vocationally educated women and 52% least educated women. But, only 24.4% tertiary degree women have CS compared to 30% vocationally educated and 39.15 least educated women (Kottwitz et al, 2014).

2.5. Maternal Obesity
Al-Kubaisy et al. in 2014 in a study stated maternal obesity is defined as women who have body mass index (BMI) >30kg/m2 at first antenatal visit. It is calculated by dividing pre-pregnancy weight in kilograms (kg) by
height in meter-square (m²). In their study, they concluded that the significant number of obese primigravida or multigravida with no history of CS in current pregnancy had CS thus significant (Alkubaisy et al., 2014). A study done in Ghana demonstrated that women with obesity had six-fold increased the risk for pregnancy-induced hypertension (RR 6.17), chronic hypertension (RR 6.00) and fetal macrosomia (RR 2.52) leading to two-fold increased the risk of CS (RR 2.20) (Linden et al., 2016). An article in Spain studied that the risk of obstructed/non-progressive labor, failed induction for labor, fetal distress and CS due to previous CS are greater in overweight and obese women than in normal-weight pregnant women leading to increased rate CS. The main reason for failed induction is the lower contractile response in obese women (Fernandez et al., 2016). Tetsuya Kawakita et al in a study found that the rate of primary CS in normal weight women is 15.8% compared to obese women whose is 50.8% and the indications are failure to progress, CPD, fetal macrosomia were indications for primary CS that increase with increasing obesity but the percentage of non-reassuring fetal heart did not increase with increased obesity (Kawakita et al., 2016).

2.6. CS prevalence in public and private hospitals
Practically, the worldwide health system is divided into public and private hospitals with specific characteristics according to the country (Vega et al., 2015). The difference in CS rates at public and private maternity hospitals are either due to differences in preference of patient mode of delivery or the difference in prenatal and delivery care between these two settings that could influence the delivery outcome (Karlstrom et al., 2011). In a study done by L Benova et al, the rate of CS in private facilities in Asia, Middle East Europe, Sub Saharan Africa and Latin America were 66%, 49%, 23% and 13% respectively, which is higher than that in public hospitals (Benova et al., 2015). F. Ghotbi et al in a study showed that rates of CS in private and public hospitals were 91.9% and 78.5% respectively and the most common reason was non-reassuring fetal heart rate pattern (Ghotbi et al., 2014). Mazzoni et al found rates of CS 43.7% in private sectors and 34.7% in public hospitals and the frequent indication was labor arrest in both sectors (Mazzoni et al., 2016). A. Arrieta et al in which they explained that rise in CS rates in private hospital may be due to doctors in public hospitals have the fixed salary, whereas, physicians in private settings work under fee for service scheme. Because CS pays more and requires less time per birth than vaginal birth, the fee for scheme creates incentives, to over utilize CS (Arrieta et al., 2011). The study done by Sepehri et al was consistent with previous research articles the risk of having CS in private facility was greater than in public hospital by 36-38% in India and Indonesia and by as much as 130% in Bangladesh (Sepehri et al., 2017).

3. Conclusion
As discussed above, the high rate of CS is a complex phenomenon associated with maternal, neonatal and social factors. Therefore, the programs and interventions should be introduced to modify both patient preference and professional attitude towards the mode of delivery. Emotional and educational interventions, improved quality of normal vaginal delivery and painless labor should be introduced in both private and public hospitals to lower CS rate. Maternal awareness regarding social beliefs like elective CS is safer than vaginal delivery for mother and baby as well as prenatal education to make them aware regarding complications of CS and their consequences in the future pregnancy such as ectopic scar pregnancy, placenta previa, cicatricial diverticulum. Additionally, obese women should be considered as high risk and educational programs on weight control, medical and psychological counseling to pregnant women should be done in primary care sectors to reduce their weight.

4. Conflict of Interest
All contributing authors declare that they have no conflict of interest.

Reference


