

## Interest in the Classification of Caesarean Section According to Robson at Teaching Hospital GABRIEL TOURE at Bamako, Mali

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### ABSTRACT

Caesarean section rates (CSR) are steadily increasing worldwide with levels exceeding the maximum recommended by the WHO. To identify factors that may contribute to the improvement of CSR and to ensure an audit and feedback mechanism, we conducted this study of C-section according to Robson's classification that identifies 10 mutually exclusive groups based on obstetric characteristics. This was a cross-sectional study from January 1, 2003 to December 31, 2013 on parturients who gave birth in the obstetrics department of the Gabriel TOURE University Teaching Hospital (UTH), which is a 3<sup>rd</sup> level health structure. We recorded 28,376 deliveries with 9,509 cases of C-section, with a rate of 33.5% (9,509/28,376). Robson's classes 3, 1, 5 and 10 constituted the largest populations and were the greatest contributors to the overall CSR with 7.6%, 7.4%, 5.9% and 5.4% respectively. The emergency admission (evacuation) rate was particularly high among Robson classes 5 and 3 with 57.1% and 46.6% of parturients evacuated, respectively. Classes 1, 3, and 10 had the highest number of cases and indications for emergency C-section. We recorded 298 cases of maternal death or 1.05% (298/28,376) of which 180 or 1.9% (180/9,509) of maternal death related to C-section, it was higher in groups 1, 3 and 10 with respectively 17.8%, 26.6% and 31.6% of cases of death. For fetal prognosis, the overall rate of stillbirth by C-section was 9.2% and was worse in groups 10, 7, 3 and 4 with 23.2%, 10.7%, 9.8% and 9.2% of stillbirths respectively. The stillbirth rate was higher in classes 9 and 10.

### Keywords

C-section, Rate, Robson's classification, Prognosis.

### Introduction

Caesarean section rates (CSR) are steadily increasing worldwide with levels exceeding the maximum recommended by World health organization (WHO) [1]. In developing countries, these rates remain low, below the minimum level of 5% recommended by WHO. In Mali according to the reports of the statistical yearbook of the National Directorate of Health, the rate remained below 3% in 2015 and 2018 [2]. At the Point G hospital, the

rates varied from 13.8% in 1988, 20.88% in 1991 to 24.05% in 1996 [3], 23.1% in 2005 [3] and 25.5% [4]. At the maternity unit of Kayes Regional Hospital, the CSR was 7.5% in 2005 [5] and 15.3% in 2006 [5]. A similar study was conducted in the referral health centers and hospitals in the regions of Kayes, Koulikoro, Sikasso, Gao, and the Bamako district, which pointed out a CSR of 19.5% [6]. Classically, indications for C-section were based on clinical elements such as maternal or obstetrical and fetal complications [7,8]. In order to help identify factors that could contribute to the improvement of CSR and to ensure an audit and feedback mechanism, we initiated an analysis of

C-section according to the Robson classification, which identifies 10 mutually exclusive groups based on obstetrical characteristics [9]. Robson's classification groups gestational carriers by number of fetuses, fetal presentation, parity, obstetrical history (scarred uterus), mode of labor onset, and gestational age; this provides interesting clinical categories for analysis and reporting of CSRs. We initiated this work to study cesarean section rates according to Robson's classification in order to identify those for which specific interventions are necessary to adjust the cesarean section rate and improve the perinatal prognosis at the Gabriel Touré University Teaching Hospital (UTH).

## Methodology

The study took place from January 1<sup>st</sup>, 2003 to December 31, 2013 at the Gabriel Toure UTH, which is a 3<sup>rd</sup> level health structure. The hospital is currently one of the last resorts for the population of the Bamako district and for other references in the country. This was a retrospective descriptive and cross-sectional study of parturients who delivered in the service. It consisted of all women who were admitted during gravid puerperium to the obstetrics gynecology service during the study periods. These women could be admitted directly or referred from other structures with or without emergency. All pregnant women with a term of at least 22 WA and a birth weight of at least 500 grams who gave birth in the department were included. We performed an exhaustive sampling. We used a complete obstetrical database including all obstetrical admissions and focused on the characteristics of the women admitted: mode of admission, sociodemographic profile, route of delivery, indications for C-section, and maternal-fetal prognosis. Data were collected from obstetrical records. We also used delivery registers, midwife's notebooks on duty, operative report registers, and registers of admissions to intensive care, as needed. The database was designed and completed on SPSS version 16.0 software with double entry to ensure data reliability and regular updating. The different Robson's groups and their characteristics are represented in the Table 1 below.

**Table 1:** Robson's classification.

Groups	Characteristics
1	Nulliparous, single cephalic, ≥ 37 weeks, in spontaneous labor
2	Nulliparous, single cephalic, ≥ 37 weeks, induced or CS before labor
3	Multiparous (excluding prev. CS), single cephalic, ≥ 37 weeks, in spontaneous labor
4	Multiparous (excluding prev. CS), single cephalic, ≥ 37 weeks, induced or CS before labor
5	Previous CS, single cephalic, ≥ 37 weeks
6	All nulliparous breeches
7	All multiparous breeches (including prev. CS)
8	All multiple pregnancies (including prev. CS)
9	All abnormal lies (including prev. CS)
10	All single cephalic, ≤ 36 weeks (including previous CS)

## Results

### Frequency

During this study period, we recorded 28,376 deliveries with 9,509 cases of C-section, or a rate of 33.5% (9,509/28,376). Robson's

classes 3, 1, 5, and 10 had the largest populations and were the largest contributors to the overall CSR with 7.6%; 7.4%; 5.9%; and 5.4%, respectively. The cesarean delivery rate was highest in classes 9, 2, 4, and 5 with 94.6%; 91.2%; 88.8% and 74.7% of deliveries respectively. The CSR in each Robson class and their relative contributions are shown in Table 2.

### Sociodemographic and temporal characteristics

The rate of emergency admission (evacuation) was particularly high among Robson class 5 and 3 cesareans with 57.1% and 46.6% of parturients evacuated, respectively. Regardless of the time or mode of admission, group 5, 3<sup>rd</sup> contributor to the overall cesarean rate was the most represented followed by group 1, 2<sup>nd</sup> largest contributor to the overall cesarean rate. Classes 1, 3, and 10 lead in numbers and indication for emergency C-section.

It appears that about 10% of group 1 and 13% of group 6 did not have any consultation during the pregnancy, while these groups are at risk and the same remarks are made of groups 3 and 10 with respectively 11.5% and 14.06% of not performing ANC.

The mean age was 26.34 years with extremes from 10 years to 49 years. The 20-34 age group were the largest contributors to the CSR with a frequency of 64.1% followed by adolescents who accounted for 19.4% and 16.3% for women aged 35 years or older. Classes 1, 10, and 2 were classes 5, 3, and 1 occupied the most represented among C-sections with maternal age between 10-19 years; while among C-sections with maternal age between 20-34 years. For C-sections with maternal age greater than or equal to 35 years, classes 3, 1, and 5 occupied the top three ranks. Regardless of the time and age group, group 5 had the highest rate of cesarean delivery whether ANC was performed or not, followed by group 1 and group 3.

### Maternal-Fetal Prognosis

We recorded 298 cases of maternal death, with 1.05% (298/28,376), of which 180, or 1.9% (180/9,509) were in women who delivered by C-section. The maternal death rate related to C-section was 1.9% (180/9,509), and was higher in groups 1, 3 and 10 with 17.8%, 26.6% and 31.6% of deaths respectively. The maternal mortality ratio was higher in classes 10, 3 and 4 with 4,880.13, 2,766.79 and 2,440.26 per 100,000 births respectively. Hypertension and its complications were the first direct cause of maternal death and very dominant in class 10 with 43, 2.1% (38/88) of deaths related to hypertensive complications and in class 1 with 21.6% (19/88) of deaths by hypertensive complications. Hemorrhagic complications were the second direct cause of maternal death with 6.7% (12/180) and more represented in Robson's class 3 with 30.7% of deaths by hemorrhagic cause (12/39). Regarding fetal prognosis, the overall stillbirth rate by C-section was 9.2% and was worse in classes 10, 7, 3 and 4 with 23.2%, 10.7%, 9.8% and 9.2% stillbirths respectively. The stillbirth rate was higher in class 9 with 325.58 per 1,000 live births followed by class 10 with 302.22 per 1,000 live births. The number of neonatal deaths among women who delivered by C-section was 876 or 9.2% (876/9509) and was higher in groups

**Table 2:** Caesarean section rate according to Robson's classification at the maternity unit of Gabriel TOURE UTH.

	A	B	C	D	E
Robson's class	Number of C-sections in each group	Number of women in each group	C-section rate in each group A/B) ×100	Relative size in each group (B/Total delivery) ×100	Contribution of each group to the overall C-section rate (A/Total delivery) ×100%.
1	2089	4391	47.5 (2089/4391)	21.9	7.4
2	428	469	91.2 (428/469)	4.5	1.5
3	2183	12138	17.9 (2183/12138)	22.9	7.6
4	837	942	88.8 (837/942)	8.8	2.9
5	1663	2224	74.7 (1663/2224)	17.5	5.9
6	47	135	34.8 (47/135)	0.5	0.2
7	121	312	38.7 (121/312)	1.3	0.4
8	391	1031	37.9 (391/1031)	4.1	1.4
9	228	241	94.6 (228/241)	2.4	0.8
10	1522	4404	34.5 (1522/4404)	16	5.4
TOTAL	9509	28376	33.5(9509/28376)	100.00	33.5

10, 3, and 2. Class 10 had the highest early neonatal mortality rate at 89.04 per 10,000 live births followed by class 8 at 65.93 per 10,000 live births. Classes 1, 3 and 10 collectively accounted for 72.8% of the perinatal mortality rate (8.1% for class 1, 24.4% for class 3 and 40.3% for class 10).

## Discussions

The analysis of our results revealed three main findings:

The CSR was increasing significantly in our facility. The overall frequency of C-section in our study was 33.5%. However, a similar study conducted in Mali found out a CSR of 19.5% and another study in Mali reported a frequency of 14.6% [10].

Many other authors have reported high CSR in developing and developed countries. Thus, Mbungu M. [11] in DRC in 2015 found a caesarean rate of 31.2%, Koffi A [12] a rate of 42.8% in Cocody in RCI in 2015, Zongo A et al. [13] 33.3% in Bogodogo (Burkina Faso) in 2015 and Leroy Ch., Robson's classes 3, 1 and 5 constitute the largest obstetrical populations in terms of numbers, contribution to the cesarean section rate, but also in terms of maternal-fetal complications with 72.8% of maternal deaths Téguété I et al. [4] figured out 78.2% for the same groups. Similar results have been reported in the literature by some authors: in the DRC by Mbungu M.R [11], in Burkina Faso [15], in Brazil [16], in Tanzania [17] and in Canada [18]. Our result is similar to that of Mbungu M.R [11] who found out as major indication for group 1 fetopelvic disproportion with 53.1% and eclampsia 25.5%, Coulibaly A [19] figured out 49.3% indication for acute fetal suffering and 53.9% for fetopelvic disproportion (FPD), Bambara M et al. [20] found 18.54% indication for C-section for acute fetal distress (AFD), 15.94% for FPD and 15.12% for eclampsia.

In-group 3 the indications for C-section were dominated by AFD with 26.8%, 14.8% for labour failure and 13.4% for eclampsia. Mbungu M.R. [11] reported similar trends with 38.1% for AFD and 36.6% for FPD, Coulibaly A [19] found out 36.5% for FPD. As for group 5, the major indication for C-section found in our study was iterative C-section for previous C-section with 34.1% of the indications for C-section in the group and 22.8% for pelvic

pathologies on a scarred uterus. Coulibaly A [19] found 82.7% of C-sections indicated for scar uterus and Mbungu M.R [11] pointed out 86.6% of C-sections indicated for scar uterus. It is deplorable to note that more than 4.4% of group 5 did not undergo any ANC and were admitted in 57.1% of cases by evacuation in an emergency context. This accounts for their high emergency CSR of 66.9% (1112/1663). In order to overcome the complications associated with C-section, patients with at least one uterine scar should have a non-emergency C-section (prophylactic or scheduled). The rate of per-section complications represented 41.9% (41/111) of all per-section complications. These complications were mostly hemorrhagic in 45.3% (29/64) of the intra-caesarean complications, and bladder injuries in 34.8% (8/23) of the bladder complications. The CSR was higher in-group 9 with 94.6% of deliveries by C-section in our study. Zongo A and al [13] found 100% cesarean delivery in the group. This is due to the fact that group 9 includes all dystocic presentations that absolutely indicate cesarean delivery. It is very important to note that the rate of admission by evacuation is very high in this group (40.3%) with a low rate of realization of C-section 92.5%, which suggests that the vicious presentation is unrecognized for the most part. To improve the maternal-fetal and neonatal prognosis, it is important that these presentation dystocia's are known in time so that a plan of safe delivery is assigned to them outside of any emergency. The aspect of prevention of pregnancy complications is not as desired. In fact, although we have adhered to the WHO recommendations through the adoption of the refocused prenatal consultation strategy, its implementation remains insufficient. Prenatal coverage is still not optimal and the quality of ANC is not very satisfactory. According to the last demographic and health survey in Mali, 25% of pregnant women had not performed any ANC [CPS, 2014] [21]. The non-realization of prenatal consultations and their lower quality are strongly correlated with emergency C-section before the onset of labor as well as with high perinatal mortality Råssjö EB et al., 2013 [22].

## Conclusion

To achieve the goals of reducing maternal, fetal, and neonatal deaths and to keep the CSR within the range considered acceptable,

it is important to focus on monitoring the 3 groups (Group 3, 1, and 5) that contribute most to the overall CSR through quality follow-up.

Robson's classification allows better targeting of gestational groups and indications requiring special attention in order to not only appropriately indicate cesarean surgery but also improve maternal and perinatal prognosis.

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