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Original Research Article

Childbirth patterns after previous caesarean birth in sub-Saharan Africa: a retrospective analytical study in two referral hospitals in a semi-urban setting in Cameroon

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ABSTRACT

Background: Rising rates of caesarean section (CS) predispose to uterine rupture (UR) during subsequent childbirths. Childbirth after previous CS has poorly been studied in rural Africa. Objective was to describe and analyse the patterns of childbirths after previous CS.

Methods: A retrospective analytical study of facility-based deliveries after previous caesarean birth from January 1, 2019 to April 30, 2021 in Bafoussam, Cameroon. We included 416 files of women with previous CS for term singleton pregnancies. Statistics were computed with SPSS®.

Results: Mean age and mean parity were 29.9±5.6 years and 3.2±1.4 respectively. Almost half of participants [199 (47.8%)] had had a previous vaginal birth. Antenatal care (ANC) providers were nurses/midwives and general practitioners for 232 (55.8%) and 77 (18.5%) women respectively. The route of delivery wasn't chosen during ANC for 312 (75.0%) women and 99 (23.8%) of participants were referred during labour. Elective repeat CS was done for 92 (22.1%) women and 324 (77.9%) underwent trial of labour after CS (TOLAC) of whom 131 (40.4%) gave birth by vaginal route. Onset of labour was spontaneous in 304 (93.8%) cases. UR complicated 13 (4.0%) cases of TOLAC. Previous vaginal birth predicted successful TOLAC and referred parturients had higher risk of UR. There were 28 (8.6%) perinatal deaths and 1 (0.3%) maternal death.

Conclusions: In our semi urban setting, deliveries after previous caesarean births are unplanned. The success rate of TOLAC is low with a high rate of complications. There is need to improve quality of ANC, birth care and post-natal care for women with previous CS.

Keywords: Caesarean, Childbirth, TOLAC, Uterus scar, Uterine rupture, VBAC

INTRODUCTION

The global and alarming rise in caesarean section (CS) rates (21.1% worldwide; ranging from 4.1% in Africa to 44.3% in Latin America and Caribbean region) mechanically increases the prevalence of pregnancies in women with scarred uteri.¹ Conversely, previous caesarean section (CS) is globally the first contributor to CS rates with a share of 24.5%.² This vicious cycle can be

addressed by ensuring the highest safe rate of vaginal births after caesarean section (VBAC). Decision on the route of delivery in women with previous CS has changed during the last century. Since the first report of vaginal births after previous CS in 1923, the paradigm has shifted from systematic CS to possible trial of labour after caesarean section (TOLAC).^{3,4} The famous Cragin's dictum "once a caesarean, always a caesarean" was in force in a time where caesarean section was always

classical (upper uterine segment hysterotomy).⁴ Nowadays, lower uterine segment caesarean section (LUSCS) is the rule. Several scientific and professional bodies have been confronted with that high incidence of deliveries on scarred uteri and have issued specific guidelines for clinical practice.⁴⁻⁹ The common goal of these guidelines is to avoid, whenever possible, repeat caesarean section and the dreaded uterine rupture while ensuring good maternal and foetal outcomes for women undergoing TOLAC. Moreover, promoting VBAC will help curbing the current epidemic of CS that is linked to much more materno-foetal complications in low and middle-income countries than in high income countries.^{10,11}

In Cameroon (central Africa) the prevalence of childbirth on scarred uteri in tertiary hospitals in the political capital (Yaounde) ranges from 8.0% to 13.7%.¹²⁻¹⁸ Countrywide health facilities are insufficiently equipped for comprehensive emergency obstetrical care which is paramount for high risk deliveries like those in women with scarred uteri. One illustration is the fact that almost half (43.3%) of uterine ruptures in Douala (country's economic capital) and 30.0% in Yaounde occurred in women with scarred uteri.^{17,18} The few data available on TOLAC are limited to national referral health facilities, leaving regional, district and sub-district levels uninvestigated.¹⁹

The aim of this study was to describe and analyse deliveries after previous caesarean childbirth in semi urban setting at the regional referral hospitals in West Cameroon.

METHODS

Study design and participants

This was a retrospective analytical study covered the period ranging from January 1, 2019 to April 30, 2020. Ethical clearance was obtained from the institutional ethical board of the Higher Institute of Health Sciences of the Université des Montagnes in Bangangte- Cameroon.

Inclusion criteria

We included all the files of women with uterine scar from previous CS who gave birth after 37 completed weeks of singleton pregnancy either at the Bafoussam Regional Hospital (BRH) or at the Mbouo Evangelic Hospital (MEH).

Exclusion criteria

Incomplete files were excluded.

Sample size

The minimal sample size of 113 cases was obtained with the Cochrane's formula using 8% as the prevalence of deliveries on scarred uteri in Yaounde- Cameroon.¹⁶

Study setting

This study was conducted in two referral hospitals in Bafoussam the chief town of the West Region of Cameroon: the Bafoussam Regional Hospital (BRH) and the Mbouo Evangelic Hospital (MEH). The BRH is a tertiary 300-bed capacity hospital that serves as the top state-owned reference health facility for the 20 health districts of the Region (roughly 2,250,000 inhabitants).²⁰ The MEH is a 125-bed capacity faith-based hospital that serves as one of the reference health facilities in Bafoussam. The BRH and the MEH are fully equipped to carry out (emergency and elective) CS. The BRH has a blood bank working permanently opened. The MEH doesn't have a blood bank and blood is directly collected from testes and compatible donors when transfusion is needed. In both hospitals, obstetricians, midwives and obstetric care providers are available round the clock to ensure basic obstetric care.

Collected data

Three categories of data were retrieved from patients' files: socio-demographical parameters (maternal age, marital status, occupation and level of education), clinical parameters [comorbidity, gestity, parity, number of previous CS, time laps between the latest uterine scar and the index delivery, route of the latest delivery, availability of post-op notes of the latest CS, surgical site infection following the latest CS post-natal care, number of antenatal consultations (ANC) for the index pregnancy, level of health facility in which ANC were done for the index pregnancy, qualification of the ANC provider, the mode of delivery chosen during ANC, systematic anaesthetic consultation at the end of the index pregnancy, mode of admission into the maternity for delivery, gestational age at delivery, mode of onset of labour, augmentation of labour, indication of caesarean section], maternofoetal and neonatal complications.

Statistical analysis

Data were entered using the Microsoft Excel 2010 software and imported for analysis in the software Statistical Package for Social Sciences 25.0. For descriptive statistics, quantitative data were presented as means with standard deviation and qualitative data presented as proportions. Chi²-test was used to compare proportions and means were compared using the student test (replaced by the Wilcoxon-test for non-normal distribution). Association between variables was determined using crude odds ratios with a 95% confidence interval.

All parameters with significant crude odds ratios were adjusted for confounders by logistic regression to obtain adjusted odds ratios with 95% confidence interval. All the tests were bilateral and the threshold for significance was 0.05.

RESULTS

Of the 5080 deliveries registered during the study period 539 (10.6%) were in women with previous caesarean birth. Of the 539 patients' files, 416 met the inclusion criteria.

Baseline and obstetrical characteristics

Baseline and obstetrical characteristics of participants are described in Table 1. Mean age (standard deviation) was 29.9 (5.6) years with extremes of 18 and 50. Mean parity (standard deviation) was 3.2 (1.4) with extremes of 1 and 9. One quarter [112 (26.9%)] of participants had 2 or more previous CS. Of the 416 women, 199 (47.8%) had had at least one vaginal birth and 77 (18.5%) had had a vaginal birth after a caesarean section. At the time of delivery, the latest caesarean scar was less than 18 months old in 96

(23.1%) women. The post-operative report of the previous caesarean section was available for only 145 (34.9%) of cases. Three hundred and eighteen (76.4%) women had had at least ANC during the index pregnancy and nurses/midwives and general practitioners were respectively the providers for 232 (55.8%) and 77 (18.5%) women respectively. TOLACs were not planned in 312 (96.3%) cases. The mode of delivery was not chosen during ANC in 312 (75.0%) cases and 99 (23.8%) of parturients were admitted in labour ward following reference from other health facilities of this region. Childbirth occurred beyond 41 gestational weeks in 54 (13.0%) cases (49 TOLAC and 5 ELRCS). Labour was induced with prostaglandins in 3 cases (0.9%) and 17 (5.2%) women reported consumption of alleged uterotonics from traditional pharmacopoeia prior to admission in hospitals. Labour was augmented in 44 (13.6%) women.

Table 1: Baseline and obstetrical characteristics.

Variables	TOLAC (N=324) n (%)	ELRCS (N=92) n (%)	Total (N=416) n (%)	P value
Age (years)				
<20	4 (1.2)	0 (0.0)	4 (1.0)	0.118
20-30	169 (52.2)	38 (41.3)	207 (49.7)	
30-40	131 (40.4)	50 (54.3)	181 (43.5)	
>40	20 (6.2)	4 (4.3)	24 (5.8)	
Occupation				
Formal sector	93 (28.7)	31 (33.7)	124 (29.8)	0.528
Informal sector	84 (25.9)	25 (27.2)	109 (26.2)	
Jobless (housewife)	147 (45.4)	36 (39.1)	183 (44.0)	
Marital status				
Single or widow	167 (51.5)	35 (38.0)	202 (48.6)	0.022
In couple	157 (48.5)	57 (62.0)	214 (51.4)	
Level of education				
None	2 (0.6)	1 (1.1)	3 (0.7)	0.762
Primary	22 (6.8)	6 (6.5)	28 (6.7)	
Secondary	196 (60.5)	52 (56.5)	248 (59.6)	
Tertiary	104 (32.1)	33 (35.9)	137 (32.9)	
Type of uterine scar				
Caesarean section	324 (100.0)	92 (100.0)	416 (100.0)	1.0
Caesarean section and myomectomy	3 (0.9)	1 (1.1)	4 (1.0)	
Parity				
1	5 (1.5)	0 (0.0)	5 (1.2)	0.667
2-4	260 (80.2)	77 (83.7)	337 (81.0)	
≥5	59 (18.2)	15 (16.3)	74 (17.8)	
Number of uterine scars				
1	273 (84.3)	31 (33.7)	304 (73.1)	<0.001
≥2	51 (15.7)	61 (66.3)	112 (26.9)	
Route of latest childbirth				
Caesarean section	253 (78.1)	86 (93.5)	339 (81.5)	0.001
Vaginal delivery	71 (21.9)	6 (5.5)	77 (18.5)	
Previous vaginal birth				
Yes	163 (50.3)	36 (39.1)	199 (47.8)	0.058
No	161 (49.7)	56 (60.9)	217 (52.2)	
Age of the latest scar				

Continued.

Variables	TOLAC (N=324) n (%)	ELRCS (N=92) n (%)	Total (N=416) n (%)	P value
<18 months	75 (23.1)	21 (22.8)	96 (23.1)	0.948
≥18 months	249 (76.9)	71 (77.2)	320 (76.9)	
Post-operative report (previous caesarean section)				
Available	114 (35.2)	31 (33.7)	145 (34.9)	0.791
Unavailable	210 (64.8)	61 (66.3)	271 (65.1)	
Surgical site infection following previous uterine surgery(ies)				
Yes	10 (3.1)	4 (4.3)	14 (3.4)	0.521
No	314 (96.9)	88 (95.7)	402 (96.6)	
Post-natal care following previous caesarean section(s)				
Yes	95 (29.3)	36 (39.1)	131 (31.5)	0.074
No	229 (70.7)	56 (60.9)	285 (68.5)	
Number of ANC for the index pregnancy				
<4	87 (26.9)	11 (12.0)	98 (23.6)	0.003
≥4	237 (73.1)	81 (88.0)	318 (76.4)	
Appropriateness of the health facility for ANC				
Appropriate (level 1-3 health facilities)	191 (59.0)	88 (95.7)	279 (67.1)	<0.001
Inappropriate (level 4-5 health facilities)	133 (41.0)	4 (4.3)	137 (32.9)	
Qualification of the ANC provider				
Obstetrician-gynaecologist	35 (10.8)	69 (75.0)	104 (25.0)	<0.001
General practitioner	68 (21.0)	9 (9.8)	77 (18.5)	
Midwife/nurse	218 (67.3)	14 (15.2)	232 (55.8)	
Caregiver	3 (0.3)	0 (0.0)	3 (0.7)	
Pelvimetry (clinical) at the end of pregnancy				
Yes	7 (2.2)	2 (2.2)	9 (2.2)	1.0
No	317 (97.8)	90 (97.8)	407 (97.8)	
Route of delivery chosen during ANC				
None	312 (96.3)	0 (0.0)	312 (75.0)	<0.001
Trial of scar	12 (3.7)	/	12 (2.9)	
Elective repeat caesarean section	/	92 (100.0)	92 (22.1)	
Anaesthetist consultation at the end of pregnancy				
Yes	1 (0.3)	88 (95.7)	89 (21.4)	<0.001
No	323 (99.7)	4 (4.3)	327 (78.6)	
Mode of admission for delivery				
Following reference during labour	95 (29.3)	4 (4.3)	99 (23.8)	<0.001
Admitted in first intention	229 (70.7)	88 (95.7)	317 (76.2)	

Mode of deliveries

Figure 1 illustrates the routes of deliveries. Elective repeat caesarean section (ELRCS) was done for 92 (22.12%) women. Trial of labour after caesarean section (TOLAC) was successful in 131 out of 324 cases (40.43%). Of the 51 (15.7%) women with 2 or more previous CS who underwent unplanned TOLAC, 26 (50.9%) gave birth vaginally.

Indications for caesarean sections

Table 2 summarizes the indications of (elective and emergency) repeat caesarean sections. Elective repeat caesarean sections (ELRCSs) were mainly indicated for

two or more CSs [57 (62.0%)] followed by contracted pelvis [15 (16.3%)]. Emergency repeat caesarean sections (EMRCS) were mainly indicated for: cephalo-pelvic disproportion [29 (15.0%)] in labour, acute foetal distress [27 (14.0%)], labour in women with 2 or more previous CS [25 (13.0%)] and macrosomia diagnosed during labour [25 (13.0%)].

Early maternal and perinatal complications

Table 3 summarizes early maternal and perinatal complications. Uterine rupture occurred in 13 (4.0%) cases of TOLAC and the unique maternal death recorded was due to eclampsia in a successful (vaginal birth) TOLAC. Intrapartum foetal death was significantly more frequent

in the TOLAC group than in the ELRCS group (4.9% versus 0.0%; p value: 0.03). Early neonatal respiratory distress was more frequent in the TOLAC group than in

the ELRCS group but the difference was not significant (9.3% versus 4.3%; p value: 0.13).

Table 2: Indications of repeat caesarean sections.

Indications of repeat caesarean sections	n (%)
Elective repeat caesarean sections	92 (100.0)
Macrosomia scarred uterus	6 (5.5)
≥2 uterine scars	57 (62.0)
Transverse lie	5 (5.4)
Maternal request	2 (2.2)
Poor obstetrical history (history of perinatal death)	2 (2.2)
Post-traumatic bony pelvis	2 (2.2)
Short birth-to-birth interval	2 (2.2)
Contracted pelvis / scarred uterus	15 (16.3)
Maternal genital malformation	1 (1.1)
Emergency repeat caesarean sections (failure of TOLAC)	193 (100.0)
≥2 previous CS + labour	25 (13.0)
Acute foetal distress	27 (14.0)
Cephalopelvic disproportion	29 (15.0)
Labour + macrosomia + uterine scar	25 (13.0)
PROM ≥24 hours + uterine scar	14 (7.3)
Dynamic dystocia + uterine scar	16 (8.3)
Signs of uterine pre-rupture	12 (6.2)
Labour + contracted pelvis + uterine scar	9 (4.7)
Hemorrhagic placenta praevia	6 (3.1)
Severe pre-eclampsia + uterine scar	7 (3.6)
Transverse lie + labor + uterine scar	7 (3.6)
Placenta abruptio + uterine scar	4 (2.1)
Age of scar < 18 months + labour	6 (3.1)
Eclampsia + uterine scar	1 (0.5)
Post-term + labor + uterine scar	2 (1.0)
Twin pregnancy + labour + uterine scar	1 (0.5)
Cervical dystocia + uterine scar	1 (0.5)
Labour + classical uterine scar	1 (0.5)

TOLAC; trial of labour after caesarean section; PROM: premature rupture of membranes; CS: caesarean section

Table 3: Early maternal and perinatal complications.

Complications	Overall TOLAC (N=324) n (%)	Successful TOLAC (VBAC) (N=131) n (%)	Failed TOLAC (EMRCS) (N=193) n (%)	ELRCS (N=92) n (%)	Total (N=416) n (%)	P value (TOLAC versus ELRCS)
Maternal complications						
Uterine rupture	13 (4.0)	0 (0.0)	13 (6.7)	NA	13 (3.1)	-
Perineal tear	23 (7.1)	23 (17.6)	NA	NA	23 (5.5)	-
Endometritis	6 (1.9)	2 (1.5)	4 (2.1)	1 (1.1)	7 (1.7)	1.0
Severe anemia	8 (2.5)	0 (0.0)	8 (4.1)	1 (1.1)	9 (2.2)	0.69
Maternal death	1 (0.3)	1 (0.8)	0 (0.0)	0 (0.0)	1 (0.2)	1.0
Perinatal complications						
Respiratory distress	30 (9.3)	9 (6.9)	21 (10.9)	4 (4.3)	34 (8.2)	0.13
Neonatal infection	2 (0.6)	2 (1.5)	0 (0.0)	0 (0.0)	2 (0.5)	1.0
Neonatal asphyxia	6 (1.9)	1 (0.8)	5 (2.6)	0 (0.0)	6 (1.4)	0.35
In utero fetal death	12 (3.7)	2 (1.5)	10 (5.2)	0 (0.0)	12 (2.9)	0.08
Intrapartum death	16 (4.9)	4 (3.1)	12 (6.2)	0 (0.0)	16 (3.8)	0.03

VBAC: Vaginal birth after caesarean section; NA: Not applicable. ELRCS: elective repeat caesarean section; TOLAC; trial of labour after caesarean section; EMRCS: emergency repeat caesarean section

Associated factors of failure of TOLAC and uterine rupture during TOLAC

Table 4 summarizes the correlates of failure of TOLAC and Table 5 shows the correlates of uterine rupture during TOLAC. TOLAC was significantly more likely to succeed in women with previous vaginal birth and in those with a

single uterine scar. TOLAC was significantly more likely to fail in women with two or more previous CS. Neonates from failed TOLAC were significantly more frequently resuscitated [aOR (95%CI): 2.2 (1.0-4.7); p value: 0.049]. We found that only referral from lower-level health facilities was significantly associated with uterine rupture during TOLAC [aOR (95%CI): 11.4 (2.9-44.2); p value <0.001].

Table 4: Variables associated with failure of TOLAC.

Variables	Failed TOLAC (N=193) n (%)	Successful TOLAC (N=131) n (%)	cOR (95%CI)	P value*	aOR (95%CI)	P value**
Maternal age >30 years	74 (38.3)	52 (39.7)	0.9 (0.6-1.4)	0.806	-	-
Uterine scar <18 months	53 (27.5)	22 (16.8)	1.8 (1.0-3.2)	0.025	1.3 (0.7-2.4)	0.354
Puerperal infection of the previous scar	6 (3.1)	4 (3.1)	1.0 (0.2-3.6)	1.0	-	-
Prior vaginal delivery	96 (49.7)	67 (51.1)	0.9 (0.6-1.4)	0.804	-	-
Previous VBAC	20 (10.4)	51 (38.9)	0.1 (0.1-0.3)	<0.001	0.2(0.1-0.3)	<0.001
Parity ≥5	35 (18.1)	24 (18.3)	0.9 (0.5-1.7)	1.0	-	-
Single scarred uterus	147 (76.2)	126 (96.2)	0.2 (0.1-0.3)	<0.001	0.1(0.1-0.4)	<0.001
≥2 uterine scars	46 (23.8)	5 (3.8)	7.8 (3.0-20.4)	<0.001	6.9 (2.6-18.4)	<0.001
<4 ANC	57 (29.5)	30 (22.9)	1.4 (0.8-2.3)	0.186	-	-
Referred during labor	61 (31.6)	34 (26.0)	1.3 (0.8-2.1)	0.273	-	-
GA ≥ 41 weeks	31 (16.1)	18 (13.7)	1.2 (0.6-2.2)	0.567	-	-
Clinical pelvimetry at ANC	5 (2.6)	2 (1.5)	1.75 (0.3-8.9)	0.706	-	-
weight >4000 grams	21 (10.9)	8 (6.1)	1.8 (0.8-4.3)	0.140	-	-
5 th min. Apgar score <7	22 (11.4)	7 (5.3)	2.2 (0.9-5.5)	0.061	-	-
Neonatal resuscitation	31 (16.1)	11 (8.4)	2.0 (1.0 - 4.3)	0.044	2.2 (1.0-4.7)	0.049
Maternal death	0 (0.0)	1 (0.8)	-	0.404	-	-
Fresh still birth	12 (6.2)	4 (3.1)	2.1 (0.6-6.6)	0.197	-	-

VBAC: Vaginal birth after caesarean section; ANC: Antenatal consultation; GA; Gestational age; TOLAC: trial of labour after caesarean section; cOR: crude odds ratio; aOR: adjusted OR. P value*: p value before adjustment; P value**: p value after adjustment; TOLAC: trial of labour after caesarean section

Table 5: Variables associated with uterine rupture during TOLAC.

Variables	Uterine rupture N=13 n (%)	No uterine rupture N=311 n (%)	cOR (95%CI)	P value*	aOR(95%CI)	P value**
Induced labour	0 (0.0)	2 (0.6)	-	1.0	-	-
Use of uterotonics from traditional pharmacopeia	0 (0.0)	8 (2.8)	-	1.0	-	-
Augmented labour with oxytocin	4 (30.8)	39 (12.5)	3.1 (0.9-10.5)	0.078	-	-
Foetal weight > 4000 gm	0 (0.0)	29 (9.3)	-	0.616	-	-
Maternal age >30 years	8 (61.5)	118 (37.9)	2.6 (0.8-8.1)	0.087	-	-
Uterine scar ≤18 months	5 (38.5)	70 (22.5)	2.1 (0.6-6.7)	0.188	-	-
Puerperal infection of the previous scar	1 (7.7)	9 (2.9)	2.7 (0.3-23.8)	0.340	-	-
Previous vaginal delivery	6 (46.2)	157 (50.5)	0.8 (0.2-2.5)	0.785	-	-
Previous VBAC	2 (15.4)	69 (22.2)	0.6 (0.1-2.9)	0.741	-	-
Parity ≥5	2 (15.4)	57 (18.3)	0.8 (0.1-3.7)	1.0	-	-
Single uterine scar	10 (76.9)	263 (84.6)	0.6 (0.1-2.2)	0.439	-	-
≥2 uterine scars	3 (23.1)	48 (15.4)	1.6 (0.4-6.1)	0.439	-	-
<4 ANC	5 (38.5)	82 (26.4)	1.7 (0.5-5.4)	0.346	-	-

Continued.

Variables	Uterine rupture N=13 n (%)	No uterine rupture N=311 n (%)	cOR (95% CI)	P value*	aOR(95% CI)	P value**
Single or widow	3 (23.1)	164 (52.7)	0.3 (0.1-0.9)	0.036	0.2 (0.1-0.8)	0.023
Referred during labour	10 (76.9)	85 (27.3)	8.8 (2.3-32.9)	<0.001	11.4 (2.9-44.2)	<0.001
Pelvimetry during ANC	13 (100.0)	304 (97.7)	-	1.0	-	-

VBAC: Vaginal birth after caesarean section; ANC: Antenatal consultation; cOR: crude Odds Ratio; aOR: adjusted OR. P value*: p value before adjustment; P value**: p value after adjustments

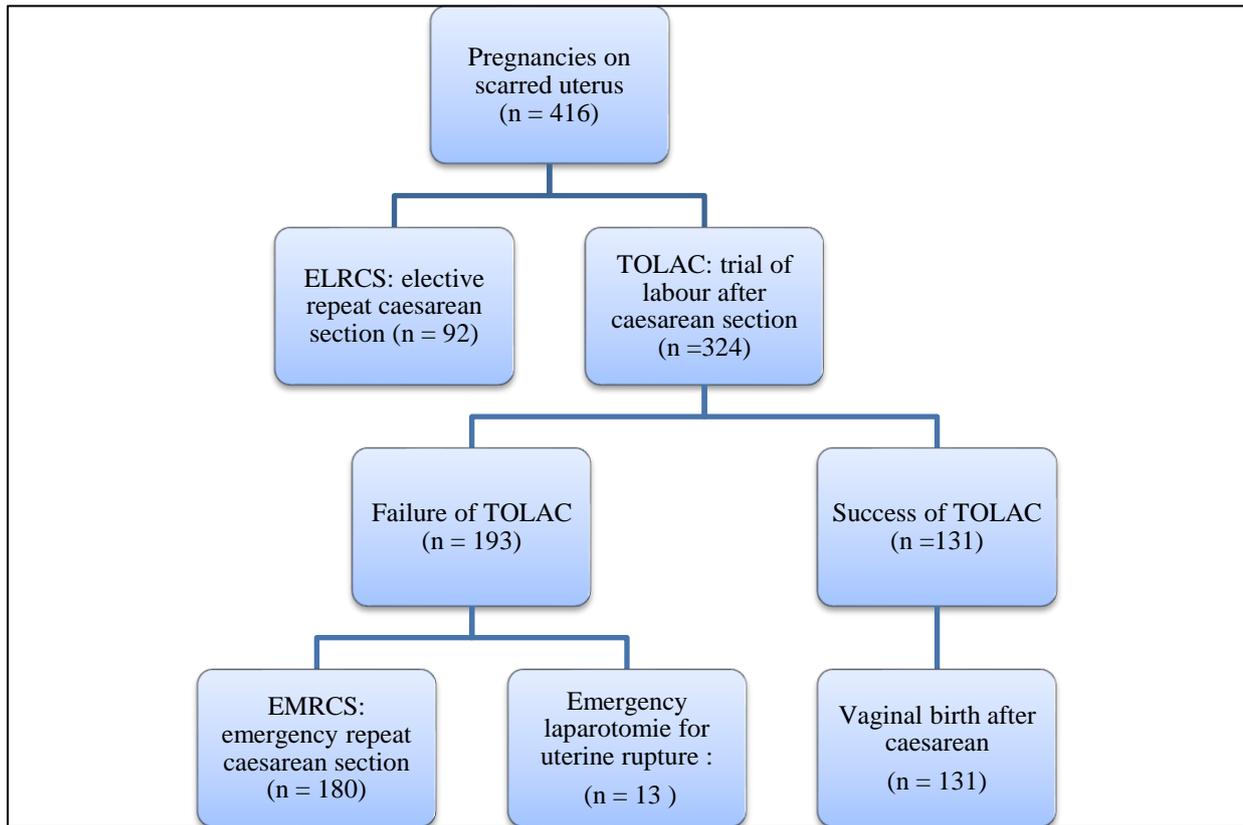


Figure 1: Childbirths after previous caesarean birth.

DISCUSSION

The prevalence of deliveries on scarred uteri in our series (10.6%) was much higher than the previous study in Limbe- Southwest Cameroon (4.4%) but similar to figures reported in several urban sub-Saharan African cities: 8.0-13.7% in Yaounde (Cameroon), 9.6% in Dakar (Senegal), 11.6% in Accra (Ghana), 15.1% in Enugu (Nigeria).^{15,16,19,21-23} In Cameroon, Bafoussam is indeed the third city behind the economic and political capitals and may therefore share common characteristics with the above-mentioned African capital cities, while Limbe belong to a lower category of towns.

Preparing pregnant women with scarred uteri for childbirth is pivotal for materno-foetal outcomes; this is particularly true in resource-challenged settings where the framework

for emergency obstetrical care is structurally deficient.⁴⁻⁹ Details of the discussion on the timing, the mode and the setting of delivery on scarred uterus should be documented in patients’ antenatal consultations (ANC) notes.⁴ We found that 75.0% of women were not prepare for birth despite the fact that 76.4% had at least 4 ANC’s This could be explained by the low qualification of care providers (only 25.0% were followed up by obstetricians-gynaecologists) and the inappropriateness of health facilities in which they received antenatal care (32.9%). Similarly, postnatal care after the immediate past childbirth was not effective in 68.5% of women explaining why post-operative report of the previous CS was unavailable and why at the time of delivery the scar was less than 18 months old in 23.1% of cases. This is in line with the low prevalence (13.5%) of modern contraception in Cameroon.

Most scientific bodies have agreed on the minimum requirements for the setting in which TOLAC should be attempted.⁴⁻⁹ These include inter alia: permanent availability infrastructural and human resources for emergency CS (obstetric, anaesthetic, paediatric and operative-room staff), continuous foetal monitoring and advanced neonatal resuscitation. We found that 23.8% of women began TOLAC in inadequate health facilities and were referred for better care. The World Health Organisation (WHO) regional office for Africa has identified some causes (poverty, lack of information, distance, inadequate services and cultural practices) of inadequate preparation for childbirth that should be properly addressed as a study in the Centre Region of Cameroon already reported.²⁴⁻²⁶

It is a routine practice for obstetricians and other obstetric care providers in Cameroon to avoid labour in women with two or more previous CS. In this series that was the indication for 62.0% of elective repeat caesarean sections (ELRCS) and for 13.0% of emergency repeat caesarean sections (EMRCS). They adopted those unwritten national guidelines (expert agreement) on the ground that throughout the country hospital settings are not suitable with the increased risk of uterine rupture in such cases.⁴⁻⁹ The same cautiousness explains why labour was induced in only 3 (0.9%) cases out of the 54 (13.0%) that extended beyond 41 weeks.

VBAC rate in TOLAC group in our series (40.4%) was much lower than those commonly reported worldwide (ranging from 50% to 85%).^{4-9,14,15,21-23,27} This can be explained by the fact that, most of cases were unplanned TOLAC. Indeed, several indications of EMRCS for failed TOLAC reveal on the one hand that several women were not eligible for TOLAC and on the other hand that decisions for emergency CS could have been avoided or postponed in more equipped settings thus giving more chance for VBAC (successful TOLAC). A “revised” appraisal after excluding the previous cases (≥ 2 previous CS, macrosomia, contracted pelvis, placenta previa, transverse lie, too recent scar (<18 months), classical uterine scar, multiple pregnancy) and assuming a VBAC rate of 33.3% among the latter cases (premature rupture of membranes >24 hours, post-term, dynamic dystocia, severe pre-eclampsia) would have given a VBAC (successful TOLAC) rate of 59.0%. Articles reporting high rates of successful VBAC are derived from cohorts of adequately selected women who were monitored by experts in appropriate settings while our series appraised a real life situation in a resource-poor context. Indeed, 29.3% of women who underwent TOLAC in our series were referred during labour; Mve et al and Koulimaya-Gombet et al reported respectively 25.0% and 54.5% in Yaounde and Dakar.^{16,21} It is therefore evident that our participants did not receive straightaway the best obstetrical expertise available in the region. This has been depicted by several authors in sub-Saharan Africa calling for more effective policy toward focused antenatal care.^{21-23,28}

The rate of uterine rupture (4.0%) in the TOLAC group was higher than those commonly reported both in Cameroon and elsewhere in sub-Saharan Africa (ranging from 0% to 2.4%).^{16,19,21,23,24,29,30} Maternal mortality rate in our TOLAC group (0.3%) was also higher (slightly) than commonly reported figures, indicating less effective emergency obstetrical care.^{16,21,23,28} Indeed, being referred was the single factor significantly associated with uterine rupture in our series increasing the odds by 11 folds. It is therefore paramount to ensure that women undergo TOLAC directly in reference hospitals.

Perinatal complications in the TOLAC group were higher than in ELRCS group but the difference was significant only for intrapartum foetal death. Previous studies in sub-Saharan Africa reported that perinatal outcomes were on the one hand significantly poorer in TOLAC than in ELRCS and on the other hand significantly poorer in successful TOLAC (VBAC) than in failed TOLAC [emergency caesarean section (EMRCS)].^{14,16,19,21-23,28} In developed countries too, perinatal outcomes in TOLAC are significantly poorer than in ELRCS.^{4,5}

As it is admitted in the literature, our study found that previous vaginal birth significantly predicted success of TOLAC and TOLAC was significantly more likely to fail among women having two or more CS scars while the unicity of the scar was associated with higher odds of success.^{4-9,30,31}

This study has the advantage of being the first (to the best of authors' knowledge) to explore TOLAC in West region of Cameroon. It also appraises and assesses routine practice on a sensitive issue in maternal care. The bi-centric nature (two largest hospitals in region's capital) of the study and the (relatively) large sample size reinforces the representativity of the results. Beyond showing that hospital care of pregnant women with scarred uterus is inadequate in West Cameroon, this study has identified weaknesses for which action is needed. Specific public health interventions should be drafted, implemented and evaluated to improve pregnancy outcomes in women with scarred uteri in Cameroon. Nevertheless, given that this study has been carried out in two semi urban hospitals, results may not be accurately extrapolated to the whole region which is mainly rural. Moreover, this study suffered from flaws of retrospective studies namely missing data and lost files.

CONCLUSION

In our semi urban setting, deliveries after previous caesarean birth are common and unplanned. The success rate of TOLAC is low while the rate of complications is high. This study showed that hospital care of pregnant women with scarred uterus is inadequate in this setting. Therefore, the quality of ANC, birth care and post-natal care in women with previous caesarean section should be improved. This would require inter alia, training of health care providers, implementing practice guidelines and

sensitising community on the risk of complications associated with delivery on scarred uteri and improving access to health care for population in this setting.

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