

Profile of primary caesarean section at Musienene Hospital in North Kivu, Eastern DRC

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SUMMARY

Introduction. The rate of cesarean section has increased in recent decades and primary caesarean section (PCS) seems to be prominent. The objective of this study was to determine the rate and factors associated with PCS at Musienene Hospital.

Methods. It was a retrospective cross-sectional study. It involved 466 singleton pregnancies with no previous Caesarean Section (CS) scar, in 2016. Data were analyzed with Epiinfo software version 7. Chi-square was used to test the independent variables that can influence the mode of delivery, the relative risk to evaluate the degree of influence of each of the variables to the mode of delivery of the laboring women.

Results. The rate of PCS was 23.2%. Mothers aged less than 20 years were 3.9 times as likely to deliver by cesarean section. Nulliparous women were 2.54 times more likely to undergo cesarean than multiparous. Mothers admitted during the night-shift were 2.74 times more likely to undergo caesarean section than those who were monitored during daytime care.

Conclusion. The general CS rate as well as the primary cesarean section rate is very high at Musienene HGR. Most frequent during night shift in adolescent and nulliparous. Staff level, especially at night needs to be improved. The staff needs to be introduced to current maternity guidelines, and introduction of CS Audit will help in reducing the high rate. Raising community awareness of the risks associated with early pregnancy.

Key words. Primary caesarean section, risk group, DRC.

RESUME

Introduction : Le taux de césariennes ne cesse d'augmenter au cours de ces dernières décennies ; la césarienne primaire semble occuper une place prépondérante dans cette flambée. Ce travail avait pour objectifs de relever le taux de césarienne primaire et d'identifier les groupes à risque de subir cette césarienne, à l'HGR Musienene en 2016.

Patients et méthodes. Cette étude descriptive, exhaustive et rétrospective a concerné 1194 dossiers des parturientes sans antécédent d'utérus cicatriciel. Pour l'analyse statistique, nous avons recouru au logiciel EpiInfo version 7 en utilisant le Chi-carré pour tester l'indépendance des variables pouvant influencer le mode d'accouchement. Le risque relatif a été calculé afin d'évaluer l'influence des variables au mode d'accouchement.

Résultats. Le taux de césariennes primaires était de 23,2%. L'âge inférieur à 20 ans et la nulliparité multipliaient respectivement par 3,9 et 2,54 le risque d'accoucher par césarienne. Les parturientes surveillées pendant la garde-nuit avaient 2,74 fois plus de risque de subir une césarienne que celles surveillées pendant la garde-journée.

Conclusion. La proportion de césarienne primaire est très élevée à Musienene. Une bonne formation du personnel de santé et une responsabilisation des prestataires sur les indications de la césarienne peuvent contribuer à la réduction de cette flambée de césariennes.

Mots-clés. Césarienne primaire, groupe à risque, Democratic Republic of Congo

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INTRODUCTION

In most countries of the world, the proportion of deliveries by caesarean section has been steadily increasing in recent decades [1]. In the developed countries, this raise concerns in both countries with low caesarean section rates, such as Iceland (14.7%), the Netherlands (15.6%) and Sweden (16.5%), and those with high rates such as the United States of America (30%), Mexico (49%), Germany (31.1%), Italy (37.1%) [2, 3, 4].

In Africa, the trend of the caesarean rate also follows an upward curve; however, there are differences depending on the environment: in rural areas, the rates are low (less than 5%) whereas in urban areas these rates are above 30% [5].

The Democratic Republic of Congo (DRC) is not an exception. Caesarean section rates increased from 4% in 2007 to 15% in 2013 with disparities seen in some areas such as in the eastern part of the country where: Lubumbashi has had a rate of 11.36% [6] and Kabinda a rate of 26.77% [7].

However, in 1985 the WHO stated that it is clearly not justified that in a given geographical area more than 10-15% of deliveries be performed by caesarean section [8]. Presence of high rate above the WHO recommended rate might suggest that primary Cesarean occupies a prominent place in the rise, since after a caesarean Section, the risk of further caesarean increases for the next Pregnancy as predicted by Dr. Edwin Cragin in 1916 "Once a Caesarean Section, Always a Caesarean Section" [9,10].

Taking into account all of the above, we raised the following research question: "Is the rate of primary Caesarean sections at the HGR / Musienene related to certain risk factors such as the age of the mother , the nulliparity or the time of the day they are performed? "

The present study therefore set the objective of identifying the rate of primary caesarean section and identifying the group of mothers at risk for Caesarean section and predisposing factors. Better management of the preventable factors that put these mothers at risk would help

to reduce the rate of first cesarean section and, in turn, that of repeated caesarean section in our facilities.

PATIENTS AND METHOD

Study setting

Musienene General Referral Hospital is located in the Musienene rural health zone, in North-Kivu province, 17 km south of the City of Butembo. This Health Zone is supported by the European Union through the Accelerating Progress towards Millennium Development Goals (MDGs) 4 and 5. Service delivery tariff is a fixed rate regardless of the mode of delivery.

This health facility has the capacity of 317 beds including 78 beds for maternity wards and employs five medical officers (there are no obstetricians & gynecologist), 17 midwives, among them 8 trained in Safe Motherhood and Emergency Obstetric and Neonatal Care (EmNOC). The surrounding health centers / health posts are in a radius of 10 km distance to the hospital. Night duty is provided by one on-call doctor for the whole hospital and two midwives who cover all the activities of the gynecology and obstetrics wards.

Type of study

This was a retrospective cross-sectional study.

Study population and inclusion criteria

It was an exhaustive study that involved 1,194 mothers without prior cesarean section or scarred uterus, living within the Musienene health zone and admitted in labor at the Musienene General Referral Hospital maternity, with a term singleton pregnancy, in 2016.

We excluded mothers with scarred uterus regardless of the cause and those who had been referred for a true indication of caesarean section, multiple pregnancies, and those from other Health Zones.

Data were collected using a data collection form which included collection of epidemiological parameters of each woman.

Study variables

Variables collected included: mode of delivery, age of the mother, marital status, parity, time of delivery, shift of admission for labor day duty from 7 am to 6 pm or night duty starting from 6 pm to 7 am next day ; and finally, onset of labor: spontaneous or induced.

Statistical analysis

Data were analyzed using EPIINFO v7. Results were presented in Tables as Frequency and Percentage. In the 4x4 table analysis, the Pearson Chi² test was used to test the equality of two proportions of independent samples. The relative risks (RRs) were estimated and their 95% confidence intervals (95% CI) calculated to measure the strength of the association between the mode of delivery and the independent variables considered.

Ethical considerations

We sought and obtained permission to conduct the study from the Musienene Health Zone Management Board and the Musienene General Referral Hospital Ethics Committee.

RESULTS

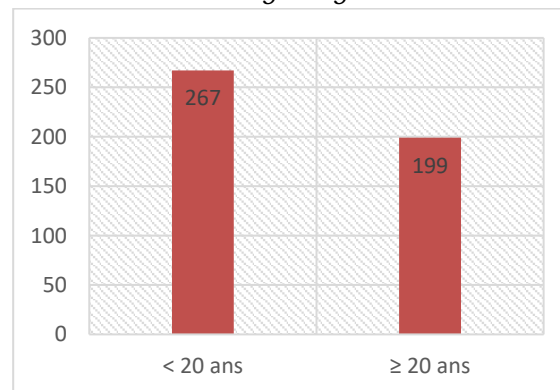
There were 2005 total deliveries in 2016 at the hospital. Among them, 1089 were caesarean sections, giving a Caesarean Section Rate of 54.3%. Among these sectioned women, 466 mothers had no previous scar, giving a rate of primary caesarean section (PCS) of 23.2%

As shown in Graphics 1 and 2, the majority of our patients were less than 20 years old (57.3%). Our study population age ranged between 14 and 47 years old with a mean age of 25.8 ± 7.5 ; the most of the primary CS were in nulliparous (71%), the parity ranged between 1 and 12.

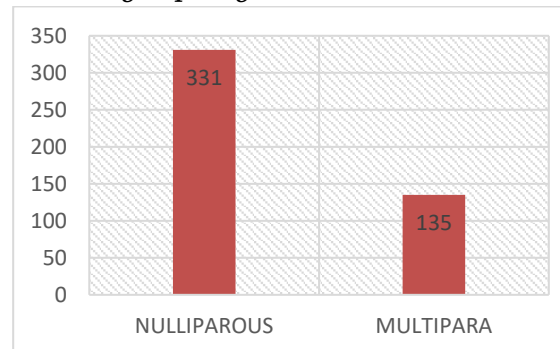
According to table I, maternal indications of cesarian section were the most frequent (52.8%, 246/466). According to the latter contracted pelvis occupied the first place (26.6%, 124/466) followed by cervical dynamic dystocia (8.2%, 38/466). In

regards to fetal indication, in the first place we noted malpresentation (24.4, 114/466) followed by fetal distress (18.7, 87/466). Chi-square was calculated based on maternal and fetal indications. We noted that the maternal indications were most frequent as indication in PCS in nulliparous than in multipara. (Chi-square 3.84 with a p-value <0.001).

Graphic 1: Distribution of primary caesarean according to age



Graphic 2: Distribution of pregnant mothers according to parity



Further analyze shown in Table II, found that patients who are below 20 years old were 3.9 times more likely to undergo cesarean than those over 20 years of age. Furthermore, nulliparous were 2.5 times more likely to deliver by caesarean section. Finally, night shift admission for labor exposed patients to caesarean section up to 2.74 times more than those monitored during the day. However, there was no proven relationship between a height ≤ 150 cm of patients and having a cesarean section ($p = 0.66$), as well as the marital status ($p=0.06$).

Table I: Indications for caesarean section

Indication	Nulliparous n(%)	Multiparous n(%)	Total n(%)
Maternal	213(47.7)	33(7.1)	246(52,8)
Contracted Pelvis disease (CPD)	124(26.6)	0(0.0)	124(26.6)
Cervical Dynamic Dystocia (CDD)	33(7.1)	5(1.1)	38(8.2)
Failed Induction	27(5.8)	2(0.4)	29(6.2)
Impending Uterine Rupture	6(1.3)	8(1.7)	14(3.0)
Old Primigravida	14(3.0)	0(0.0)	14(3.0)
Precious Pregnancy	3(0.6)	5(1.1)	8(1.7)
Pre-Eclampsia	2(0.4)	6(1.3)	8(1.7)
Condylomata	4(0.9)	2(0.4)	6(1.3)
Tubal Ligation	0(0.0)	4(0.9)	4(0.9)
Bronchial Astma	0(0.0)	1(0.2)	1(0.2)
Foetal	118(25.3)	102(21.8)	220(47.2)
Malpresentation	45(9.6)	69(14.8)	114(24.4)
Foetal Distress	68(14.6)	19(4.1)	87(18.7)
Placenta Abruption	2(0.4)	5(1.1)	7(1.5)
Placenta Praevia	3(0.6)	4(0.9)	7(1.5)
Cord Prolapse	0(0.0)	5(1.1)	5(1.1)
Total	331(71.0)	135(29.0)	466(100)

Table II: Epidemiologic profile of pregnant and mode of delivery

	Caesarean n(%)	Vaginal birth n(%)	RR	Chi-square	P-value
Age					
<20	267(87)	40(13)	3.95	1344.6	< 0.001
≥20	199(22)	688(78)	1		
Parity					
Nulliparous	331(56)	257(44)	2.54	145.1	<0.001
Multiparous	135(22)	471(78)	1		
Height(cm)					
≥150	245(41)	348(59)	1.10	2.5	=0.66
<150	221(37)	380(63)	1		
Marital status					
Single	311(45)	375(55)	1.45	27.4	=0.06
Married	155(31)	353(69)	1		
Time of work					
Night shift	379(52)	353(48)	2.74	128.2	<0.001
Day shift	87(19)	374(81)	1		

DISCUSSION

The objective of this study was to evaluate the rate of primary cesarean section (PCS) and determine the factors associated with it at Musienene General Referral Hospital. Overall, the caesarian section rate was 54%. This rate was three times higher than the WHO [8] recommended threshold of 10 to 15%, and almost the same as the one found by Saha et al. in Dhaka, Bangladesh (57.87%) [11]. It also exceeded the average found in other continents, like the Latin America and the Caribbean region (40.5%),

Northern America (32.3%), Oceania (31.1%), Europe (25%), Asia (19.2%) and Africa (7.3%) [12].

TRAORE in Bobo-Dioulasso [6] found a rate of 19.96% at the teaching hospital maternity. The high rate in Musienene might be due to shortage of personnel in maternity unit leading to poor monitoring of women in labour, with easier way out being surgery. This hospital has only one doctor covering the whole hospital and two midwives covering maternity and gynaecology ward during the night shift. The hospital should try to improve on the staff level ratio.

During the study, the PCS rate was 23.2 % (466/2005). This is double of the result of studies conducted in a maternity level 1 in France which found a rate of 10.2% [13]. But the rate was almost a third of what was found in Dhaka by Sala et al. [9] who found 74.34% of PCS and a half of the rate found in India by Mahima Jain (55.8%) [14].

The number of deliveries involving PCS has been increasing progressively in many countries. In Italy, rates rose from around 10% in the early 1980s to 26 % in 2013[15]; in the United State the middle rate of PCS was 30.8 at 2013. [16]. The probability of cesarean delivery is very high (over 95%) among women who have already given birth by this procedure. So, the proportion of deliveries with PCS is one of the most frequently used indicators of quality of care at international level [16, 17].

In a consensus opined by the ACOG, it called for Safe reduction of the rate of primary cesarean deliveries in USA. They stated that this will require different approaches for example, the necessity to revisit the definition of labor dystocia, improving and standardizing fetal heart rate interpretation and labor management[18]. With the shortage noted at this hospital, the need of standardized monitoring guideline is necessary and to try to reduce this high rate. Further studies should look into this issue.

Lasnet [19] has demonstrated that regular review of caesarean section cases by clinical staff is an effective strategy to reduce caesarean section rates. An Audit of PCS in Karachi led to reduction of the rate [20].

Review of caesarean at Musienene general Hospital must be introduced to reduce their high rate by ensuring the proper indications of CS are done.

Our study found that about two third of women operated were less than 20 years old (57.3%). Controversially in study at Dhaka, Saha [11] found that the PCS were

frequent in those pregnant which age is high than 20 years. The large number of Adolescent in our study might be due to the fact that most are just been married, the marriage age being 18 years and that the custom is that as soon as married, the first thing is to get a child. So, this can explain this high rate. For that same reason, the study found a high number of Nulliparous or primigravida. This was similar to the findings by Saha [11]. In Bangladesh. Nulliparous being considered as high risk, this might also put them in risk of having CS. In a study conducted by Iacobelli et al [21] who compared primiparous group with teenage and adults, he didn't find any risk related to age as a factor of caesarean. For Burn [22] and Guihard [23], primiparous are predisposed to abnormalities of uterine activity, cervix and soft-tissue, since their pelvis has never been tested. This would explain this rise in cesarean section rates in primiparous than in multiparous. However, guidance from a standardized guideline is necessary in the hospital.

Concerning the PCS indications, this study found, in order of importance, CPD (26.6%), malpresentation (24.4%) and fetal distress (18.7) to be the main reasons for the PCS at Musienene Hospital. In Dhaka, the main indications were foetal distress (35%), pre-eclampsia (14%) and cervical dystocia (12%) [11]. As stated by the ACOG, improved and standardized foetal heart rate interpretation and management may have an effect in reducing this rate [18]. Proper diagnosis of CPD is necessary as it condemn the woman to further CS. Therefore, there is a need for a proper assessment and monitoring during labor. Putting in place a protocol or guideline and training staff on it is necessary. In the province of North Kivu, the gynecology and obstetrics guideline provided by European Union (EU) is available [24] but its use by health workers is not institutionalized. Each health worker makes an indication based on his own experience or personal impression. The analysis of our data didn't show a height less than 150cm to be a predisposing factor caesarean section. This is similar to what Mogren et al. [25] found in Sweden.

This study shows that PCS was very high during the night shift than those of day shift. At Musienene HGR, the number of nursing staff during the night shift is reduced (two) compared to that of the day shift (8 staff). This reduced number of staff during night shift could have a repercussion on labour monitoring. To relieve staff in monitoring duties, staff can revert to doing CS. ESTRYN BEHAR [26] , state that good hospital ergonomics avoids the “night work paralysis syndrome” (i.e. somnolence between 1 am and 5 am). This syndrome could also be the basis of a decline in the quality of care after midnight.

CONCLUSION

The general CS rate as well as the primary cesarean section rate is very high at Musienene HGR. Most frequent during night shift in adolescent and nulliparous. Staff level, especially at night needs to be improved. The staff needs to be introduced to current maternity guidelines, and introduction of CS Audit will help in reducing the high rate. Raising community awareness of the risks associated with early pregnancy.

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