EFFECTS OF SHORT INTER-DELIVERY INTERVAL ON MODE OF DELIVERY IN PREVIOUS ONE CAESAREAN SECTION CASES

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ABSTRACT

OBJECTIVE: To determine the effects of short inter delivery interval (IDI) on mode of delivery in patients with immediate previous one caesarean section (C-Section).

METHODS: This is a retrospective chart review of 120 patients treated at Khyber Teaching Hospital, Peshawar, Pakistan from December 2017 to December 2019. Patients of previous one C-Section and with gestational age of >37 weeks were included in this study. Outcome variables were mode of delivery whether operative or vaginal delivery, maternal and fetal complications such as scar dehiscence or scar rupture and fetal distress.

RESULTS: Mean age of the patients was 28.9±2 years. IDI was <18 months in 35/120 (29.2%) cases, 18-24 months in 54/120(45%) cases and >24 months in 31/120 (25.8%) cases. Out of 120, 102 (85%) patients underwent trial of labour after C-section (TOLAC). TOLAC was successful in 64 (62.7%) cases. Patient who underwent TOLAC with IDI of <18 months, 5/21 (23.8%) patients delivered vaginally and 16/21 (76.2%) patients had emergency C-Section while those with 18-24 months IDI, 38/51 (74.5%) patients delivered and 13/51 (25.4 %) patients had emergency C-Section. Main indications for emergency C-Section were scar tenderness and maternal tachycardia (n=16; 42.10%) and fetal distress (n=11, 28.9%). There were two cases of interauterine deaths. Uterine scar dehiscence was observed in 14.28% and 2.4% in short and normal IDI respectively.

CONCLUSION: Patients with short IDI had high C-section and uterine scar dehiscence rate. IDI of >18 months is recommended to avoid the maternal and fetal morbidity and mortality.

KEYWORDS: Birth Intervals (MeSH); Pregnancy (MeSH); Inter-pregnancy Interval (Non-MeSH); Inter delivery Interval (Non-MeSH), Vaginal Birth after Cesarean (MeSH); Trial of Labour after Cesarean (TOLAC) (Non-MeSH); Cesarean Section (MeSH); Scarring (MeSH); Maternal tachycardia (Non-MeSH); Fetal Distress (MeSH).

INTRODUCTION

Globally, cesarean section (C-Section) is a common procedure in obstetric care with frequency ranging between 25 to 50%.[1-3] A previous C-Section is known to be one of the strongest risk factors for uterine rupture in the following delivery.[4] Incidence of uterine rupture among women with previous one C-Section is 0.5-0.9% compared to 0.2% in without any history of section.[5] Multiple factors influence this risk. Induction of labour, labor dystocia, short inter-pregnancy interval (IPI), macrosomic fetus, maternal height less than 160 cm and age more than 35 years are all known to increase the risk.[6,7]

IPI is defined as "the time that has elapsed between the date of the previous delivery and the first day of the last normal menstrual period for the index pregnancy".[8] Optimal IPI more than 8 months and optimal inter delivery interval (IDI) more than 18 months is important determinant of natural health and optimal pregnancy outcomes. Uterine scar dehiscence and rupture is a recognized complication of short IPI in patients with scarred uterus. The interval between two consecutive pregnancies is a significant risk factor for safety of vaginal birth after cesarean (VBAC). However, this issue is not clearly addressed due to lack of sufficient studies. Short IPI causes less wound healing and increases the risk of rupture uterus at the scar site as myometrial tissue rejuvenates very slowly because slow production of fibroblasts and replacement of myometrium by connective tissue. Ultrasound studies and hysteroscopic evidences show that previous scar healing is incomplete between 6-12 months after C-Section. Short IPI and short birth spacing is also linked with greater risk of perinatal and infant mortality, preterm births, low birth weight and fetal growth restriction. Other maternal effects are anemia, preterm labour, placental abruption and increase incidence of placenta Preavia.[1,9]

In Pakistan, limited studies have been conducted on short IPI & IDI, mainly addressing the perinatal outcome.[10,11] As rate of C-section is rising in Pakistan,[12] there is a need to address the effects of short IDI in patients having previous C-section. We planned this study to determine the effects of short IDI on mode of delivery in patients with immediate previous one C-Section in Khyber Teaching Hospital Peshawar, Pakistan.

METHODS

This retrospective observational hospital-based study was carried out in Department of Gynae and Obstetrics, Khyber Teaching Hospital Peshawar, Pakistan from December 2017 to December 2019.

TABLE I: TRIAL OF LABOUR AFTER C-SECTION OUTCOME (TOLAC) IN THE STUDY PARTICIPANTS (N=102)

Inter Delivery Interval	Successful TOLAC	Failed TOLAC	Total (n=102)
<18 months	5 (23.8%)	16 (76.2%)	21
18 - 24 months	38 (74.5%)	13 (25.4 %)	51
> 24 months	21 (70%)	9 (30%)	30
Total	64 (62.7%)	38 (37.3%)	102

Data of patients who had immediate last delivery as C-Section and with gestational age of more than 37 weeks, admitted during the study period were retrieved for inclusion in this study. The study included 120 patients who had immediate last delivery as C-Section. Sample size was small because of following strict inclusion and exclusion criteria. Patients with previous classical C-Section or with prior transmural myomectomy, breech or other fetal malpresentation, poly hydramnios, patients with medical morbid conditions like diabetes, preeclampsia, hypertension, cardiac, renal diseases or patients having obstetrical conditions such as antepartum hemorrhage, cephalopelvic disproportion or conditions contradicting labour progression were excluded from the study.

After approval of synopsis, data was collected on a structured proforma where all the necessary patient's data including clinical details such as gestational ages, parity, booking status, IDI, previous vaginal deliveries, indication of previous C-Section and Bishop scoring were recorded. Data on outcome variables including mode of delivery whether operative or vaginal delivery, maternal or fetal complications such as scar dehiscence or scar rupture and fetal distress was collected. A thorough counseling regarding risks and benefits of trial of labour after cesarean was done and informed consent taken from the patients.

Induction of labour done in two patients with full preparation for emergency C-Section. Labour progress was recorded on a partogram. Trial of scar given with strict vigilance for scar tenderness, uterine contraction, vaginal bleeding and fetal heat rate monitoring. Facility of operation theatre and anesthesia and pediatrician were made available. Short

IPI is defined as interval between prior delivery and conception less than 8 months and short IDI defined as interval between delivery less than 18 months.

In few cases, ultrasounds were performed to ascertain presence of uterine scar dehiscence (showing scar thickness < 3.5 mm) at 36-38 weeks of gestation. All data was entered and analyzed through SPSS 23. Mean±SD determined for quantitative variables like age and parity. Frequency and percentage calculated for short IPI and uterine scar dehiscence.

RESULTS

Data of 120 patients who had immediate last delivery as C-Section during the study period was analyzed. Mean age of the patients was 28.9±2 years and the mean gestational period was 37.6±2 weeks. Majority (n=56, 46.6%) of patients were multipara, followed by primiparas (n=38, 31.6%) and grand multiparas (n=26, 17.5%) respectively.

IDI was less than 18 months in 35 (29.2%) cases, 18-24 months in 54 (45%) cases and more than 24 months in 31 (25.8%) cases.

There were two cases of interauterine deaths. They were induced with a single

tab of prostaglandin E2 vaginal tab. One patient had successful VBAC and in other patient induction failed. So, she underwent emergency C-Section.

Out of 120 patients, 102 (85%) patients underwent trial of labour after C-section (TOLAC) and 18 (15%) patients refused trial and opted for C-Section. Out of 102 patients, TOLAC was successful in 64 (62.7%) cases and failed in 38 (37.3%) cases. Patient who underwent TOLAC with IDI of <18 months, 5/21 (23.8%) patients delivered vaginally and 16/21 (76.2%) patients had emergency C-Section while those with 18-24 months IDI 38/51 (74.5%) patients delivered and 13/51 (25.4 %) patients had emergency C-Section (Table I).

Out of 38 cases of failed TOLAC, most common indications of emergency C-section were Scar Tenderness & Maternal Tachycardia in 16 (42.1%) cases and fetal Distress in 11 (29%) cases (Table II).

Out of these 18 patients who refused TOLAC, 9 (50%) patients had IDI <18 months, other indication for refusal of trial of scar were bad obstetric history, secondary infertility, cord around neck and reduced amniotic fluid index. In patients with short IDI, 3 (14.28%) had uterine scar dehiscence while (2 2.4%) scar dehiscence seen in patients with normal IPI.

DISCUSSION

WHO technical consultation on birth spacing in 2005 recommended that IPI of 24 months reduce the risk of adverse maternal, perinatal and infant outcomes.[13] This interval was constant with the recommendation of breast feeding for 2 years. The society of obstetricians and gynecologists in Canada 2005 showed that IDI of more than 18

TABLE II: INDICATIONS OF EMERGENCY CESAREAN (FAILED TOLAC) IN STUDY PARTICIPANTS

Indications	Frequency (n=38)	Percentage
Scar Tenderness & Maternal Tachycardia	16	42.1
Fetal Distress	11	29
Failed Labour Progress	6	15.7
Vaginal Bleeding	2	5.3
Prolonged Latent Phase	2	5.3
Failed Induction	1	2.6

months had the lowest risk for uterine rupture.[14]

Scar dehiscence is highly co-related with short IPI. Nazima, in a study on 150 patients of previous one C-Section, found that 63 (42%) patients had short IPI of less than 8 months while 87 (58%) had normal more than 8 months IPI.[11] In patients with short IPI 6 (95%) patients had scar dehiscence while with more than 8 months IPI 2 (2.3%) patients had scar dehiscence showing significant impact of short IPI on uterine scar dehiscence. In the study, out of 120 patients 35 (29.16%) patients had IDI of less than18 months, 54 (45%) patients presented with 18-24 months and 31 (25.8%) patients had IDI of more than 24 months. Our findings correlate with the above study.

The research in the area suggests that mostly it occurs in patients having low parity. In Niazi N, et al study mean age was 31.94, mean gestational age 37.2±2.8, primiparas were 50 (33%), multiparas 41 (27%) and grand multis 37 (25%).[11] In our study, mean age is 28.9±26, mean gestational age 37.6±2, prim paras were 31.6%, multi paras 46.6% and grand multi paras 17.5%. Similarly, Seema Patel concluded that maximum number of patients with successful VBAC's (80.5%) were having ages 21-30 years. With the increasing age chances of VBAC decreased.[15]

In our study patients who underwent TOLAC with IDI less than 18 months 23.8% patients delivered and 76.2% patients had emergency C-Section. While those with 18-24 months IDI, 74.5% patients had normal vaginal delivery and 25.4% patients had emergency C-Section.

In our study main indications for emergency C-Section were scar tenderness a maternal tachycardia 42.10%, fetal distress in 28.9% and failure of progress of labour in 15.7% cases. Ramadan concluded that in 27 cases of uterine scar dehiscence the factors which were significantly associated with the scar dehiscence were preterm delivery and short IDI.[16] Shrestha S, et al concluded that in 534 cases of previous one C section 91 (17.04%) patients had repeat C section (RCS).[17] Main indication for repeat C-section were recurrent causes 12 (14.6%), patients with short IPI and were not in labour opted for elective C section

24 (29%). While other causes were fetal distress 6 (7.3%) scar tenderness 6 (7.3%), failed VBAC's 5 (6%), other indications were fetal malpresentations, PIH, IUGR.

In our study in patients with IDI <18 months undergoing TOLAC 3 patients (14.28%) had scar dehiscence while 2 (2.4%) patients with normal IDI > 18-24 months had scar dehiscence. Bujold E, et al concluded that IDI < 18 months and single layer closure significantly increases the risk of uterine rupture.[18] Short interpregnancy interval is significantly associated with increased risk of scar dehiscence. Bujold in his study found similar findings. He conducted a study on 1768 females with previous one C-Section found that 74.8% of patient had IDI > 25 months, 14.5% had 18-23 months and 10.6% had IDI < 18 months. Uterine rupture occurred in 1.3%, 1.9% and 9.8% of cases respectively.[19]

In Nissa Q, et al study of 1018 patients with previous one C-Section, trial of vaginal delivery was given to 223 (21%). Among them 93 (91.7%) had repeat emergency C-Section.[19] TOLAC rate in her study population is low in comparison to rates reported in literature (37-80%). Because majority of un-booked referred cases with previous one C-Section did not had record of previous C-section like indication and type of uterine incision. Most of the time patients were operated by inexperienced surgeon in periphery and second important factor was short IPI. This made decision of trial of scar difficult.

Short IDI leads to incomplete fibrosis of uterine scar. A study that evaluated the incision healing after cesarean delivery using MRI reported that at least 6 months were needed for zonal anatomy of uterus to recover.[20] It is therefore suggested that women with previous one C-Section should be advised to wait at least 12 months before conceiving again. Ultrasound examination and hysteroscopy findings of uterine scar detected that previous scar healing is incomplete between 6-12 months after C-Section.[21] This improper healing leads to very thin uterine segment and thus has the high probability of rupture during trial of labour. Taizoon S, et al., concluded in her study that the cut off value of lower uterine scar thickness range between 2-5–3.5 mm and above this value the chances of uterine rupture during labor is

less likely.[22] She found out that factors associated with uterine scar rupture during labour included induced labors, number of lower segment C-section, short IPI, prior vaginal delivery, gestational age, and fetal birth weight.[22]

CONCLUSION

Patients with short IDI had high C-section and uterine scar dehiscence rate. Uterine scar dehiscence and rupture is a recognized complication of short IPI in patients with scarred uterus. In our study 14.28% patients with short IDI had uterine scar dehiscence while 2.4% seen in patients with normal IDI. IDI of >18 months is recommended to avoid the maternal and fetal morbidity and mortality.

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

TM: Conception & study design, analysis and interpretation of data, drafting the manuscript, critical review, approval of the final version to be published.
AA & SJ: Acquisition of data, drafting the manuscript, 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.