

Maternal and neonatal outcomes in adolescent pregnant women with one prior Cesarean section in Baghdad

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Abstract

Objective: Repeat adolescent pregnancy is a hot topic worldwide and imposes a challenge on the health system, especially when faced with limited resources. We aimed to assess maternal and neonatal outcomes in adolescent pregnant women with one prior cesarean section (CS).

Material and Methods: Singleton adolescent pregnant women with one prior CS scar were recruited and divided into two groups based on the obstetric decision for delivery and/or mother's wish, either trial of labor (TL) or elective cesarean section (ECS). If TL failed, an emergency CS was performed.

Results: Out of the total 109 involved women, TL and ECS groups included 78 (71.6%) and 31 (28.4%) women, respectively. Emergency CS was done for 57 (52.3%) women from the TL group, leaving only 21 (19.3%) women with successful TL who had statistically significant (non-recurrent) indications of the prior CS [12 (57.1%)]. Malpresentation (n=24; 77.4%) was the major indication in the ECS group, while fetal distress (n=29; 50.9%) was the main cause of failed TL. Total maternal morbidities in the TL group were significantly higher for adjusted [1.5 (1.1-4.2)] and non-adjusted odds ratios (OR) [2.4 (1.6-5.6)]. Neonatal complications, such as admission to neonatal intensive care unit, were higher in the TL group without reaching significance. However, the adjusted OR [1.9 (1.1-3.3)] for perinatal asphyxia was significantly increased in TL group.

Conclusion: Maternal morbidities and perinatal asphyxia were significantly higher in the TL group of adolescent women compared with the ECS group in this study. (J Turk Ger Gynecol Assoc 2023; 24: 86-91)

Keywords: Adolescent, complications, pregnancy, previous cesarean section

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Introduction

The rate of surgical delivery by cesarean section (CS) has increased globally, and this is especially true in our part of the world in the Middle East (1).

The term adolescent pregnancy is used when the pregnant woman is aged ≤ 19 years. The rate of adolescent pregnancy is increasing now throughout the world including the United States and Europe, and not limited to the third world and developing populations (2,3). In general, there are increasing

rates of adolescent pregnancy reaching as high as 27%, while different cultures and different countries may report some variation in the incidence (4).

It may be clinically challenging to manage the delivery of an adolescent woman having a prior CS scar. Trial of labor (TL) is an apparent good option, but there are many limitations related to the wide range of preferences of obstetricians and adolescent women. Although it is well known that TL in a previously scarred women may reduce future CS rates, the situation in adolescents this is not clear due to a lack of



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published data. It is estimated that more than half of women with a single previous scar of CS have successful TL rates. Again, limited data is available in adolescents (5,6).

Risk of comorbidities in TL, especially uterine rupture, still constitutes a major concern. Contrasting opinions are offered, either to encourage or discourage TL in resource-limited settings due to the expected complications of the pregnant women and their newborns (5,7,8).

Since we have a high local rate of first CS in adolescents (48.96%) (8), we planned to examine if concerns regarding TL were justified in adolescent pregnant women having a single prior delivery with CS in comparison to an elective cesarean section (ECS) approach in Baghdad city by evaluating maternal and neonatal outcomes.

Material and Methods

This work was conducted between the start of May, 2019 and the end of April, 2022 in an obstetric department of Baghdad Teaching Hospital at Medical City Complex. All full-term singleton para one pregnant women with one previous CS and aged ≤ 19 years old who presented for labor were included. This hospital acts as a tertiary referral center for complicated and high-risk deliveries from all other parts of the country.

Exclusion criteria were:

- 1) No, or more than one previous CS delivery;
- 2) former single CS delivery but with any one or more of: multiple pregnancy; antepartum hemorrhage; emergency CS before labor onset; chronic disease (such as hypertension and diabetes); and/or missing data.

Recruited women were divided into two categories, TL or ECS. The decision to apply either TL or ECS was made by the attending obstetrician according to the hospital guideline (like post-date pregnancy) and/or mother's wish. Intrauterine growth retardation, fetal presentation other than cephalic, multiple pregnancy, genital herpes disease, and former myomectomy were considered contraindications to TL. Newly delivered babies were examined by the attending neonatologist.

The partogram was used to look after involved women and a continuous monitoring of the fetal heart using a sonic aid was done with regular checking of uterine tenderness, vaginal hemorrhage, and liquor staining. Artificial rupture of membranes was the standard approach to augment labor without use of oxytocic medications due to uterine rupture risk. Labor was not induced. TL had to be terminated and an emergency CS was performed when tenderness was felt at the previous scar site, partogram went over the action line, and fetal distress was suspected (which was defined as meconium-stained liquor, and fetal heart rate <110 /minute, >160 /minute, or decelerated). Perinatal asphyxia was identified when 5 minutes Apgar score was <6 . Low birth weight (LBW) was considered

if the weight was within the range of 1.5-2.5 kilograms, and very LBW newborn was defined as <1.5 kilograms (9-11).

Women were monitored at the hospital for 24 hours after vaginal delivery and 72-96 hours after non-complicated CS delivery.

Detailed medical history was obtained by the attending obstetrician, including sociodemographic information, antenatal care visits (ANC), medical diseases (current or previous), previous CS, and perinatal outcomes.

Statistical analysis

Statistical Package for the Social Sciences version 25 was used to compare TL and ECS groups (IBM Inc., Armonk, NY, USA). Chi-square test and Student's t-test were utilized to analyze categorical and continuous data, respectively. The normality of distribution of the data was examined using the Shapiro-Wilk test. Maternal and gestational age, regular ANC, period of inter-delivery, and indication of prior CS delivery were evaluated as confounding and interacting parameters. No significant correlation was revealed among these covariates. Logistic regression analysis (multivariate) was used to investigate the covariates. Adjusted parameters including odds ratios (OR) and 95% confidence intervals were derived from the regression coefficients. A p-value ≤ 0.05 was assumed significant.

Results

The total number of adolescent pregnant women presenting during the study period was 586, and after exclusions 109 women with only one prior CS were recruited. Of these, 78 (71.6%) were given a TL (TL group), and 31 (28.4%) were chosen to have an ECS group. Out of TL group, 57/109 (52.3%) women had failure of TL and delivered by an emergency CS. The net result was 21 (19.3%) women delivered vaginally, and 88 (80.7%) had a cesarean delivery (Figure 1).

Women in the TL group were slightly younger at 18.12 years versus 18.42 years in the ECS group and also had later gestational age (37.4 vs 36.9 weeks) and more regular ANC. Furthermore, compared to ECS women, TL women were more likely to have consanguineous marriage and non-recurrent indication of previous CS, but less months of inter-delivery period (Table 1). Women with successful TL had significantly more (non-recurrent) indications for the prior CS than women with failure of TL [12 (57.1%) vs 20 (35.1%), $p=0.02$], while unknown indications were significantly more common in the failed TL group [19 (33.3%)], as shown in Table 2.

Table 3 shows the main causes of TL failure [fetal distress was the main cause "29 (50.9%)"], and ECS indications [malpresentation revealed to be the major one "24 (77.4%)"].

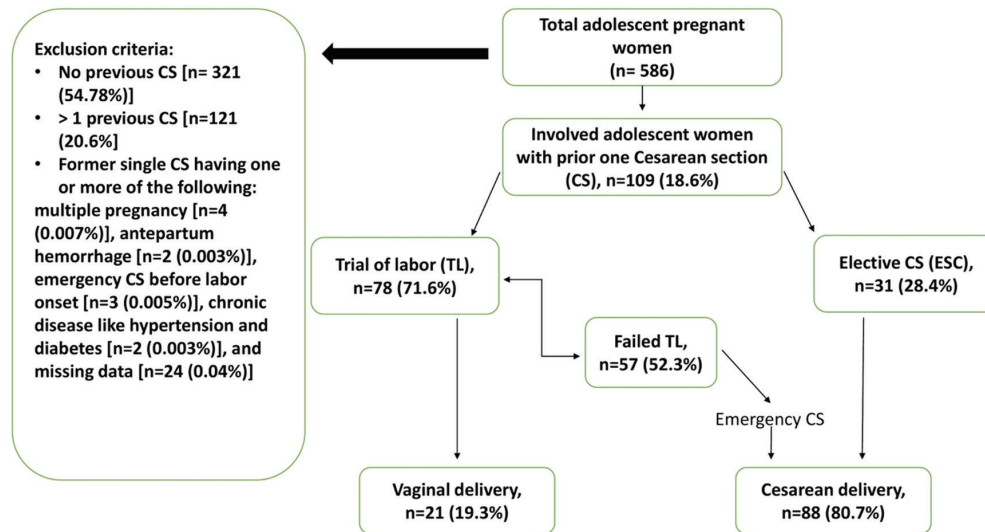


Figure 1. Scheme of participants
ECS: Elective cesarean section

Table 1. General characteristics of involved women

| Maternal parameter | TL group, n=78 | ECS group, n=31 | OR (95% CI) |
|---|----------------|-----------------|---------------|
| Age (years)* | 18.12±3.16 | 18.42±1.76 | 0.6 (0.4-1.3) |
| Gestational age (weeks) on delivery* | 37.4±3.1 | 36.9±2.9 | 1.3 (0.2-2.7) |
| Regular antenatal care | 35 (44.9%) | 11 (35.5%) | 1.8 (1.4-3.2) |
| Educational level** | | | |
| Literate | 62 (79.5%) | 24 (77.4%) | 1 |
| Illiterate | 16 (20.5%) | 7 (22.6%) | 0.9 (0.2-1.8) |
| Occupation** | | | |
| Housewife | 68 (87.2%) | 26 (83.9%) | 1 |
| Employed | 10 (12.8%) | 5 (16.1%) | 0.8 (0.5-1.6) |
| Consanguinity | 33 (42.3%) | 12 (38.7%) | 1.4 (0.7-2.1) |
| Parity** | | | |
| One | 44 (56.4%) | 16 (51.6%) | 1 |
| Two | 22 (28.2%) | 10 (32.3%) | 0.7 (0.2-1.5) |
| ≥3 | 12 (15.4%) | 5 (16.1%) | 0.9 (0.3-2.2) |
| Indication of prior Cesarean section** | | | |
| Recurrent | 25 (32.1%) | 17 (54.8%) | 1 |
| Non-recurrent | 34 (43.6%) | 6 (19.4%) | 3.7 (2.5-6.3) |
| Unknown | 19 (24.4%) | 8 (25.8%) | 0.9 (0.5-1.9) |
| Period of inter-delivery of previous Cesarean section (months)** | | | |
| ≤12 | 21 (26.9%) | 10 (32.3%) | 1 |
| 12-24 | 31 (39.8%) | 14 (45.1%) | 0.8 (0.4-2.3) |
| ≥24 | 26 (33.3%) | 7 (22.6%) | 2.8 (1.7-5.9) |

*Data is expressed as mean ± standard deviation (Student's t-test), **Data is expressed as number (%) (chi-square test). TL: Trial of labor, ECS: Elective cesarean section, OR: Odds ratio, CI: Confidence interval

Compared to ECS group, TL group had significantly more morbidities in both adjusted and unadjusted OR [1.5 (1.1-4.2) vs 2.4 (1.6-5.6), respectively]. However, all counted maternal

outcomes were more frequently encountered in TL women without reaching significance, as illustrated in Table 4. Also, most neonatal adverse outcomes were non-significantly more

Table 2. Indication of prior CS in TL women

| Indications, n (%) | Successful TL, n=21 | Failed TL, n=57 | p-value |
|--------------------|---------------------|-----------------|---------|
| Non-recurrent | 12 (57.1) | 20 (35.1) | 0.002** |
| Malpresentation | 6 (28.6) | 6 (10.5) | <0.01** |
| Fetal distress | 3 (23.8) | 3 (5.3) | <0.01** |
| Others* | 3 (14.3) | 11 (19.3) | 0.038** |
| Prolonged labor | 7 (33.3) | 17 (29.8) | 0.095 |
| Unknown | 2 (9.5) | 19 (33.3) | <0.01** |

*Others for successful TL included 2 multiple pregnancies and 1 antepartum hemorrhage, while for failed TL included 6 antepartum hemorrhages, 3 multiple pregnancies, and 2 gestational hypertension cases. TL: Trial of labor, CS: Cesarean section

Table 3. Indications of failed TL and ECS women

| Indications, n (%) | Failed TL women, (n=57) | ECS group, (n=31) |
|---------------------------------|-------------------------|-------------------|
| Fetal distress | 29 (50.9) | Nil* |
| Prolonged labor | 18 (31.6) | Nil* |
| Tender uterine scar | 9 (15.8) | Nil* |
| Uterine rupture | 1 (1.7) | Nil* |
| Malpresentation | Nil* | 24 (77.4) |
| Intrauterine growth retardation | Nil* | 3 (9.7) |
| Post term | Nil* | 2 (6.5) |
| Prior myomectomy | Nil* | 1 (3.2) |
| Genital herpes | Nil* | 1 (3.2) |

*Nil: means no reported cases for the specific mentioned indication. TL: Trial of labor, CS: Cesarean section

Table 4. Maternal and neonatal outcomes of labor

| Complications | TL group, (n=78) | ECS group, (n=31) | Unadjusted OR (95% CI) | Adjusted OR (95% CI)* |
|-------------------------------------|------------------|-------------------|------------------------|-----------------------|
| Maternal, n (%) | | | | |
| Total morbidities | 6 (7.7) | 1 (3.2) | 2.4 (1.6-5.6) | 1.5 (1.1-4.2) |
| Puerperal sepsis | 4 (5.1) | 1 (3.2) | 1.3 (0.5-1.8) | 1.7 (0.8-6.4) |
| Postpartum hemorrhage | 3 (3.8) | 1 (3.2) | 1.8 (0.3-7.5) | 3.2 (0.4-12.3) |
| Ruptured uterus | 1 (1.3) | 0 (0.0) | Not applicable | Not applicable |
| Blood transfusion | 1 (1.3) | 0 (0.0) | Not applicable | Not applicable |
| Hysterectomy | 1 (1.3) | 0 (0.0) | Not applicable | Not applicable |
| Neonatal, n (%) | | | | |
| LBW | 25 (32.1) | 9 (29.0%) | 1.2 (0.2-2.4) | 1.4 (0.4-2.1) |
| NICU admission | 17 (21.8) | 7 (22.6) | 0.7 (0.6-1.5) | 0.8 (0.5-2.2) |
| Perinatal asphyxia | 7 (9.0) | 1 (3.2) | 1.6 (0.4-2.6) | 1.9 (1.1-3.3) |
| VLBW | 3 (3.8) | 1 (3.2) | 1.7 (0.5-2.7) | 2.2 (0.6-5.3) |
| Stillbirth and early neonatal death | 1 (1.3) | 0 (0.0) | Not applicable | Not applicable |

*Odds ratios have been adjusted for maternal and gestational age, regular antenatal care visits, period of inter-delivery, and indication of prior surgical delivery (CS). TL: Trial of labor, ECS: Elective cesarean section, OR: Odds ratio, CI: Confidence interval, LBW: Low birth weight, NICU: Neonatal intensive care unit, VLBW: Very low birth weight

common in the TL group compare to the ECS group, with the exception of NICU admission, which was slightly more frequent in the ECS group (Table 4).

Discussion

Adolescent pregnancy is associated with well-known adverse maternal and perinatal complications, which result in increased pressure on health services throughout the world with relatively more burden in resource-limited health systems (12).

On the other hand, TL is also associated with well-known related complications that affect the pregnant mother and her newborn, which again are relatively more problematic when combined with restricted infrastructures of health settings (13). The rate of CS in our adolescent study sample was very high (80.7%) and is much higher than local and international figures (8,14). This may be in part due to the tertiary referrals received in our center, including risky adolescent obstetric cases and repeated requests of ECS in parallel with the beliefs of our population who prefer CS over TL to avoid labor pain (8,15).

Our rate of TL success (19.3%) is apparently less than that reported previously from Turkey (83%) although health services are better resourced in the latter country (6).

In the present study, adolescents who had TL tended to be slightly younger, having regular ANC, and were unemployed. This could be because these women at a younger age may have had less financial security, thus providing less power to select ECS and discuss personal preferences with the obstetrician (16). TL had been shown to be significantly more successful in non-recurrent indication for prior CS compared to recurrent causes such as failure of progress, while unknown indications have a

significant negative effect on TL (7,17). This highlights the need to carefully examine the medical records of women presenting with adolescent pregnancy.

The total morbidities in TL women were significantly more common than in the ECS group, although being attached to the hospital guidelines avoiding the use of oxytocic agents to induce labor in TL women. It was hypothesized that many women with prior single CS scar visiting tertiary centers for labor present late after failed TL, and this would increase the risk of obstetric complications when those women try to avoid another CS, especially in the adolescent age group or due to delay in seeking medical help which is linked directly to poor availability of transportation and the background culture of the community in rural and peripheral areas where home-based labor may be the choice rather than going to the hospital unless complications occur. This community may opt for labor outside appropriate health settings and even may encourage the use of non-conventional medications given by non-health professionals. A significant factor during the study period was the travel restriction and fear of infection associated with the COVID-19 pandemic, which occurred during the study period (18-20).

Perinatal asphyxia in neonates was significantly associated with TL compared to ECS. Indeed, most of asphyxiated cases belonged to women who had a failed TL followed by emergency CS, or those women who had started labor outside our hospital and presented late (21-23).

Although LBW was more common in TL compared to ECS women, this was not significantly different and was high in both groups, as birth weight is commonly affected in adolescent pregnancy (8,16).

Study Limitations

A strength of the present study was the prospective monitoring of TL and ECS outcomes in adolescent pregnant women. However, there are some limitations, including a single center study design. Even though the center was the largest tertiary center in Iraq, health care resources were still restricted. Nevertheless, we have no justified reasons to think that other centers in the country have different circumstances which would contradict the results presented. Another limitation is that we did not follow up involved women after discharge to monitor possible long-term adverse outcomes. Although we tried our best to adjust our results, residual factors that we could not measure might have a confounding effect. Moreover, the study was performed in the best tertiary center in the capital, Baghdad. However, the results will need to be supported by larger multi-centric prospective studies.

Conclusion

Significant higher rates of maternal morbidities and perinatal asphyxia were associated with TL compared to ECS in

adolescent pregnant women with prior single CS in this study, conducted in Baghdad city during the COVID-19 pandemic.

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Ethics Committee Approval: *The University of Baghdad, College of Medicine, and Al-Kindy College of Medicine approved the study (approval number: 173, date: 11.02.2019).*

Informed Consent: *Helsinki Declaration guidelines were applied, and an instructed consent was gathered from all participants.*

Peer-review: *Externally peer-reviewed.*

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