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The Effect of Implementing Guidelines and Changing Practices on Caesarean Section Rates in A Tertiary Care Hospital in Islamabad

Zeba Munzar, Jaweria Faisal*, Ayesha Basharat*, Rakhshanda Aslam

Department of Gynecology, Fazaia Medical College Islamabad Pakistan, *Department of Gynecology, Al Nafees Medical College Islamabad Pakistan

ABSTRACT

Objective: To evaluate the effect of implementation of guidelines and changing practices on caesarean sections rates at Al Nafees Medical College Hospital without compromising fetal or neonatal morbidity and mortality.

Study Design: Prospective Analytical study.

Place and Duration of Study: Department of Obstetrics, Al- Nafees Medical College Islamabad, Pakistan, Jan 2012 to Jan 2017.

Methodology: All 1593 patients who underwent cesarean sections during the study period were enrolled. Data was divided into yearly periods for comparison and analysis. Sampling technique used is convenient sampling. New labor management guidelines were implemented along with regular audit and feedback in Jan 2014. Delivery statistics were compared before and after implementation of these guidelines.

Results: Rate of caesarean sections decreased from 36.4% (94 out of 258 births) in 2013 to 24.5% (125 out of 510 births) in 2016 after changing practices and implementation of guidelines. Primary cesarean section rate decreased from 54% (84 out of 155 births) in 2013 to 22% (70 out of 310 births) in 2016. Vaginal birth after cesarean section increased from 17.3% (11 out of 62 births) in 2013 to 68% (62out of 90 births) in 2016. There was no increase in fetal, or neonatal morbidity or mortality during this period.

Conclusion: Caesarean section rate was safely lowered our teaching hospital when we changed the clinical practices of the doctors and paramedical staff using supervision, audits, feedbacks and clear clinical guidelines.

Keywords: Caesarean Section, Delivery, Labor, Vaginal Birth after Cesarean, Neonatal Morbidity, Neonatal Mortality.

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INTRODUCTION

In many cases cesarean section is life-saving for both mother and baby.[1] However, there has been a public health concern about the increasing caesarean section rates in many countries including Pakistan. Pakistan Demographic and Health Surveys (1990–2018) has shown an increase in caesarean deliveries from 3.2% in 1990–91 to 19.6% in 2017–18, with the rate being as high as 64.7% in some hospitals.[2,3] Many of these were performed unnecessarily, including nonevidence-based indications, economic gains, professional convenience, and maternal requests.[4] High cesarean rates are of concern because they expose the mother and child to short-term and long-term health risks and impose a financial burden on families and health systems.[5]

Risks associated to a mother due to caesarean section include infection, longer period to healing, potential complications as placenta previa, placenta accrete spectrum in subsequent pregnancies.[6] The infants have an increased time of separation from mothers delivered by cesarean sections and are more likely to experience transient tachypnea along with persistent pulmonary hypertension.[6] Decreasing cesarean births by increasing vaginal operative deliveries should not be the goal; rather strategies should be implemented to increase spontaneous vaginal births.[7]

Standardized fetal heart-rate monitoring and continuous labor-and-delivery support can help reduce primary C-section rates.[8] Vaginal birth and an intact perineum with a healthy baby are achievable goals for most women. There is an urgent need to continue to identify strategies to reduce cesarean births.[9] Reduction in caesarean section births has been a goal of World Health Organization, WHO advocates a rate of no more than 15% of all births in an institution.[10]

The aim of our study was to implement guidelines and make changes in clinical practices with the prospect of seeing a downward trend in cesarean section rate at our tertiary care hospital.

Correspondence: Dr Zeba Munzar, Department of Gynecology, Fazaia Medical College Islamabad Pakistan

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METHDOLOGY

This prospective analytical study was conducted at Al- Nafees Medical College Islamabad, Pakistan, between January 2012 and January 2017 after permission from the Hospital Ethical Review Committee (letter no. F.2/IUIC-ANMC/EC-239/2020).

Inclusion Criteria: All patients who underwent caesarean section or delivered after a trial of labor after previous cesarean section during our study period were included.

Exclusion Criteria: All patients who had a normal delivery either first, or after previous normal deliveries were excluded.

All patients meeting our inclusion criteria were enrolled in this study, which came to 1593 women. Yearly data was maintained including demographic and obstetric profiles, number of patients who underwent cesarean sections, indications of cesarean sections, number of primary cesarean sections, vaginal births after cesarean sections, number of stillbirths, record of perinatal mortality and admissions to the neonatal intensive care unit (NICU).

Guidelines on changing practices were implemented in 2014, which included proper antenatal care under supervision of consultants with emphasis on dating of pregnancy, new standard care protocols for management of labor and induction of labor with special emphasis on induction not before 41 weeks in postdates pregnancy unless indicated due to medical reasons. Another important action was the establishment of a policy about cesarean sections; elective cesarean sections without medical indications were only permitted after 39 weeks. All cases where women were not in labor or when they were below the requisite gestational age needed approval of the senior consultant. Women with a history of previous cesarean section were encouraged to undergo a trial of vaginal delivery unless it was contraindicated.

Presence of responsible doctors on the floor was ensured along with trained staff for monitoring of labor and conducting normal and instrumental deliveries according to proper guidelines, along with round the clock availability of anesthetist and neonatologist.

Courses, workshops and different technical trainings focused on childbirth were held regularly including practices related to instrumental delivery, cardiotocography, breech delivery, postpartum hemorrhage, shoulder dystocia, eclampsia and neonatal resuscitation.

There was day-to-day supervision by senior consultants with regular feedbacks from doctors and midwives working in the department. Meetings with professionals were held on monthly basis for sharing their experiences and aiming at continuous improvements in their skills. There were regular monthly and yearly audits where the rates of vaginal deliveries and cesarean sections, primary cesarean sections and vaginal births after cesarean sections were reviewed. Cesarean section rates were calculated by dividing the total number of patients undergoing cesarean sections by the total number of deliveries by 100. Primary cesarean section rate by dividing the number of women having a first cesarean delivery divided by number of women having vaginal birth without previous cesarean section. Vaginal birth after caesarean delivery (VBAC) rate was calculated by dividing total number of women who had VBAC by sum of patients having VBAC and repeat cesarean sections.

Statistical Package for Social Sciences (SPSS) version 25 was used to analyze data. Rates of C-sections over a 5-year period were assessed, data before the implementation guidelines (January 2012 to January 2013) was compared with data after the implementations of guidelines (January2015 to January 2017) by using Chi square test. Mean±SD calculated for quantitative variable and frequencies and percentages were calculated for qualitative were calculated. A p-value <0.05 was considered significant.

RESULTS

During the study period (January 2012 to January 2017), a total of 1,593 patients were enrolled, the out of these 1177 had vaginal deliveries and 416 patients underwent caesarean sections, giving an overall caesarean rate of five years of 35.5%.

The demographic and obstetric profiles of those undergoing cesarean sections analyzed in the study were similar, no significant variation in characteristics of study population was observed during the 5 years of the study. The mean age of the patients was 31.1±5.87 years and average gestational age was 38.5±2.01 weeks. (Table-I).

Indications of caesarean sections (Table-II) remained nearly the same in all five years, with little difference. Incidence of breech caesarean delivery remained the same 6.4% in 2012 to 5.7% (4/69) in 2016.

There no cesarean was done due to maternal request over this period. The difference in the averages in the periods was statistically significant (p<0.002).

Primary cesarean section rate also showed a significant decline after implementation of guidelines and changing practices in 2014, it was 58% (72 out of 105 births) in 2012 and 22% (70 out of 310 births) in 2016.

The number of patients who delivered vaginally after a previous cesarean section showed an increase after changing practices in 2014, it was 29.5% (20 out of 45 births) in 2012, 17.3% (11 out of 62 births) in 2013 and it increased to 68% (62 out of 90 births) in 2016 Figure-1.

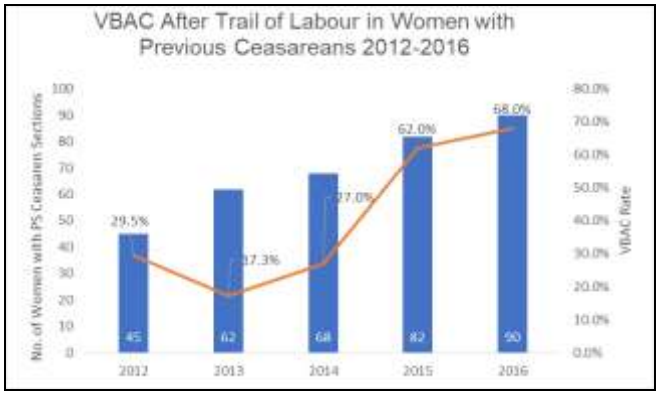

Figure-1: Vaginal Birth Rates in Women after Trial of Labor in Previous Cesarean Sections

Regarding neonatal outcomes, there was no significant difference in the stillbirths perinatal mortality and NICU admissions across all 5 years of the study Table-III.

DISCUSSION

The increase in C-section rates to over 30% in many countries is of great concern as it increases risks for both women and their newborns.[12] We realized that many cesarean sections were done in the hospitals without proper indications and proper dating, increasing the admissions of newborns in nursery with respiratory distress, hence an initiative was taken in our setup to curtail the rising rate of these surgeries.

The hospital where this study was conducted, started working in 2012. For the first two years the number of patients who underwent cesarean sections remained high. In 2014, a senior consultant was employed who took the initiative to take major steps to decrease cesarean rate. According to Marie B, conscientious obstetricians around the world spend a great deal of time justifying the reasons for increasing cesarean section (CS) rates, they also put a lot of effort to find ways to reduce the rate if it is considered high.[13] Abishek *et al*. believed in promoting normal birth and from sustained organizational commitment to this philosophy, thus shaping obstetricians' views, which are important for determining CS rate.[14] In our study, doctors in the department along with the staff nurses and LHVs were similarly motivated, trained and then constantly supervised by a senior consultant to maintain their commitment to reduce surgical deliveries.

Other important contributors to reach the objective of reducing abdominal deliveries included involving the administration, hiring new medical and nursing staff, on-floor availability of round-the-clock pediatrician and anesthesiologist. Moreover, implementation of measures and guidelines that

Table-I: Demographic and Obstetric Profiles of the Patients undergoing Cesarean Section (n=419)

Year	2012 (n = 31)	2013 (n= 94)	2014 (n= 59)	2015 (n=110)	2016 (n= 125)
Maternal age in years(Mean ± SD)	30.6±4.4	30.0±4.8	30. 7±4.6	30.7±5.1	30.6±5.07
Gestational age in weeks (Mean ± SD)	38.5±1.7	38.4±1.2	38.3±1.4	38.5±1.9	38.5±1.85

Table-II: Cesarean Section Rates over the Study Period (January 2012 to January 2017) (n=1593)

Year	2012 (n=190)	2013 (n=258)	2014 (n=285)	2015 (n=350)	2016 (n=510)	p-value
Cesarean sections	31(16.3%)	94(36.4%)	59(20.7%)	110(31.5%)	12(24.5%)	0.002

Table-III: Perinatal mortality, Stillbirths, Admissions in NICU (n=?)

Parameters	2012	2013	2014	2015	2016	p-value
Perinatal mortality (per 1000 births)	26(13.6%)	29.2(11.3%)	27(9.4%)	21(6%)	16(3.1%)	0.14
Stilldbirths	6(3.15)	7(2.7%)	8(2.8%)	5(1.4%)	2(0.39%)	0.29
Admissions in NICU	56(29.4%)	52(20.1%)	65(22.7%)	78(22.2%)	80(15.6%)	0.11

changed practices personnel working in the department brought down the cesarean rate and there was an increase in the number of non-instrumental vaginal deliveries without increasing adverse neonatal outcomes.

According to Aron *et al*., rates of cesarean section surgery are rising worldwide due to interventions such as inductions, and pre-labor caesarean sections, women who have previously had a cesarean section are an increasingly important determinant of overall cesarean rates, strategies to reduce frequency of this procedure should include avoidance of unnecessary primary cesarean sections. Careful selection of cases for inductions and pre labor cesarean sections can also reduce the increasing cesarean rate.[8] In our hospital, similar efforts were made to avoid unnecessary inductions, post-dates pregnancy were not induced before forty-one weeks, pre-labor cesareans were discouraged unless absolutely indicated like primi-breech, antepartum hemorrhage, fetal compromise, special efforts were also made to decrease the primary cesarean rate.

According to Nils *et al*., cesarean section rate can be safely reduced by interventions that involve modifying practices of health workers working in the department. He suggested that multifaceted strategies including audit and detailed feedback should be advised to improve clinical practice and effectively reduce cesarean section rates. Moreover, identification of barriers to change is a major key to success.[15] Similarly, we also conducted regular audits which helped us modify our practices and also to identify the barriers to success.

Demographic and health surveys of Pakistan 1990-2018 showed that trends of cesarean sections are increasing in our country over the past two decades, they recommend that the health system in Pakistan should provide clear medical guidelines to doctors for carrying out caesarean section deliveries.[16] Implementation and adherence to these guidelines is definitely an appropriate mean to decrease the caesarean rate.[15] We also introduced clinical guidelines which did decrease the CS rate of our department.

Another strategy involved correct interpretation of results of electronic fetal heart rate monitoring during labor by the obstetric care teams leading to inconsistent decision-making. One study launched an electronic fetal monitoring training program for the nurses, midwives and doctors, using the best available evidence in an effort to help standardize interpretation.[17] Similarly, in our setup interpretation of cardiotocography was standardized, the non-reassuring traces of fetal heart were interpreted with caution by the senior consultants on call.

A large proportion of CS were undertaken for the indications like previous CS, failure to progress and fetal distress, management of such patients are a key to determining the overall cesarean section rates.[18] The decision to carry out each and every cesarean section in our department was taken after discussion with senior consultants. This avoided unnecessary surgeries for indications like fetal distress and failure to progress. One very important aspect was that none of the cesareans were done on maternal request, for this the patients were constantly motivated during their antenatal checkups especially those with one previous cesarean to take a trial of VBAC.

A number of articles have been written on decreasing caesarean section rates all over the world but few have been written in our country which has a totally different infrastructure of the health services, different cultural and social values, our research has been specially designed to meet the needs of the patients coming to our maternity units, this article can be beneficial for the obstetricians who want to decrease the ever increasing cesarean scars in a population, most of which is deprived of safe health services.

LIMITATIONS OF STUDY

The study had some limitations, including retrospective nature of the data analysis, since it was a new hospital so the total number of patients was not sufficient in the initial years but gradually increased in number. Most the patients were from a low socioeconomic background, they were not regular in their antenatal checkups therefore counselling of the women prior to delivery could not be properly carried out

CONCLUSION

Caesarean section rate was safely lowered our teaching hospital when we changed the clinical practices of the doctors and paramedical staff using supervision, audits, feedbacks and clear clinical guidelines.

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Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

ZM & JF: Conception, study design, drafting the manuscript, approval of the final version to be published.

AB & RA: Data acquisition, data analysis, data interpretation, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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