



## Research Article

# Caesarean Delivery as a Predictor of Inadequate Breastfeeding among a Group of Neonates in Yaoundé, Cameroon

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## Abstract

Though caesarean section has been recognized as an indispensable intervention to improve infants and mothers' outcomes in dystocic deliveries, recent research emphasizes the fact that it is associated with a lower rate of breastfeeding initiation. Whereas, suboptimal breastfeeding may be responsible for up to 11% deaths in children under 5 years. This study aimed at investigating beyond risk factors, the predictors of inadequate breastfeeding practices among which delivery by caesarean section, in a group of Cameroonian neonates. We conducted a cross-sectional analytic study over a period of six months from December 2018 to May 2019. We included all livebirth neonate infants weighing > 2000g and with no contraindication to breastfeeding. A total of 250 neonates were enrolled in the survey, the mean age of mothers was  $27.9 \pm 6.2$  years. Poor breastfeeding practices was found in 153 neonates (61.2%), though 208 mothers (83.2%) had a school education  $\geq$  secondary level. Seventy-eight (78) neonates were delivered through Caesarean section, with a rate of 31.2%. Among various risk factors identified, caesarean delivery appeared as a strong predictive factor for inadequate breastfeeding after multivariate analysis by logistic regression. From these results, we concluded more emphasis should be laid on improving antenatal follow-up and counselling of mothers to reduce the increasing rate of emergency caesarean deliveries and promote breastfeeding practices. More so, elective caesarean section by spinal anesthesia should be favored in case of necessity, thereby enabling timely and adequate breastfeeding after surgical delivery.

**Keywords:** Breastfeeding; Caesarean section; Cameroon

## Introduction

Adequate breastfeeding may be defined as the timely initiation of the act, its effectiveness in terms of the technique, exclusiveness, and necessary duration. In newly delivered women, the Early Initiation of Breastfeeding (EIBF) also referred to as timely breastfeeding, may be defined as the proportion of newly born infants who are breastfed within the first hour following delivery [1]. In effect, according to the WHO recommendations, breastfeeding should take place within 30 minutes to an hour at most, following childbirth [1,2]. A number of research studies have reported considerable delays in breastfeeding initiation among women with caesarean delivery, thereby contributing to poor breastfeeding practices in this subpopulation [3]. Whereas, the act of breastfeeding is thought to be reinforced in developing countries due to its cost-effectiveness and natural availability, making it accessible for the neonate at any time from its mother. Moreover, the WHO recommends exclusive breastfeeding during

the first six months of life, given that recent studies in developing countries such as Ethiopia, Ghana, Bolivia and Madagascar just as many others before, have revealed that breastfeeding could prevent as much as 20-22% neonatal and under 5 infant mortality [2-7]. However, the average time for the initiation of breastfeeding as well as the effectiveness of its technique, its exclusiveness and duration, seems to vary from one population to another and may be prolonged by caesarean delivery [2-7]. Continuously rising levels of caesarean section due to poor antenatal follow-up, suboptimal delivery practices, progressive psychological accommodation, acceptance and request may further worsen the situation [3,8]. The aim of our research study was to investigate beyond risk factors, the predictors of inadequate breastfeeding among which caesarean section, in a group of neonates in our context.

## Methodology

We conducted a cross-sectional analytical study with prospective data collection, over a six-month period from December 2018 to May 2019, at the Yaoundé Gynaeco-Obstetric

and Paediatric Hospital which is a University Teaching Hospital in Cameroon. We included all livebirth newborn infants weighing more than 2000g, with no contraindication to breastfeeding and who consented to participate in our study. The enrolled neonates and mothers were observed during the first week of postpartum to detect those that would practice adequate breastfeeding in terms of the time of initiation, the effectiveness, exclusiveness and duration in conformity with the WHO's recommendations. However, the duration of exclusive breastfeeding could only be evaluated after 6 months, and so we rather assessed the mother's intention to do so. We conducted simple, adapted, and oriented interviews using a pretested questionnaire, so as to improve investigations. Bivariate analysis made possible the identification of risk factors, and was followed by multivariate analysis to isolate predictive factors. The data were analyzed using CS Pro version 6.2 and SPSS version 20.0. Chi-square testing was used to identify statistical associations between variables. The P value < 0.05 was used to characterize statistical significance. The Odds ratio with 95% confidence interval was used to reveal risk factors.

Ethical clearances from the Institutional Ethics and Research Committee of the Faculty of Medicine and Biomedical sciences of the University of Yaoundé 1 and the Yaoundé Gynaeco-Obstetric and Paediatric Hospital were obtained before the beginning of the survey. The data collected was kept confidential and used for the purpose of the study only.

## Results

We enrolled 250 newborns and their mothers, the mean age was 27.9 ± 6.2 years. Seventy-eight neonates were delivered through caesarean section (31.2%), out of which 50 (64.1%) were emergency caesarean sections. Complication after caesarean delivery occurred in 7 women (8.9%) with postpartum hemorrhage in 4 women (57.1%) and sepsis in 3 women (42.9%). Poor breastfeeding practices was found in 153 neonates and mothers (61.2%), even though 208 women (83.2%) had a school education ≥ secondary level. Among all neonates with inadequate breastfeeding, 72 (47%) had been delivered through caesarean section. Likewise, 92.3% neonates delivered through caesarean section had inadequate breastfeeding, and this was mainly due to delayed initiation of the process. Close to 174 women (69.6%) had at least 02 living children, previously delivered by vaginal route and so were used to breastfeeding practice.

### Characteristics of inadequate breastfeeding

The various characteristics of inadequate breastfeeding practices among neonates and their mothers with caesarean delivery are summarized in table 1 below.

Variables	N (72)	Percentage (%)
Delayed initiation of breastfeeding > 60 minutes	70	97.2
Formula use or other breastmilk substitute	62	86.1
No intention for 6 months exclusive breastfeeding	58	80.5
Ineffective breastfeeding technique	45	62.5

**Table 1:** Characteristics of inadequate breastfeeding among neonates and mothers with caesarean delivery.

### Factors associated with inadequate breastfeeding practices

Primary education level of mothers, Centre region as sociocultural origin, Caesarean delivery, HIV infection, gestational age below 37 weeks of pregnancy, low birthweight and neonatal infection at birth were associated with inadequate breastfeeding after bivariate analysis. Logistic regression isolated the Centre region as sociocultural origin, and caesarean delivery as independent predictors of inadequate breastfeeding (Tables 2 and 3).

Variables	Breastfeeding practice		OR	p-Value
	Inadequate	Adequate		
Primary education	22 (78.6)	6 (21.4)	2.5	0.045
Centre region	60 (66.7)	30 (33.3)	2.4	0.002
HIV infection	16 (88.9)	2 (11.1)	5.5	0.012
<b>Caesarean section</b>	<b>72 (92.3)</b>	<b>6 (7.7)</b>	<b>13.5</b>	<b>&lt;0.001</b>
Gestational age < 37 weeks	18 (85.7)	3 (14.3)	4.2	0.016
Low birthweight <2500g	15 (83.3)	3 (16.7)	3.4	0.045
Neonatal infection	13 (92.9)	1 (7.1)	10.9	0.009

**Table 2:** Factors associated with inadequate breastfeeding.

Variables	Adjusted OR (CI à 95%)	Adjusted p-value
Primary school education level	2.3 (0.8 – 6.5)	0.110
Centre region	2.54 (1.8 – 4.5)	0.033
HIV Infection	4.5 (0.9 – 22.3)	0.062
<b>Caesarean section</b>	11.3 (4.6 – 27.7)	< 0.001
Gestational age < 37months	2.3 (0.5 – 10.4)	0.267
Low birthweight < 2500g	1.2 (0.2 – 5.8)	0.847
Neonatal infection	6.6 (0.8 – 56.9)	0.088

**Table 3:** Predictors of inadequate breastfeeding after multivariate analysis.

## Discussion

The assessment of breastfeeding practices was based on four characteristics including timely initiation, the use of breastmilk substitute, the effectiveness of the breastfeeding technique and the duration. Among the various characteristics, the delay of breastfeeding initiation was the most contributive, occurring in more than 97% of neonates and mothers with caesarean delivery with poor breastfeeding practices. This induced the use of formula milk or other substitutes in over 86%, and more than 80% not having the intention to do exclusive breastfeeding over 6 months. The rate of early breastfeeding initiation after caesarean delivery was therefore as low as 2.8 % in this survey, which is in conformity with predictions from the literature [3,8-10]. While the effectiveness of the act of breastfeeding was defined by deep, tonic and slow suction separated or not by short pauses and yielding breastmilk into the baby’s mouth, duration was assessed in terms of intention to breastfeed exclusively during the first six months. This was due to the difficulty to follow all women over a six-month period. As a matter of facts, a number of research works have revealed associations between breastfeeding initiation and exclusive breastfeeding [3,11]. There is evidence that mothers with caesarean delivery are likely to feed their infants with formula milk in the first 3 days following childbirth, and are as well less susceptible to breastfeed exclusively during the first six months [3,11]. Therefore, high rates of delayed breastfeeding initiation may be responsible for differences in breastfeeding rates between babies born through cesarean section and those born by vaginal delivery [3]. This effect may be amplified by the rising preference for caesarean delivery in women. Likewise, low rates of early breastfeeding initiation may be responsible for reduced exclusive breastfeeding.

In this survey, caesarean section appeared as the main cause of maternal indispositions to breastfeeding. This was mainly due to mother-infant separation immediately after the intervention, post-surgical pains, hemodynamic instability, initial agalactorrhea or hypogalactorrhea, emotional and mood disorders [12]. Indeed, caesarean section is a well-known documented determinant for delayed breastfeeding initiation, already described by a number of researchers in various contexts [13-15]. It was even more strongly associated to inadequate breastfeeding in this study, occurring as an independent predictive factor. There are some pertinent hypotheses according to which women delivering through caesarean section may have less endocrinal and psychological preparedness to breastfeeding [16]. The reinforcement of maternal education and counselling, as well as special training sessions on breastfeeding after caesarean delivery for the medical staff, should be considered in order to promote early breastfeeding initiation and adequate breastfeeding in such women.

There are various hormone variations after caesarean section including the drop of endorphin, prolactin, and oxytocin blood levels, which have been incriminated for reducing galactorrhea and breastfeeding desire in the immediate post-operative period [3]. While a drop of prolactin hormone synthesis from the anterior pituitary gland is responsible for reduced breastmilk production from alveolar cells of the breast acini, a drop in oxytocin release from the hypothalamus through the posterior pituitary gland into the blood, causes reduced stimulation of perialveolar and ductal myoepithelial cells, and so diminishes milk ejection. On the other hand, endorphin enhancement of positive emotional and affective interaction in the mother, which is generally associated with the desire and the satisfaction in breastfeeding is reduced as well [3,17-20]. Therefore, there may exist an inclination to agalactorrhea, hypogalactorrhea and reduced lactation after caesarean section, which contrasts with the normal expected hormonal changes after vaginal delivery to favor breastfeeding. In theory, lactation is thought to be higher after emergency caesarean section, as labor would have induced higher oxytocin and prolactin secretion in the mother [3]. However, a newborn which has gone through labor and delivered by vaginal route is thought to have more appetite and improved suckling reflexes [21]. The improvement of antenatal care involving early diagnoses and management of some pregnancy-related disorders would considerably reduce the increasing rate of caesarean section, with favorable repercussions on breastfeeding [3]. In such a context, most caesarean sections would be elective with regional anesthesia which has less impact on the breastfeeding process. Husband’s presence may be allowed in the theatre during the intervention as well, as advocated by some studies which showed positive effects with anxiety relief and better lactation [3].

Caesarean section is generally associated with considerable maternal sedation, pain, post-operative complications such as hemorrhage, infection, and post-traumatic stress, which may further render breastfeeding undesirable [17-20,22]. After caesarean section, especially when practiced with general anesthesia, mother and baby are generally separated for a while, to enable the mother's continuous monitoring and awakening [22]. Furthermore, opioid pain killers administered to mothers post-operatively may induce sleep in the baby preventing it from feeding regularly and reducing the suckling tonus. The avoidance of mother-infant separation may be achieved by designing hospital services such that the delivery room, the theatre, the recovery room and the neonatology unit should not be far separated from each other [3]. Better still, mother and newborn skin-to-skin contact immediately after cesarean delivery should be enabled right from the theatre. Recovery rooms should be provided with cradles and incubators to keep the baby near its mother thus favoring the early initiation of breastfeeding. The necessary staff for mother and baby care should be allocated, with special emphasis on nursing support [3]. Side-lying and clutch positions are recommended as comfortable postures for breastfeeding after caesarean section. More so, placing the baby on properly positioned pillows relieve pressure and pain from the incision site [23].

From an epidemiological stand point, the admitted rate of caesarean section which is 15% deliveries, may consequently induce a risk for inadequate breastfeeding in almost 15% neonates if no appropriate intervention is put in place to support and improve breastfeeding practices [20,22]. This tendency should seriously be considered, as the rate of caesarean delivery continuously rises with time, especially among urban communities. Moreover, it has been shown that once the rate of caesarean section exceeds 15%, adverse maternal and neonatal outcomes become more prevalent [3]. Therefore, caesarean delivery should not be a hindrance for breastfeeding, especially in a context of limited financial resources, where it may have considerable economic value in addition to its medical importance. As a matter of fact, rigorous vigilance for timely initiation of breastfeeding after caesarean delivery is recommended [21-23].

## Conclusion

The rate of caesarean section seems to be continuously rising in developing countries, especially among urban communities such as in Yaoundé, where there is increasing emergency obstetrical care. From this survey, it appeared that caesarean section was a predictive factor for inadequate breastfeeding in mothers, giving way to the use of substitutes including formula milk. Therefore, more emphasis should be laid on the improvement of antenatal follow-up in order to reduce the rate of emergency caesarean section. Maternal education, medical staff training on breastfeeding and post-operative delivery care, should be reinforced as well, in a

bid to improve breastfeeding practice.

## Author Contributions

Authors participated in all steps of the study.

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## Conflict of Interest

The authors declare that they have no competing interest

## References

1. Victora C, Sankar M, Rollins N, Murch S, Krusevec J, et al. (2016) Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. *Lancet*. 387: 475-490.
2. WHO (2000) Effect of breastfeeding on infant and child mortality due to infectious diseases in less developed countries: a pooled analysis. WHO collaborative study team on the role of breastfeeding on the prevention of infant mortality. *Lancet*. 355: 451-455.
3. Kuyper E, Vitta B, Dewey K (2014) Implications of cesarean delivery for breastfeeding outcomes and strategies to support breastfeeding. *Alive Thrive Tech Brief*. 8: 1-9.
4. Mullany L, Katz J, Li Y, Khatri S, LeClerq S, et al. (2008) Breast-feeding patterns, time to initiation, and mortality risk among newborns in southern Nepal. *J Nutr*. 138: 599-603.
5. Baker E, Sanei L, Franklin N (2006) Early initiation of and exclusive breastfeeding in large-scale community-based programmes in Bolivia and Madagascar. *J Health Popul Nutr* 24: 530-539.
6. Edmond K, Zandoh C, Quigley M, Amenga-Etego S, Owusu-Agyei S, et al. (2006) Delayed breastfeeding initiation increases risk of neonatal mortality. *Pediatrics* 117: 380-386.
7. Setegn T, Gerbaba M, Belachew T (2011) Determinants of timely initiation of breastfeeding among mothers in Goba Woreda, South East Ethiopia: A cross sectional study. *BMC Public Health* 11: 217.
8. Odent M (2005) *Césariennes: questions, effets, enjeux. Alerte face à la banalisation*. Le Souffle d'Or. Barret-sur-Méouge: Elsevier Masson; 2005.
9. Bimerew A, Teshome M, Kassa G (2016) Prevalence of timely breastfeeding initiation and associated factors in Dembecha district, North West Ethiopia: a cross-sectional study. *Int Breastfeed J*. 11: 28.
10. Constance A, Gewa M, Monica O, Lauren S (2011) Determinants of Early Child-Feeding Practices Among HIV-Infected and Non infected Mothers in Rural Kenya. *J Hum Lact*. 27: 239-249.
11. Prior E, Santhakumaran S, Gale C, Philipps LH, Modi N, et al. (2012) Breastfeeding after cesarean delivery: a systematic review and meta-analysis of world literature. *American Journal of Clinical Nutrition*. 95: 1113-1135.
12. The American College of Obstetricians and Gynecologists (2013) *Cesarean Delivery on Maternal Request*. Committee Opinion. 559: 4.

13. Bosi A, Eriksen K, Sobko T, Wijnhoven T, Breda J (2016) Breastfeeding practices and policies in WHO European region member states. *Public Health Nutr*. 19: 753-764.
14. World Health Organization (2007) *HIV and Infant Feeding: New Evidence and Programmatic Experience*. Geneva, Switzerland.
15. Odent M (2005) *Césariennes: questions, effets, enjeux. Alerte face à la banalisation*. Le Souffle d'Or. Barret-sur-Méouge: Elsevier Masson; 2005. 200 p.
16. Prior E, Santhakumaran S, Gale C, Philipps LH, Modi N, et al. (2012) Breastfeeding after cesarean delivery: a systematic review and meta-analysis of world literature. *American Journal of Clinical Nutrition*. 95: 1113-1135.
17. Bosi A, Eriksen K, Sobko T, Wijnhoven T, Breda J (2016) Breastfeeding practices and policies in WHO European region member states. *Public Health Nutr*. 19: 753-764.
18. World Health Organization (2007) *HIV and Infant Feeding: New Evidence and Programmatic Experience*. Geneva, Switzerland: World Health Organization.
19. Arifeen S, Black R, Antelman G, Baqui A, Caulfield L, et al. (2001) Exclusive breastfeeding reduces acute respiratory infection and diarrhea deaths among infants in Dhaka slums. *Pediatrics*. 108: 67.
20. Coovadia H, Rollins N, Bland R (2007) Mother-to-child transmission of HIV-1 infection during exclusive breastfeeding in the first 6 months of life: an intervention cohort study. *Lancet*. 369: 1107-1116.
21. Hyde MJ, Mostyn A, Modi N, Kemp PR (2012) The health implications of birth by Caesarean section. *Biological Reviews of the Cambridge Philosophical Society*. 87: 229-243.
22. MaJra J, ViJay K (2016) Barriers to Early Initiation and Continuation of Breastfeeding in a Tertiary care Institute of Haryana: A Qualitative Study in Nursing Care Providers. *J of Clin and Diagn Res*. 10: 16-20.
23. La Leche League International (2013) Is it possible to breastfeed after a cesarean birth?