

Case series



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 Antoine Tshimbundu Kayembe, Sylvain Mulumba Kapuku

Corresponding author: Antoine Tshimbundu Kayembe, Department of Gynaecology and Obstetrics, Faculty of Medicine, University Notre-Dame of Kasayi, Central Kasai, Democratic Republic of the Congo. antoinetshimbundu@gmail.com

Received: 18 Apr 2022 - **Accepted:** 02 Aug 2022 - **Published:** 29 Aug 2022

Keywords: Caesarean section, epidemiology, indications, Provincial General Hospital, Kananga

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Cite this article: Antoine Tshimbundu Kayembe et al. Caesarean section: epidemiology and indications at

Available online at: <https://www.panafrican-med-journal.com//content/article/42/317/full>

Caesarean section: epidemiology and indications at General Provincial Hospital of Kananga

Antoine Tshimbundu Kayembe^{1,&}, Sylvain Mulumba Kapuku¹

¹Department of Gynaecology and Obstetrics, Faculty of Medicine, University Notre-Dame of Kasayi, Central Kasai, Democratic Republic of the Congo

&Corresponding author

Antoine Tshimbundu Kayembe, Department of Gynaecology and Obstetrics, Faculty of Medicine, University Notre-Dame of Kasayi, Central Kasai, Democratic Republic of the Congo

Abstract

The aim of our study is to describe the epidemiological profile and indications for caesarean section at the maternity ward of the Provincial General Hospital of Kananga from January 1st 2014 to December 31st 2020. This is a descriptive study of a series of cases from the medical records of cesarean patients and based on non-probabilistic sampling of suitability for cases selection. The sample of our study is composed of 1395 cases. The frequency of caesarean section is 16.10% with an annual average of 199.30 (SD 18.20) cases per year, the average age of patients is 25.39 years (SD 1.23), the primiparity is the most affected with 27.38 %, hemorrhagic placenta previa

is the most common indication in 26.86%, maternal complications is present in 46.73% and the maternal mortality rate due to cesarean section is 531 per 100.000 live births. The practice of caesarean section constitutes a real problem and our results can serve as a basis for in-depth studies on indications and maternal complications of caesarean section in order to reduce the risks associated with the practice of caesarean section in our environment.

Introduction

The caesarean section is an artificial delivery technique that allows fetal extraction after surgical opening of the uterus. Its purpose is to save the newborn and the mother in situations of fetal distress or dystocia [1, 2]. The frequency of the caesarean section has continued to increase in recent decades, but this increase differs enormously from one country to another and in the same environment, from one medical institution to another [3, 4]. The reasons are multifactorial and not always defensible: changes in maternal characteristics and professional practice styles, increased pressure for malpractice, as well as economic, organizational, social and cultural factors have all been implicated [5, 6]. To these are added the advances in surgery, anesthesiology and blood transfusion ensuring a certain safety in the realization of the cesarean section [7]. In low-resource countries, the frequency of caesarean sections increased from 1.9% to 6.1% [3].

In the Democratic Republic of Congo (DRC), the latest Demographic and Health Surveys report that caesarean section rates rose from 4% in 2007 [8] to 5% in 2013 [9]. As the frequency of caesarean sections increases, the relative importance of the various indications changes. Although rates of elective caesareans are increasingly high in developed countries [10], emergency caesareans are still too frequently performed in sub-Saharan Africa [11, 12] despite the deleterious effect on fetal and maternal prognosis by significantly increasing the related morbidity and mortality [13]. The lack of epidemiological data on the caesarean

section in our milieu prompted us to conduct this study, the aim of which is to describe the epidemiological profile and indication of caesarean sections at the maternity of Provincial General Hospital (PGH) of Kananga from January 1st 2014 to December 31st 2020.

Methods

Study design and setting: this is a descriptive study of a series of caesarean section cases recorded at the maternity ward of the PGH of Kananga from January 1st 2014 to December 31st 2020. The PGH maternity ward was chosen because its situation as the second provincial reference hospital for cases, the presence of trained and experienced staff, and the high attendance of patients who trust its staff.

Study population: we used the medical files of patients aged between 16 and 45 years old who underwent caesarean section recorded at the maternity unit of PGH of Kananga from January 1st 2014 to December 31st 2020.

Sampling: our sampling is non-probabilistic of convenience. The sample size was determined by the limitation of our study in time and space. The following criteria allowed us to include the patients in the study: patients aged between 16 and 45 years old, having undergone caesarean section at the maternity of PGH of Kananga from January 1st 2014 to December 31st 2020 and whose medical file was full. Patients who did not meet these inclusion criteria and incomplete medical files were excluded.

Collection of data: data were collected from operating room registers, maternity registers, patient medical files of the maternity of PGH of Kananga and the data collection record. The variables of our study are: year of study, age of patients, parity, indication of cesarean section, complications of cesarean section, treatment initiated and post-therapeutic evolution.

Statistical analysis: data were analyzed using Statistical Package for Social Sciences (SPSS)

software version 20. We used the average (SD) to present the quantitative variables and the proportion to present the qualitative variables.

Ethical considerations: principles of medical ethics and documentary studies rules have been respected; the data were collected confidentially and treated anonymously.

Results

Frequency of caesarean section: we recorded 1395 caesareans out of 8668 deliveries at the maternity unit of PGH of Kananga during the study period, i.e. a hospital frequency of caesareans of 16.10%, the evolution of which during the period of our study varied from 16.26% in 2014 to 16.41% in 2020 with a peak of 17.99% in 2018 and a low frequency of 15.21% in 2015. The average caesarean section case is 199.30 (SD 18.20) cases per year (Figure 1).

Age and parity of patients: the age group most affected by caesarean section is between 16 and 20 years old with 433 cases or 31.02% and the average age of patients is 25.39 years (SD 1.23). Primiparity was encountered in 382 cases or 27.38%, pauciparity in 347 cases or 24.87%, multiparity in 363 cases or 26.02% and grand multiparity in 303 cases or 21.72% (Table 1).

Indications and complications of caesarean section: hemorrhagic placenta previa is encountered in 375 cases or 26.86%, foeto-pelvic disproportion in 192 cases or 13.85%, dynamic dystocia complicated by acute fetal distress in 209 cases or 14.95%, uterine rupture in 185 cases or 13.29%, the pelvis narrowed in 93 cases or 6.64%, prolapse of the beating cord in 100 cases or 7.17%, transverse presentation in 97 cases or 6.92%, fetal malposition in 97 cases or 6.92% and other indications in 47 cases or 3.40%. 65.0% of caesarean sections were performed in a context of obstetric emergencies from the outset, 40.50% after attempted vaginal delivery and 4.50% in a scheduled or elective manner. As for complications of caesarean section, they are present in 610 cases or 46.73% (Table 2).

Initiated treatment and post-therapeutic evolution: blood transfusion is encountered in 204 cases or 33.44%, surgical repair in 301 cases or 49.34% and other treatments in 105 cases or 17.21%. As for the post-treatment evolution, it is characterized by maternal death in 45 cases corresponding to 531 maternal deaths per 100.000 live births (Table 2).

Discussion

The hospital frequency of caesarean section was 16.10% at the maternity ward of the PGH of Kananga. Its evolution during the period of our study varied from 16.23% in 2014 to 15.19% in 2020. Our frequency of caesarean section is around three times that observed in the general population in the DRC [9]. It is superior to that of *kinenkinda et al.* in Lubumbashi [14], that of *Chu et al.* in the 4 health districts of 3 African countries (DRC, Burundi and Sierra Leone) [11] and those of *Cavallaro et al.* in sub-Saharan Africa [15] which are respectively 10.65%, 6.2% and varying from 5 to 10%. Several factors would justify the low rates of caesarean section such as: the underqualification of the personnel working at the level of the prenatal consultations [12, 16], the lack of access to this surgical act because the majority of qualified doctors live in urban areas and the Most hospitals have insufficient infrastructure for emergency surgical care [14, 15, 17]. This was not the case in our environment. Our frequency is much lower than those of many other African studies including those of *Lokomba et al.* in Kinshasa [18], of *Ouedraogo et al.* in Ouagadougou [19], of *Bokossa et al.* in Abidjan [20], of *Mbungu et al.* in Kinshasa [21] and of *Foumane et al.* in Yaoundé [13] which are respectively 28.50%, 30.30%, 31.03%, 31.20% and 19.70%. It should be noted that in sub-Saharan Africa, where the frequency of population caesareans was still very low, in recent years we have seen an increase in referral hospitals. In general, the frequency of caesarean sections is high in hospitals with a very high complexity score, in private maternities or those belonging to non-governmental organizations and in establishments

where there is a staff motivation system [22]. Which was not the case in our milieu. According to the WHO, the frequency of caesarean deliveries within a health care facility varies considerably depending on the composition of the obstetrical populations it serves, its capacities and resources, and its protocols for clinical care. Because of these differences, the recommended caesarean section rate at the population level cannot be considered the ideal rate at the hospital level [23]. According to the most recent estimates, caesarean sections should represent 18.6% of deliveries on average, with extremes of 6.0% to 27.2% respectively in the least and most developed regions [23]. Although our frequency is within this acceptable range, the need is not only the frequency figure for caesareans but also the improvement of the fetal prognosis while minimizing the maternal risk during caesarean sections. This was the case in our study setting.

The annual frequency of caesarean sections varied during the period of our study from 16.26% in 2014 to 16.41% in 2020 with a peak of 17.99% in 2018. This peak of our milieu could be explained by factors described in the literature such as: improvement general operating technique and anesthesia-resuscitation offering more security for the mother-child couple [10, 24], progress in neonatal resuscitation authorizing the extraction of hypotrophic and premature babies with a chance of survival without sequelae neurological [25], the improvement and, for some, the excessive use of electronic monitoring of parturition which would contribute to sometimes abusive caesarean sections [26, 27], the demographic changes that have occurred in developed countries which have reduced the number average number of children per family so that each child becomes more precious and the limitation of the number of births often imposed, rightly or wrongly, by caesarean section ceases to be bad accepted [12] and commercial and convenience motivations [14].

About two out of three caesarean sections were performed in a context of obstetric emergency from the outset, i.e. 65.0% of cases against 40.50%

performed after attempted vaginal delivery and 4.50% in a scheduled or elective manner. The place occupied by emergency caesareans in this study is also similar to that of other authors in our country and in other developing regions who report rates of emergency caesareans varying from 58 to 96% and evoke the various reasons, in particular: the absence of real prenatal consultations that can select and prophylactically guide high-risk pregnant women towards specialized structures, the resurgence of makeshift and invalid peripheral maternity wards, the underqualification of staff working in peripheral maternity wards, ignoring contraindications of the vaginal route and only referring pregnant women very late, the pronatalist ethnoculture that characterizes our populations, including most health professionals, devoting the vaginal route as the only happy motherhood, the cesarean section being wrongly deemed to limit births; poor distribution of health centers and difficulties in accessing referral structures; and last but not least, the poverty and illiteracy that characterize our populations. These are the common and characteristic factors of developing countries [11, 12, 14, 19, 20].

In the literature, there are multiple indications for caesarean sections and any obstetric pathology can be one [28]. In our case series, we have the following indications: hemorrhagic placenta previa, foeto-pelvic disproportion, dynamic dystocia complicated by acute fetal distress, uterine rupture, narrowed pelvis, beating cord prolapse, transverse presentation, malposition fetus and other indications. The increase in the indications for caesarean sections in the event of arterial hypertension responds to the recommendations of a consensus which states that a caesarean section is indicated if the hypertension is severe or unstable from the 34th week of amenorrhea. In fact, during this period, the fetus runs a greater risk of dying from hypertension than from prematurity [20]. In our case series, no caesarean section was indicated for hypertension. Regarding HIV infection, it is an indication for elective caesareans for most European authors because it reduces the risk of mother-to-child transmission [29]. In our

environment, we opt for vaginal delivery in the absence of obstetric contraindications. However, this vaginal delivery is done under an antiretroviral protocol and precautions must be taken during this delivery to protect the baby and the staff.

The weakness of our study is not to have studied the types of complications of caesarean section at the same time while its strength is to be the first to study the epidemiological particularity and indications of caesarean section in the hospitals of Kananga in the Central Kasai.

Conclusion

It clearly appeared in this study that the frequency of caesarean section was about one in six parturients delivered by caesarian section, primiparity was most affected, hemorrhagic placenta previa was most frequent indication, its complications presented about half of cases and the maternal mortality rate due to cesarean section was of 531 maternal deaths per 100.000 live births. Our results serve as the basis for in-depth studies on the indications and complications of caesarean section in order to reduce the risks associated with the practice of caesarean section in our environment.

What is known about this topic

- *The purpose of the cesarean section is to save the newborn and the mother in situations where the vital prognosis of the fetus and mother is endangered;*
- *The frequency of cesarean section has continued to increase in recent decades, but this increase differs enormously from one country to another and in the same environment, from one medical institution to another;*
- *The lack of data on the epidemiology and indications of caesarean section in hospitals of Kananga, in the DR Congo.*

What this study adds

- *The frequency of Cesarean section is about one in six parturients delivered by caesarian section;*
- *The average age of patients is of 25.39 years, the primiparaous is more concerned, haemorrhagic placenta previa is the most frequent indication, its complications are present in about half of cases, maternal mortality rate linked to caesarean section was of 531 maternal deaths per 100.000 live births;*
- *Our results are the basis of deepened studies upon intra operative complications of cesarean-section in order to reduce the risk linked to cesarean section's practice in our milieu.*

Competing interests

The authors declare no competing interests.

Authors' contributions

Conception and study design: ATK, SMK; data analysis and interpretation: ATK; manuscript revision: ATK; guarantor of the study: ATK. All authors read and approved the final version of the manuscript.

Acknowledgments

To medical staff of Saint Joseph Hospital (Dr Dieudonné ILUNGA) for having allowed us and facilitated us in collecting data for this study.

Tables and figure

Table 1: age and parity of patients who have had caesareans

Table 2: the indications and complications of caesarean section

Figure 1: frequency's evolution of caesarean-section during our study's period

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Table 1: age and parity of patients who have had caesareans

Age range	N=1395	%
16-20	433	31.02
21-25	375	26.86
26-30	209	15.00
31-35	140	10.00
36-40	153	11.00
41-45	85	6.10
Parity		
Primiparity	382	27.38
Pauciparity	347	24.87
Multiparity	363	26.02
Grand multiparity	303	21.72

Table 2: the indications and complications of caesarean section

Indications of caesarean-section	N=1395	%
Hemorrhagic placenta previa	375	26.86
Foeto-pelvic disproportion	192	13.85
Dynamic dystocia complicated by acute fetal distress	209	14.95
Uterine rupture	185	13.29
Narrowed pelvis	93	6.64
Flapping cord prolapse	100	7.17
Transversal presentation	97	6.92
Fetal malposition	97	6.92
Others	47	3.40
Maternal complications of caesarean section		
Present	610	46.73
Absent	785	56.27
Post-therapeutic evolution		
Maternal death	45	0.53103

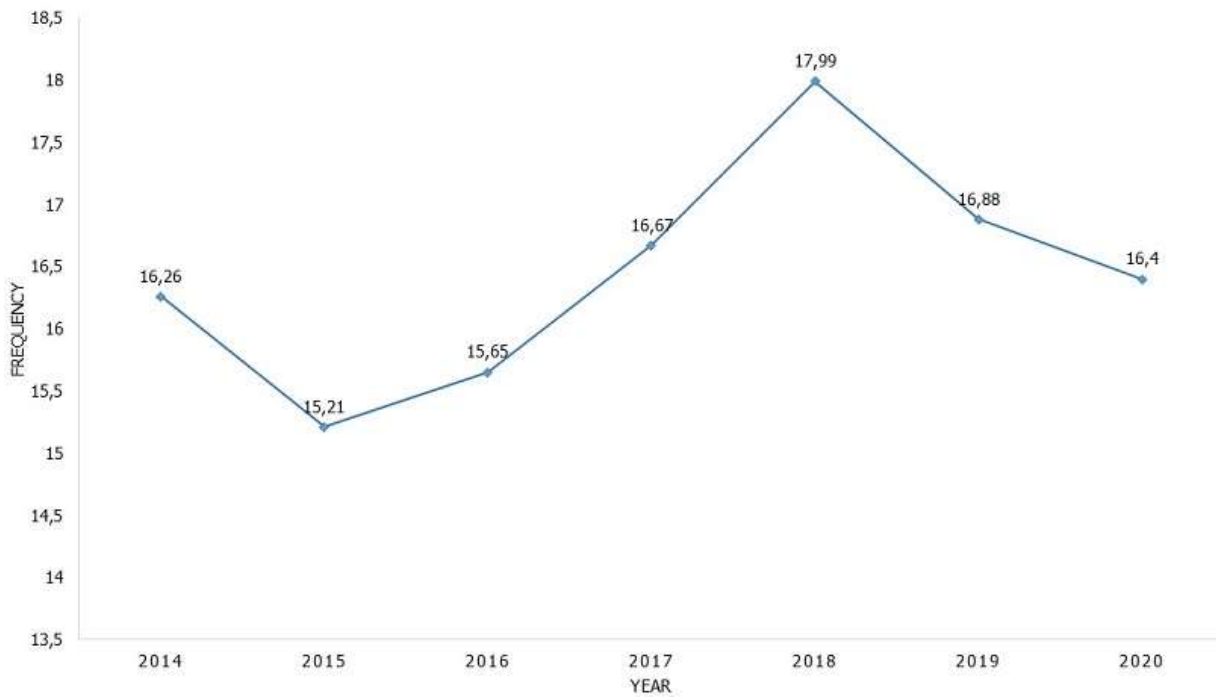


Figure 1: frequency's evolution of caesarean-section during our study's period