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Original Research Article

Recent trends of interventions in labor management at a tertiary care hospital

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ABSTRACT

Background: Aim of the study were to identify the changing trends in labor management in terms of rate of cesarean section (C-section), rate of trial of labor after C-section (TOLAC), rate of primary and repeat C-section, rate of episiotomy in primi and multi-gravida and percentage contribution of red cell concentrate (RCC) to total blood transfusion.
Methods: The data was collected retrospectively for every year at SSG hospital, Baroda from 1st January 2014 to 31st December 2022. C-section rate was calculated per annum in percentage, which was again split into primary and repeat C-section rate. Leading indications for primary C-section were identified. Rate of total episiotomy, in primigravida and multigravida, trends of RCC transfusion rates and its contribution to total blood products were estimated. Appropriate statistical tests were applied to check level of significance.
Results: C-section rate contributing to total confinements increased from 30.76% in 2014 to 37.6% in 2022, which was statistically significant. Contribution by primary C-section has decreased but repeat C-section has increased over these years. Common indications for primary C-section included fetal distress, MSL, breech presentation, non-progression of labor etc. Overall rate of episiotomy has increased from 41% in 2104 to 54.4% in 2022, with decrease in primigravida and increase in multigravida over these years but these rates are not significantly changed. Contribution of RCC to total transfusion significantly decreased from 76.1% in 2014 to 66% in 2022.
Conclusions: Rate of total and for repeat C-section are increasing with time, so TOLAC and other strategies to reduce primary C-section should be focused upon. Episiotomy must not be routine and should be given when indicated only. Interventions to reduce requirement of blood transfusion must be strengthened. New oral and parenteral iron preparations should be accepted based on evidences.

Keywords: Recent trends, C-section, TOLAC, Transfusion

INTRODUCTION

This study is about changing trends of interventions at labor room for management in terms of C-section, trial of labor after C-section, rates of episiotomy, perineal tear, instrumental delivery etc. It is based on observations of the authors and standard departmental protocols. Obstetrics is a dynamic area of medicine which requires continuous efforts and innovations for wellbeing of mother and child. Obstetrics welcomes new areas of research for betterment of services provided to mother and child while adhering to standard care protocols. Interventions done in the labor room are in changing trends for past few years and these changes are to be understood to implement good care efforts and to identify loopholes in care-giving.

Many contributors are there for these changing trends like increased rate of institutional deliveries, increased number of private practitioners, literacy, and awareness among patients, respect to women's choices, increased age at conception, higher prevalence of medico-legal issues, availability of C-section, high acceptance among patients etc.[1]

Aim

Aim of the study was to identify the changing trends in labor management in terms of rate of C-section, rate of TOLAC, rate of primary and repeat C-section, rate of episiotomy in primi and multi-gravida, percentage contribution of RCC to total blood transfusion.

Objectives

Objectives were to identify possible areas of improvement, possible ways of better intervention and implement evidence-based research to routine labor management.

METHODS

Study design

It was a retrospective observational study.

Study setting

The study was conducted at Baroda medical college, SSG hospital affiliated to MS university.

Study duration

The duration of study was 8 years, from 1st January 2014 to 31st December 2022.

Data collection

Data were obtained from medical records in terms of per annum total confinements, total number of C-section, total number of successful TOLAC, total number of episiotomies, also in primi and multigravidas, total number of perineal tears and their degree wise segregation, total number of instrumental deliveries, total number of blood product transfusion and the component wise segregation etc.

Statistical analysis

Year wise quantitative variables were compared using difference of proportion test. Significance level was fixed at 5%.

Statistical analysis was performed using Medcalc version 12 or other equivalent software.

RESULTS

Difference between 2014 and 2022, rate of primary C-section has decreased with statistical significance with $p<0.05$ (by application of difference of proportion), while between 2014 and 2022, rate of repeat C-section has increased with statistical significance with $p<0.05$ (by application of difference of proportion).

Common indications for primary C-section are mainly fetal distress, meconium-stained liquor associated with fetal distress, pathological CTG, breech presentation, non-progression of labor.

Rate of instrumental delivery was 0.5% in 2014 (24 forceps and 7 vacuum) and was 0.14% in 2021 (2 forceps and 7 vacuum).

Table 1: Percentage contribution of C-section to total confinements.

Year	Total confinements	Total C-section	C-section rate (%)
2014	6873	2014	29.3
2015	7200	2366	32.9
2016	7044	2433	34.5
2017	7070	2420	34.2
2018	7157	2678	37.4
2019	7996	2860	35.8
2020	7388	2705	36.6
2021	6471	2371	36.6
2022	7511	2822	37.6

Applying 'difference between two proportions' test between C-section rate of 2014 and 2022, the test is statistically significant with $p<0.05$.

Table 2: Contribution of primary and repeat C-section to total C-section rate.

Year	Primary C-section rate (%)	Repeat C-section rate (%)
2014	70.9	29.1
2015	68.1	31.9
2016	70	30
2017	72.1	27.9
2018	69.8	30.2
2019	72	28
2020	64.8	35.2
2021	65.4	34.6
2022	62.0	38.0

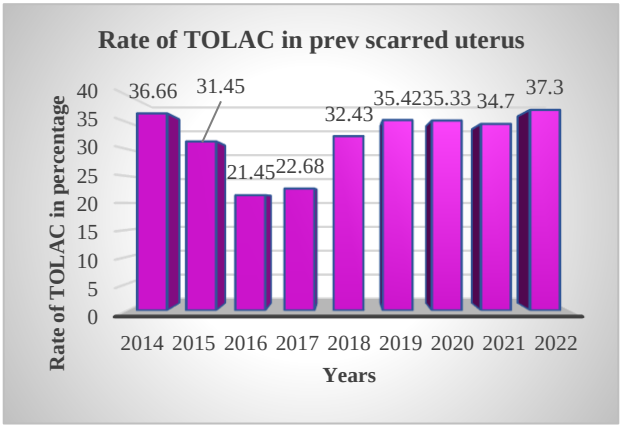

Figure 1: Rate of TOLAC in previously scarred uterus.

By applying difference of proportion between TOLAC rate of 2014 and 2022, the p=0.99 which was more than 0.05, so the test was not statistically significant.

Table 3: Percentage contribution of repeat C-section for previous C-section.

Year	Previous 1 C-section	Previous 2 C-sections	Previous ≥ 3 C-sections
2014	80.4	19.3	0.3
2015	84	15.5	0.5
2016	79.1	17.6	3.3
2017	82.7	15.7	1.6
2018	83	14.7	2.3
2019	79.4	18.4	2.2
2020	75.7	22.5	1.8
2021	79.1	20.4	0.5
2022	82.9	16.0	1.2

Table 4: Rate of episiotomy and its association with gravidity.

Year	Episiotomy rate (%)	Rate in primigravida (%)	Rate in multigravida (%)
2014	41	91.9	8.1
2015	47.6	71.1	28.9
2016	52.9	66.2	33.8
2017	58.9	68.4	31.6
2018	64.1	60.4	39.6
2019	61	61.8	38.2
2020	59.6	68	32
2021	59.1	67.5	32.5
2022	54.4	61.0	39.0

With application of difference of proportion test, total episiotomy rate-not significant (p=0.85 which is >0.05), episiotomy rate in primigravida-not significant (p=0.61 which is >0.05) and episiotomy rate in multigravida-not significant (p=0.61 which is >0.05).

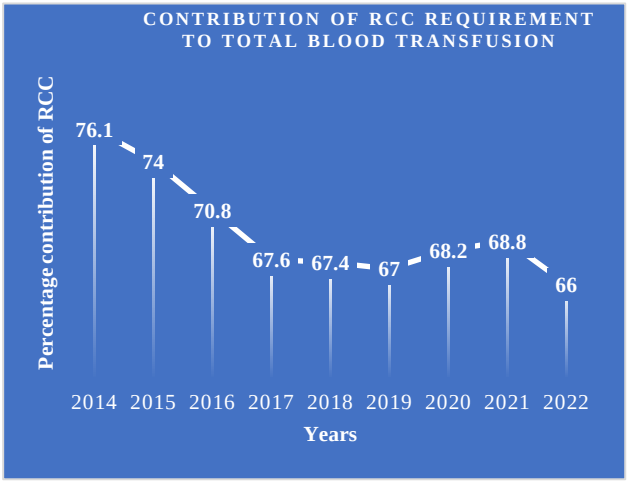

Figure 2: Total blood transfusion requirement and component-based requirement.

Perineal tear rate was 9.8%_(94.5% being 1st or 2nd degree tear, rest being 3rd or 4th degree) in 2014 which increased to 11.1% (96.2% being 1st or 2nd degree, rest being 3rd or 4th degree) in 2021 and the result is not significant with p value of more than 0.05.

RCC requirement decreasing from 76.1% in 2014 to 68.8% in 2021.

Use of whole blood has decreased over time, while the use of individual blood components for specific indications like RCC, PC (platelet concentrate), FFP (fresh frozen plasma), SDP (single donor platelet), cryoprecipitate etc.

DISCUSSION

In our study, rate of C-section has increased, rate of primary C-section has decreased, rate of repeat C-section has increased, rate of C-section for previously scarred uterus is almost similar, rate of successful TOLAC is almost unchanged with significant decrease in the middle part of this study duration. Rate of episiotomy has increased. Rate of episiotomy in primigravida has decreased, while in multigravida has decreased. Rate of perineal tear over this study period is almost unchanged. Rate of instrumental delivery has fallen.

Contribution of RCC requirement to total blood requirement has decreased, but overall use of blood components as intervention has increased. While comparing to other studies,

Betran et al in they represented data from 154 countries over 9 years and they reported C-section rate of 21.1% with steady increase of C-section rate over period.[2]

In Simmons et al concluded that C-section rates have substantially increased over time and was 44% in private facility while 34% in public facility.[3]

Goyal et al did a study and concluded commonest indications were CPD, malpresentations, fetal distress and previous C-sections in this order and revealed the rising trend of repeat C-section because of previous caesarean.[4]

In Michelle et al study and concluded that the primary cesarean delivery rate fluctuated from 2016 to 2019. After increasing to 21.9% in 2017 (from 21.8% in 2016), the rate decreased in 2018 (21.7%) and 2019 (21.6%). The rate then increased 1% in 2020 (back up to 21.9%) and 2% in 2021 (22.4%). In comparison, repeat cesarean delivery rate declined each year from 2016 to 2021. For 2016-2019 rate declined average of 0.6% per year, from 87.6% to 86.2%, then declined an average of 0.2% for 2020-2021 to 85.9%.[5]

Marmitt et al did a study on recent trends of C-section in Brazil and concluded the prevalence of C-section increased from 51.2% in 2007 to 61.2% in 2013, while from 2016 to 2019 this occurrence decreased (from 54.0% to 48.9%, respectively).[6]

Goueslard et al did a population-based study in France on how episiotomy rates change from 2007 to 2014? And concluded that episiotomy rate decreased from 26.7% in 2007 to 19.9% in 2014. For non-operative deliveries, this rate fell from 21.1% to 14.1%. This decreased rate of episiotomy was attributed to selective use of episiotomy rather than routine use.[7]

Ye et al did a nationwide cross-sectional survey of episiotomy practice in China and concluded that episiotomy rate was 41.7% in nullipara and 21.5% in multipara in China. Pre-pregnancy BMI, maternal diseases and obstetric factors are associated with episiotomy.[8]

National trends in utilization of episiotomy and factors associated with high-utilization centers in the United States were evaluated by ava Mandelbaum et al and they stated that rate of episiotomy decreased from 19.5% in 2005 to 5.3% in 2016 with a $p<0.001$ and also concluded that as compared to white women, black women had lesser episiotomy rates while Asian women had higher episiotomy rates.[9]

Teixeira et al did a nation-wide register-based study 'time trends in episiotomy and severe perineal tears in Portugal over 15 years from 2000 to 2015 and stated that rate of instrumental delivery was 20.6%, from which 76.7% were with episiotomy and 0.56% were complicated by severe perineal tears.[10]

Singh et al studied changing trends of blood transfusion requirement in obstetrics and gynaecology and stated that common indication for blood transfusion in obstetrics were anemia near term, post-partum haemorrhage, ante-partum haemorrhage and incomplete abortion.[11]

Xie et al did an observational study 'incidence, trends and risk factors for obstetric massive blood transfusion in China from 2012 to 2019' and stated that incidence of obstetric massive blood transfusion was 23.68/10000 maternities which was on rising trend.[12]

Chawla et al studied blood transfusion practices in obstetrics over one year period in 2016 and told that total 32 women from total 2423 deliveries received transfusion. Total 79 packed red blood cells (PRBC), 66 units of FFP, 12 units of RDP and 3 units of SDP with no massive blood transfusion was done.[13]

A study on transfusion practice in obstetric haemorrhage in a tertiary care center was done in 2018 by Fazal et al and finalized that 81.2% were transfused PRBC, 43.7% received PC transfusion, 48.1% received FFP transfusion and 14.2% received cryoprecipitate.[14]

CONCLUSION

Strategies like encouragement of TOLAC, judicious use of NST, scalp blood pH monitoring, avoiding unnecessary induction of labor with prostaglandins, promotion of instrumental delivery and assisted vaginal breech delivery, use of labor care guide, breakage of the myth 'Once a caesarean always a caesarean', use of Robson's data grouping, clinical audit, antenatal care coverage, screening of anemia in adolescents, reproductive age females and pregnant women, use of adequate (at least 180 days antenatal and 180 days postnatal) oral iron, widespread use of parenteral iron, coverage with albendazole, trial of warm compresses at perineum, good perineal support intrapartum and antenatal perineal exercise, Intrapartum use of ultrasonography, Not being too much conservative for lithotomy position, alternative birthing position and labor exercises, no routine use of episiotomy etc must be encouraged to ensure mother and neonatal well-being with least possible intervention. Interventions capable of posing least risk to mother and baby should be grown up.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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