

Associated Factors with Vaginal Delivery on a Uni- or Bi-Scar Uterus in a Low-Resource Setting

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Abstract

Introduction: Delivery in a scar uterus is one of the most debated topics in obstetrics. The objective was to determine the uterine test and the maternal-fetal outcome in patients with uni- and bi-scarred uterus who received the uterine test at Panzi General Referral Hospital. **Methodology:** This is a cross-sectional study with a prospective collection of patients who delivered on a uni- or bi-scarred uterus at Panzi Hospital, between January 1, 2021 and August 1, 2022. **Results:** The average age of the patients was 27.09 years, with an age range of 25 - 34 years, they were mostly married (88.3%), with secondary educational level (60.4%). Pauciparous women, with a history of previous caesarean delivery once, represented respectively 52.2%; 7.2% of parturients with an intergenital space equal to 18 months. 63.9% were overweight, 58.6% had undergone more than three ANC sessions. We noted statistically significant associations between modes of admission, water sac, type of membranes rupture, uterine height and success of uterine test ($p < 0.05$). We did not find significant associations between parturient age, gestational age, intergestational interval, pregnancy term, surgical history, number of ANC performed, number of previous caesarean sections, number of newborns. We did not record any cases of maternal death but one case of perinatal death with 0.9% in this study. **Conclusion:** A good selection of patients with uni- or bi-scarred uterus would allow the reduction of the fetomaternal morbidity during the uterine test.

Keywords

Uterine Test, Prognosis, Uni- and Bi-Scarred Uterus, Panzi Hospital

1. Introduction

The rate of cesarean section has been increasing in recent years in most developed and developing countries. This trend has led to an increasing number of women with scarred uterine [1].

The cesarean section rate doubled in France and quadrupled in the United States between 1970 and 2010. Across the Atlantic, the frequency of cesarean section cases increased significantly from 20.7% to 32.8% between 1996 and 2007 [2] [3].

The history of previous cesarean sections is also recognized as a significant contributor to the increase in the cesarean section rate [4] [5]. Currently, nearly 10% of women who come to give birth have a scarred uterus.

Complications during pregnancy remain exceptional and are represented by placental implantation anomalies (Placenta previa, accreta, percreta), scar pregnancy, uterine scar dehiscence and uterine rupture [6]. Fetal and maternal morbidity is high regardless of the route of delivery in scar uterus delivery [7].

Current studies agree on the benefits of a trial of vaginal delivery in a scarred uterus in terms of reduced maternal-infant morbidity and health care savings [8].

Despite the progress made in obstetrical techniques and anesthesia to offer better maternal-fetal safety during cesarean section, maternal complication rates remain high, sometimes putting at risk the vital prognosis and obstetrical outcome of patients [9].

The improved direction of labor and the generalization of segmental cesarean sections have made vaginal delivery possible in patients who were previously caesarean section [10].

The objective: was to determine the uterine test and the maternal-fetal outcome in patients with uni- and bi-scarred uterus who received the uterine test at Panzi General Referral Hospital.

2. Methods

Type of study and Study setting: This was a cross-sectional study with an analytical focus on pregnant women with uni- or bi-scarred uterus after vaginal delivery. It covered the period from January 2021 to October 2022 and was conducted at Panzi General Referral Hospital in the city of Bukavu, South Kivu province in the Democratic Republic of the Congo. A referral facility in Ibanda health zone covering a population of 511,396 inhabitants and receiving patients referred from 28 hospitals and 24 health centers. It is a university hospital with an average of 3000 deliveries per year and a caesarean section rate of 32%.

When we say University Hospital, we already understand that specialists, general practitioners and midwives are trained there.

Criteria include: all parturients with a single segmental or bi-scarred uterine scar with or without proven spontaneous induction of labor (active phase), a softened, axial, and 50% effaced cervix, a single fetus in apex presentation (fetal accommodation), a uterine height < 34 cm (exclude macrosomia on ultrasound

≤ 3500 grs), a scar thickness > 35 mm on a clinically or radiologically normal pelvis.

After prior screening and follow-up during prenatal consultations, these patients are usually oriented on the delivery route and or possible uterine test.

We used a non-exhaustive sample of 111 pregnant women with one or two uterine scars who delivered at Panzi Hospital during the study period.

Several variables were considered for the realization of this study, the socio-demographic aspect including the age of the pregnant woman, the level of education (none, primary, secondary, university), the marital status (widow, married, single), the profession (housewife, civil servant, shopkeeper, student).

Obstetrical history considered were gravida (paucigest, multigeste), para (primiparous, pauciparous, multiparous), number of ANC (≤ 1 , 2, ≥ 3), number of previous cesarean sections (1, 2), number of previous vaginal deliveries, previous indications), parameters related to the course of delivery including (gestational age, mode of admission (referral, single arrival), factors of success of uterine test in patients with uni- and bi-cicatrical uterus (age group, gestational age, para, intergenital interval, age of pregnancy, surgical history, delivery mode, ANC, number of previous caesarean sections), water pocket (intact, ruptured), type of rupture (none, early, untimely), height of the uterus, size of the uterus, etc, early, untimely), uterine height (< 28 cm, 28 - 33 cm, > 33 cm), cervical dilatation (1 - 3, ≥ 4), Neonatal prognosis associated with successful uterine testing in parturients with uni- and bi-scarred uteri: neonatal sex, birth weight.

The variables of interest

a) **The following independent variables were selected**

- Socio-demographic variables: age, origin, occupation, marital status, grade;
- Clinical variables: BMI (body mass index), parity, gestational age, number of antenatal visits, medical, surgical, family and other history;
- Labour variables: status of membranes, HU, Manning score, ultrasound, etc.
- Neonatal variables: newborn weight, APGAR;
- Maternal prognosis variables: postpartum haemorrhage, rupture or depletion of old scar, etc.

b) **Dependent variable:** route of delivery: vaginal delivery. The vaginal delivery is the criterion for success in the uterine test.

2.1. Data Collection Tools

Upon arrival in the delivery room, eligible women gave their consent to participate in the study. Immediately, the study parameters were collected as the patient progressed through labor and delivery.

Thanks to a pre-established questionnaire with which we used to collect the patient's information; we used the patient's obstetrical records, the delivery register, the partogram and the follow-up records of the mother's newborns as data supports. Data collection was carried out by the midwives, trainee doctors and

doctors in our department.

2.2. Data Management and Analysis

The collected data were coded using Microsoft Excel 2013 and analyzed by SPSS version 23 software. Categorical variables were summarized as a frequency table. Quantitative variables were summarized by the mean and their deviation standards or the median and its deviation domains depending on whether the distribution was symmetric or not. For the comparison of proportions, we used Pearson's chi-square test and the exact test of Fisher when the application conditions were met. The test was significant when the p-value was less than 0.05.

2.3. Ethical Considerations

Data collection was done in strict accordance with the principles of confidentiality and discretion. All participants had freely consented to participate in the study. This study was authorized by the National Health Ethics Committee and registered under number: CNES 001/DPSK/191PP/2022.

3. Results

Table 1 shows the socio-demographic characteristics of the parturients in our study.

We note that the average age of the parturients was 27.09 (± 5.02) years and more than half of them were in the age range of 25 - 34 years. Regarding religion, we noted that fifty-two percent of parturients were Protestant, followed by twenty-six percent Catholic. We also noted that sixty percent of parturients were from Ibanda commune. The majority (88.3%) of parturients were married, 78.4% were housewives and 10.8% were civil servants. Sixty percent of parturients had a secondary education and 15.3% were university graduates.

Regarding the obstetrical history of parturients presented in **Table 2**, pauciparous represented more than half (52.2%), 54.1% had a living child and 10% had already lost children (deceased). We also noted that 7.2% with an intergenital space equal to 18 months, 63.9% were overweight and 10.8% were underweight. Seven percent of the parturients had performed only one ANC session during the pregnancy and 58.6% had performed more than three ANC sessions.

We found that the median age of pregnancy was 38 (34 - 41) weeks of amenorrhea and in the majority 74.8% of the cases, the pregnancy age was between 37 - 40 weeks of amenorrhea. The median uterine height of the parturients was 31 (22 - 39) cm and most of them had a uterine height from 28 - 33 cm.

Regarding **Table 3**, we found statistically significant associations between modes of admission, water sac, type of rupture of membranes, uterine height and success of uterine test ($p < 0.05$).

We did not find significant associations between parturient age, gravida, para, intergestational interval, pregnancy age, surgical history, number of ANC

Table 1. Socio-demographic characteristics of parturients.

Parameters	N = 111 (%)	Mean (\pm SD)
Age range (years)		
≤ 24	37 (33.4)	27.09 (± 5.02) years
25 - 34	62 (55.8)	
35 - 44	12 (10.8)	
Religion		
Protestant	58 (52.3)	
Catholic	29 (26.1)	
Brahamamist	9 (8.1)	
Secular	8 (7.2)	
Muslim	5 (4.5)	
Awakening church	2 (1.8)	
Place of origin		
Ibanda	67 (60.4)	
Kadutu	16 (14.4)	
Out of town	16 (14.4)	
Bagira	8 (7.2)	
Out of province	4 (3.6)	
Marital status		
Married	98 (88.3)	
Single	11 (9.9)	
Widow	2 (1.8)	
Parturients' occupation		
Housewife	87 (78.4)	
Civil servant	12 (10.8)	
Trader	8 (7.2)	
Pupil/Student	4 (3.6)	
Education level		
Illiterate	16 (14.4)	
Primary	11 (9.9)	
Secondary	67 (60.4)	
University	17 (15.3)	
Spouse' occupation		
Trader	37 (33.3)	
Civil servant	32 (28.8)	
Household	37 (33.3)	
Teacher	5 (4.5)	

SD: Standard de déviation, Min: minimum, Max: maximum.

Table 2. Obstetrical history of parturients.

Parameters	N = 111 (%)	Median (min-max)
Gravida		
Paucigest	56 (50.5)	
Multigest	55 (49.5)	2 (2 - 7)
Para		
Grandmultiparous	4 (3.6)	
Pauciparous	58 (52.2)	2 (1 - 9)
Multiparous	49 (44.2)	
Living children		
Zero	2 (1.8)	
One	60 (54.1)	1 (0 - 9)
Two or more	49 (44.1)	
Number of children who died		
Zero	98 (88.2)	
one	11 (10.0)	0 (0 - 3)
Two or more	2 (1.8)	
Number of abortions		
Zero	94 (84.6)	
one	11 (10.0)	0 (0 - 5)
Two or more	6 (5.4)	
Intergenic interval (months)		
=18	8 (7.2)	
≥18	103 (92.8)	28 (22 - 120)
BMI		
<19.5	19 (10.8)	
19.5 - 25	28 (25.3)	28 (16 - 35)
≤26	71 (63.9)	
Number of ANC's		
≤1	9 (8.1)	
2	37 (33.3)	3 (0 - 6)
≥3	65 (58.6)	
Pregnancy age (in WA)		
< 37	21 (18.9)	38 (34 - 41)
37 - 40	83 (74.8)	
>40	7 (6.3)	
Uterine height (in cm)		
<28	6 (5.4)	

Continued

28 - 33	86 (77.4)	31 (22 - 39)
≥33	19 (17.2)	
Cervical dilatation		
1 - 3	72 (64.8)	3.07 (±2.36)
≥4	39 (35.2)	
FH		
<120	7 (6.3)	
120 - 160	93 (83.7)	144 (98 - 188)
>160	11 (9.9)	

UH: uterine height; FH: fetal heart sounds; WA: weeks of amenorrhea; ANC: prenatal consultation.

Table 3. Factors for successful uterine testing in parturients with uni and bi-scarred uterine.

Paramètres	Uterine testing		p-value
	Successful (n = 71)	Failure (n = 40)	
Age range (years)			0.960
≤24	24 (64.8)	13 (35.2)	
25 - 34	39 (62.9)	23 (37.1)	
35 - 44	8 (66.6)	4 (33.4)	
Gravida			0.746
Paucigest	35 (62.5)	21 (37.5)	
Multigest	36 (65.4)	19 (34.5)	
Para			0.843
Pauciparous	36 (62.1)	23 (37.9)	
Multiparous	32 (65.3)	17 (34.7)	
Grand multiparous	3 (75.0)	1 (25.0)	
Intergenic interval (months)			0.928
=18	5 (62.5)	3 (37.5)	
≥18	66 (64.1)	37 (35.9)	
Pregnancy age (in WA)			0.901
<37	13 (61.9)	8 (38.1)	
37 - 40	53 (63.8)	30 (36.2)	
≥40	5 (71.4)	2 (28.6)	
History of surgery			0.728
No	68 (63.6)	39 (36.4)	

Continued

Ectopic pregnancy	1 (100.0)	0 (0.0)	
Cystectomy	1 (100.0)	0 (0.0)	
Appendectomy	1 (50.0)	1 (50.0)	
Mode of admission			0.188
Referred	3 (100.0)	0 (0.0)	
Self-referral	68 (63.0)	40 (37.0)	
Prenatalconsultation			0.268
No	8 (80.0)	2 (20.0)	
Yes	63 (62.4)	38 (37.6)	
Number of abortions			0.956
One	44 (63.8)	25 (36.2)	
Two	27 (64.3)	15 (35.7)	
Water sac			0.002
Intact	66 (70.2)	28 (29.8)	
Broken	5 (29.4)	12 (70.6)	
Appearance of amniotic fluid			<0.001
Opalescent	66 (70.2)	28 (29.8)	
Méconial	19 (34.5)	36 (65.5)	
Uterine height (in cm)			0.005
<28	4 (66.6)	2 (33.4)	
28 - 33	61 (70.9)	25 (29.1)	
≤34	6 (31.5)	13 (68.5)	
Cervical dilatation			0.223
1 - 3	49 (68.1)	23 (31.9)	
≥4	22 (56.4)	17 (43.6)	

performed, number of previous cesarean sections, cervical dilation and success of uterine test ($p > 0.05$).

Regarding **Table 4**, factors for successful uterine testing in parturients with uni and bicatricial uteri were an intact water sac with a 5-fold chance (AOR = 5.65; 95% CI: 1.82 - 17.56; $p < 0.001$), opalescent appearance of amniotic fluid (AOR = 5.64; 95% CI: 1.81 - 17.55; $p = 0.002$), normal uterine height (AOR = 6.10; 95% CI: 2.55 - 14.53; $p < 0.001$), Successful uterine testing was associated with good APGAR and no resuscitation of the newborn with a 5-fold chance (AOR = 4.92; 95% CI: 1.01 - 26.69; $p = 0.044$).

We did not find statistically significant associations between cervical dilation and test success ($p > 0.05$). Regarding the neonatal prognosis associated with the success of the uterine test in parturients with uni- and bi-scarred uterus in **Table 5**, 52.3% of newborns were female versus 47.7% male. Concerning the fetal

Table 4. Logistic regression of factors for successful uterine testing in parturients with uni and bi-scarred uteri.

Parameters	ORa (CI à 95%)	p-value
Number of previous CS		
One	0.97 (0.43 - 2.17)	0.956
Two	1	
Water sac		
Broken	1	
Intact	5.65 (1.82 - 17.56)	<0.001
Type of breakage		
Tempestive	1	
Intempestive	5.65 (1.82 - 17.56)	<0.001
Appearance of amniotic fluid		
Meconial	1	
Opalescent	5.64 (1.81 - 17.55)	0.002
Prognosis of delivery		
Poor	1	
Good	3.63 (1.61 - 8.21)	<0.001
Uterine height (cm)		
Abnormal	1	
Normal	6.10 (2.55 - 14.53)	<0.001
Cervical dilatation		
1 - 3	1.64 (0.73 - 3.67)	0.224
≥4	1	

Table 5. Neonatal prognosis associated with successful uterine testing in parturients with uni- and bi-scar uteri.

Parameters	Uterine test		p-value
	Successful (n = 71)	failure (n = 40)	
Sex of newborns			
Female	40 (69.0)	18 (31.0)	0.251
Male	31 (58.5)	22 (41.5)	
Birth weight (in grams)			
<2500	2 (50.0)	2 (50.0)	
2500 - 3500	68 (66.1)	35 (33.9)	0.205
>3500	1 (25.0)	3 (75.0)	
Neonatal resuscitation			
No	69 (66.3)	35 (33.7)	0.044
Yes	2 (28.6)	5 (71.4)	

Continued

Apgar at 5th minute			
<7	2 (28.5)	5 (71.5)	
≥7	69 (66.3)	35 (33.7)	0.044

prognosis, we noted neonatal asphyxia in 6.3% of the newborns and they were resuscitated in neonatology, 3.6% had a low birth weight, we found statistically significant associations between the uterine test, neonatal asphyxia and the notion of resuscitation among the newborns ($p < 0.05$).

In **Table 6**, among the 40 cases of failed uterine test, we recorded 11 cases (27.5%) of adhesions, 9 cases (22.5%) of delivery hemorrhage, for the 71 cases of successful uterine test, we note (8.5%) of placental retention, (2.8%) of perineal tear and (1.4%) of cervical tear. During this study period we did not record any cases of maternal death but one case of perinatal death with 0.9% in this study.

4. Discussion

Our study was based on determining the factors associated with the delivery of the uterine test and the maternal-perinatal prognosis afterwards in women who delivered on uni- and bi-scarred uterus at Panzi Hospital. By evaluating the parameters that are not part of the protocol on the management of scar uteri as a whole, we were able to distinguish the management principle for this problem. We registered a population of active reproductive age with a low level of education and no profession. The poor women represented more cases, came by themselves and consulted in latency phase, intact water bag, type of untimely rupture of membranes, uterine height and success of uterine test ($p < 0.05$). With a significant value in the success of the uterine test, the uni-scarred uteri were the most represented.

Age of patients: In our study, the majority of patients were between 25 and 34 years old (55.8%) without significant value compared to Landon *et al.* [9] [10]. who in his study age did not have significant values in the success of the uterine test.

Occupation of patients: 78.4% of our patients were without occupation, this is explained by the lack of financial accessibility which has become a major problem contrary to the study of Koh, V [11] *et al.* recently showed that salaried civil servants and shopkeepers accounted for 92% of pregnant women.

Marital status: The majority of our patients (88.3%) were married, which could be explained by Christianity in the Congo, as the religion is against divorce.

ANC session: 58.6% of our patients had undergone more than three ANC sessions, which is recommended by the national protocol [12]. Because the focused prenatal consultation allows for early detection and treatment of maternal-fetal morbidities, health promotion, during which complications associated with a scarred uterus could be discussed, and the delivery plan, which indicates

Table 6. Complications in parturients who received the uterine test.

Parameters	N = (%)
Intra-operative complications	
Adhesions (n = 40)	
No	29 (72.5)
Yes	11 (27.5)
Delivery hemorrhage	
No	31 (77.5)
Yes	9 (22.5)
Complications for successful completion of the test (n = 71)	
Cervical tear	1 (1.4)
Perineal tear	2 (2.8)
Retention	6 (8.5)
Without any Complications	62 (87.3)

the most appropriate place for delivery, the competent provider who should take charge of delivery in a scarred uterus, etc.

In our series, four elements favored the success of the uterine test: the mode of admission, the state of the water sac, the type of rupture of the membranes and the uterine height.

The mode of admission: 63% of our patients came by themselves and this had allowed us not to have many complications of our patients during the uterine test.

Foumane P *et al.* [12]. Who had found that the risk of indicating a caesarean section was multiplied by 27.4 by the reference of the patients.

Status of the water sac: Most of our patients were admitted with intact membranes at 70.2% (OR = 5.65 [1.82 - 17.56]) and with untimely rupture of membranes as a type. This corroborates with the study of Wa Momat *et al.* [13]. Who in their series, ruptured water sac was statistically associated with uterine test failure (OR = 3.95 [2.26 - 6.90]).

Uterine height: it was 31cm as a median value with a rate of 77.4% with a (p < 0.001) and an OR of 6.10 (2.55 - 14.53), Kraiem *et al.* [14] in his study had shown that a uterine height < 34cm was a good prognostic element for the uterine test this allowed us to exclude macrosomia and any other kind of uterine over distension this corroborates with that of Flamm *et al.* [15]. Whose success rate was 78% for the group with a birth weight < 4000 grams.

Elkousy M *et al.* [16]. In his study shows that the more the weight of the newborn is increased, the more the risk of failure of the uterine test is also increased. Similarly Weinstein D *et al.* [17] establish a significant difference (p = 0.03) between the weight of newborns born by vaginal delivery on a scarred uterus (2816 g) and that of newborns born (2816 g) and that of newborns born by caesarean section (3011 g).

In view of the difficulty of estimating accurately, either sonographically or

clinically; clinically, the uterine test cannot be contraindicated in the presence of suspected fetal macrosomia (CNGOS recommendation). However, high fetal weight is significantly associated with failure of uterine testing. Uterine distension is a risk factor for uterine rupture.

The female sex was predominant in our study with 52.3% of the newborns being male versus 47.7% male unlike Beena *et al.* [18]. And Soukayna *et al.* [19] did not find any difference for both sexes in their studies.

In our work, we noted neonatal asphyxia in 6.3% of newborns who were resuscitated in neonatology, 3.6% had low birth weight and one neonatal death was recorded.

According to WHO [20], the global stillbirth rate was 61 per 1000 live births in 2009 and the African rate was estimated at 104 deaths per 1000 live births.

This stillbirth rate could be reduced by better monitoring of parturients monitoring, systematic and correct use of the partograph, early referral to the of the partograph, early referral, early evacuation of complicated cases, improved early referral, early evacuation of complicated cases, improved evacuation conditions and the acquisition of for resuscitation of newborns. Similarly, the acquisition of a Neonatology service available on a permanent basis to receive suffering newborns.

The purpose of this study was to determine certain factors that promote the success of uterine testing in parturients with uni- and bi-scared uteri and to extend the protocol to all referral hospitals in the province of South Kivu in the Democratic Republic of Congo (DRC).

This work determined the factors associated with vaginal delivery of patients with uni- or bi-scarred uterus who underwent uterine testing in a level III maternity hospital.

Among other things, it has limitations, particularly the sample and its monocentric nature.

5. Conclusions

The success factors of a uterine test are necessary the elements that contribute to the success of the uterine test and a better maternal-fetal prognosis for the obstetricians and the patient.

The success rate of the uterine test on uni- and bi-scarred uterus is similar in our maternity hospital. However, it remains a practice that requires a good control of complications. Hence the importance of performing it in a structure capable of managing maternal-fetal emergencies and by qualified personnel to carry out this great responsibility, finally to reduce maternal-fetal morbidity and mortality.

The refocused prenatal consultation allows for an awareness of patients with uni- and bi-scarred uterine.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Survey Sheet

1) Identification

NOMS _____ Age _____

tribu: _____ religion _____

Marital status: married/single/widowed/divorced

Occupation: civil servant/housewife/shopkeeper/student/other to be specified

Level of education: 1) primary 2) secondary 3) higher 4) illiterate

Spouse's profession: 1) trader 2) pupil/student 3) civil servant/other to be specified.....

2) Parturient's History:

Obstetrical history: G....P....EV....DCD....AV.....

Number of previous caesarean sections: _____

Caesarean section at PANZI RGH yes/no Number: _____

inter-genesis interval: _____(months)

Last delivery: 1) vaginal route 2) caesarean section

Medical and surgical history:

Q17: medical: 1) asthma 2) cardiac 3) diabetes 4) sickle cell anaemia Sickle cell disease 5) hypertension 6) HIV 7) none 8) other to specify.....

Surgical atcd: EPU/Appendectomy/Cystectomy

Indication for previous caesarean section: 1) SFA 2) Procidence of the cord 3) Hemorrhagic placenta

Hemorrhagic Prævia 4) HRP 5) FPD 6) Bi-scar uterus 7) Severe pre-eclampsia 8) Eclampsia

Other to be specified..... Delivery on scar uterus at PANZI RGH

3) Admission:

Q20: mode of admission: 1) self-referred 2) referred 3) evacuated

Q21: means of transport: 1) ambulance 2) motorbike ambulance 3) Personal means

Q22: reason for admission: 1) painful uterine contraction 2) excessive uterine height 3) scarred uterus 4) Other to be specified.....

Q23: place of referral: 1) health centre 2) medical practice 3) rural maternity hospital

Q24: referral medium: 1) programme 2) referral form 3) ANC booklet 4) no support

4) Clinical Examination on Admission

Q25: Height of the parturient: 00 1) ≤ 150 cm 2) > 150 cm

Q26: Maternal temperature: 1) $< 37^{\circ}\text{C}$ 2) $37^{\circ}\text{C} - 37.5^{\circ}\text{C}$

3) 37.6°C - 38°C 4) >38°C

Q27: Antenatal consultation: 1) yes 2) no

Q28: Place of ANC: 1) csref 2) hospital 3) rural maternity

4) Other to specify.....

Q29: Number of ANC: 1) ANC 2) 1 to 4 ANC 3) >4 ANC

Q30: Period of first ANC: 1) first trimester 2) second Quarter 3) Third Quarter

Q31: Author of ANC: 1) Doctor 2) Midwife 3) Nurse 4) None.....

Q32: Conjunctiva: 1) Well coloured 2) Moderately coloured

Q33: Uterine height:1) HU < 28 cm 2) HU 28 - 33 cm 3) HU ≤ 34 cm

Q34: Term of pregnancy: 1) <37 SA 2) 37 - 40 SA 3) ≥41 SA 4) unspecified

Q35: The frequency of BCF:..... 1) BCF < 120 bat/min 2) BCF120 - 160 bat/min 3) BCF >160 bat/min 4) BCF absent

Q36: Uterine contractions: 1) no contraction 2) Normal 3) Hyperkinesia 4) Hypokinesia

Q37: Water sac: 1) intact 2) ruptured if ruptured time to Rupture.....

Q38: Type of rupture: 1) early 2) premature 3) artificial 4) spontaneous 5) untimely

Q39: Appearance of amniotic fluid: 1) Clear 2) Yellowish 3) meconium 4) bloody 5) greenish 6) pea purée

Q40: Type of presentation: 1) Cephalic from top Q41: Bleeding: 1) Yes 2) No

Q42: Cervical dilatation: 1) Latent phase 2) Active phase 3) expulsive 4) closed cervix

Q43: Pelvis: 1) Normal: YES or NO

Q44: Prognosis of delivery: 1) uterine test 2) Caesarean section immediately

Q45: Test results: 1) Successful (vaginal delivery) 2) Failed (emergency caesarean)

Q46: If Caesarean Indication: 1) SFA 2) cord prolapsed 3) haemorrhagic placenta previa 4) retro-placental haematoma 5) pre-rupture syndrome 6) severe pre-eclampsia 7) eclampsia 8) bi-scarred uterus 9) other to be specified.....

Q47: if vaginal delivery: 1) spontaneous expulsion 2) vacuum 3) forceps

Q48: Intraoperative complication of caesarean section: 1) bladder injury 2) ureteral injury 3) bowel injury 4) haemorrhage 5) other to be specified.....

Q49: Adhesions: 1) Yes 2) No

Q50: Type of delivery: 1) Natural 2) Active 3) Artificial 4) Other.....

Q51: Delivery complication: 1) Absent 2) Bleeding

Q52: If hemorrhage: 1) atony 2) retention 3) uterine rupture 4) DIC 5) Tear of the cervix 6) Vaginal tear 7) Tear of the perineum

5) Mother's condition after delivery

Q53: Alive: 1) Yes 2) No

Q54: if dead cause of death: 1) haemorrhage 2) hypertension 3) other
Cause to be specified.....

Q55: post partum or post caesarean complications: 1) haemorrhage 2) infections 3) thrombophlebitis 4) hypertension 5) other to specify.....

6) Condition of the newborn

Q56: Status of newborn(s) at birth: 1) Alive 2) Dead

Q57: Apgar 1st min 1) ≤ 7 , 8 - 10, None: 2) Apgar 5th min: ≤ 7 , 8 - 10 3) None

Q58: Birth weight: 1) weight < 2500 g 2) 2500 - 3000 g 3) weight \leq 3500 g

Q59: Sex: Female OR Male

Q60: Height 1) Height < 47 cm 2) ≥ 47 cm

Q61: Resuscitated neonate: 1) Yes 2) No

If resuscitated: 1) successfully resuscitated 2) unsuccessfully resuscitated

Q62: Duration of resuscitation: 1) ≤ 20 minutes 2) ≥ 20 minutes