
Association between the mode of delivery and breastfeeding

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Abstract

Background: The rising rate of cesarean section is noticed all over the world. Cesarean delivery is associated with multiple adverse effects. Its association with successful breastfeeding has been questioned.

Objective: To evaluate the association between breastfeeding and the mode of delivery.

Study design: This was a cross-sectional study conducted from January 2021 to December 2021 at a tertiary hospital's obstetrics and gynecology department. We recruited women with a firstborn child aged 18- 45 years and had their delivery 1.5 to 2 years ago. Data were obtained about age, weight, height, occupation, level of education, duration of exclusive breastfeeding, total duration of breastfeeding, and need for supplementary formula. Data about the mode of delivery - vaginal, elective CS, CS after labor pains- were also obtained.

Results: There were 21, 49, and 19 women in the vaginal delivery, elective CS, and emergency CS groups, respectively. The mean age of the studied population was 25.51 ± 3.6 . The duration of breastfeeding was prolonged with vaginal delivery (13.6 ± 7.1 months) yet, statistically insignificant (p-value 0.412). Exclusive breastfeeding was maintained with vaginal delivery (80.9%) followed by elective CS delivery (71.4%), but the difference was insignificant (p-value 0.455). Lower body mass index predicted successful breastfeeding significantly (p-value 0.021).

Conclusion: There was no difference between the mode of delivery and successful breastfeeding. The body mass index was a significant predictor for exclusive breastfeeding.

Key words: breastfeeding; cesarean section; vaginal delivery.

Introduction

Breastfeeding is beneficial to the mother and the baby; however, the rate of exclusive breastfeeding is declining (1, 2). The mode of delivery influences breastfeeding adversely, particularly cesarean delivery. The mode of delivery is decided by the combined opinions of the obstetricians and the parturient herself (3). The

association between breastfeeding and the mode of delivery is not well established, with data documenting no association (4, 5) while others reported negative association (6). With the rising rates of cesarean deliveries, far from the recommended rates by the WHO (7), it is crucial to understand the relationship between breastfeeding and the mode of delivery. This would be helpful while counseling women requesting elective cesarean delivery. This study aimed to explore the association between the mode of delivery and breastfeeding in nulliparous women.

Methods

This was a cross-sectional study conducted from January 2021 to December 2021 at the obstetrics and gynecology department of a tertiary hospital. The study was conducted after the approval of the research ethics committee. Written informed consent was obtained from all participants before enrollment in the study.

We recruited women according to inclusion and exclusion criteria as follows:

- **Inclusion criteria:** a) age range from 18- 45 years, b) primiparous women, c) delivery from 1.5 to 2 years ago, and d) women delivering vaginally, elective cesarean section (CS), and CS after labor pains.
- **Exclusion criteria:** a) women who refused to participate in the study, b) women who refused to breastfeed their infants, c) history of chronic illness, d) history of a breast mass or surgery requiring cessation of breastfeeding, e) smoking, and f) complications after delivery –PPH, puerperal infection, prolonged hospital admission, and tears or infected wounds.

Eligible women were interviewed, and data were obtained about age, weight, height, occupation, level of education, duration of

exclusive breastfeeding, total duration of breastfeeding, and need for supplementary formula. Data about the mode of delivery – vaginal, elective CS, CS after labor pains– were obtained. We recruited eligible women over one year.

Ethical approval: This study was conducted after approval of the research ethics committee of faculty of medicine, Suez Canal University, in 28/12/2020 with an approval number of 4397#.

Results

One hundred and one women were eligible for the study. Twelve women refused to participate in the study leaving 89 women participating in the study. There were 21, 49, and 19 women in the vaginal delivery, elective CS, and emergency CS groups. The mean age of the studied population was 25.51 ± 3.6 , with younger women having vaginal delivery than their peers. The majority of CS was among housewives and highly educated women (75.5% and 81.6 %, respectively) (Table 1).

The duration of breastfeeding was prolonged with vaginal delivery (13.6 ± 7.1 months) however; the difference was insignificant (p-value 0.412). Exclusive breastfeeding was maintained with vaginal delivery (80.9%) followed by elective CS delivery (71.4%), yet the difference was insignificant (p-value 0.455) (Table 2).

Logistic regression analysis revealed that lower BMI was a significant predictor for successful breastfeeding (p value 0.012) (Table 3).

Discussion

Cesarean delivery rates were increased among women of advanced ages, highly educated women, and housewives. This agreed with the results of a previous study in which CS was increased among older women and high school graduates (3, 8). It has been

reported that CS rates increase with age and family income. This would be explained by preferring birth in private hospitals with higher CS rates than governmental ones (9). However, there is a discrepancy in CS rates, which may be related to cultural and social factors that affect women's decisions regarding the mode of delivery (3).

The duration of breastfeeding and exclusive breastfeeding was prolonged with vaginal delivery, although insignificant. This agreed with the results reported in a previous study where no association was found between the duration of breastfeeding and exclusive breastfeeding between women delivered vaginally or by CS (3). In the meantime, previous studies reported that exclusive breastfeeding was significantly lower among women delivered by CS (10, 11, and 12). Additionally, vaginal delivery failed to predicted successful breastfeeding. This was in agreement with the results reported by Kiani et al., where breastfeeding did not differ according to the mode of delivery (13). However, another study reported that CS was associated with breastfeeding for one month (14). Also, women who delivered by VBAC had successful breastfeeding than those delivered by repeated CS (15).

Additionally, higher education was associated with breastfeeding for less than one month. This was documented in the current study as well. This was rendered to maternal awareness of the benefits of breastfeeding and the ability to decide to breastfeed. Those women would be employed in a full-time job which hinders breastfeeding (14). This would be explained by the negative maternal feelings associated with CS as a surgical intervention precluding the duration of breastfeeding (14). Successful breastfeeding is affected by the delay in skin-to-skin contact between the mother and the neonate, as the neonate is transferred to a nursing unit allowing the mother to rest and recover after delivery (10). Also, there might be antepartum or intrapartum fetal complications that lead to

delayed breastfeeding (3). This would lead to early interruption of breastfeeding before six weeks of delivery (16).

Additionally, the increased rates of CS above the recommended rates by the WHO contribute significantly to failed breastfeeding (10). Prescription of post-cesarean delivery antibiotics is a routine practice in our country. Women may delay breastfeeding initiation for fear of transmission of the antibiotic to their infants (17). The amount of breast milk is scarce in the first five days after cesarean delivery contributing to an additional obstacle for breastfeeding initiation (18).

Lower BMI was a significant predictor of successful breastfeeding. This was in accordance with a previous systematic review where obese women were less able to initiate breastfeeding or to maintain exclusive breastfeeding for a long period (19). Failure to initiate breastfeeding was explained by the storage of progesterone in fat cells which affects the production of lactogenesis II (20). Also, obese women have large breasts which might impact the ability of the neonate to suckle adequately (21). As obesity might be associated with other comorbidities, this would impact successful breastfeeding (22). In addition, obese women had lower confidence in their ability to provide adequate milk, less satisfaction towards body image, and lack of intention towards prolonged breastfeeding (23, 24).

Strength and limitations

This study recruited a small number of primiparous women. This was within two years of delivery to avoid recall bias. Few women were still breastfeeding their infants, contributing a little to the proper estimation of breastfeeding duration. Not all of them had their delivery in the institute, causing a lack of information about elective or emergency CS practiced in private hospitals, which might affect the mothers' decision regarding breastfeeding.

Conclusion

There was no difference between the mode of delivery and successful breastfeeding. The body mass index was a significant predictor for exclusive breastfeeding.

Conflict of interest: None.

References

1. Kramer MS, Aboud F, Mironova E, Vanilovich I, Platt RW, Matush L, Igumnov S, Fombonne E, Bogdanovich N, Ducruet T, Collet JP. Breastfeeding and child cognitive development: new evidence from a large randomized trial. *Archives of general psychiatry*. 2008;65(5):578-84.
2. Victora CG, Bahl R, Barros AJ, França GV, Horton S, Krasevec J, Murch S, Sankar MJ, Walker N, Rollins NC, Group TL. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. *The lancet*. 2016;387(10017):475-90.
3. de Arruda GT, Barreto SC, Morin VL, do Nascimento Petter G, Braz MM, Pivetta HM. Is there a relation between mode of delivery and breastfeeding in the first hour of life?. *Revista Brasileira em Promoção da Saúde*. 2018;31(2):1-7.
4. Hauck YL, Fenwick J, Dhaliwal SS, Butt J. A Western Australian survey of breastfeeding initiation, prevalence and early cessation patterns. *Maternal and child health journal*. 2011;15(2):260-8.
5. Kohlhuber M, Rebhan B, Schwegler U, Koletzko B, Fromme H. Breastfeeding rates and duration in Germany: a Bavarian cohort study. *British Journal of Nutrition*. 2008;99(5):1127-32.
6. Ogunlesi TA. Maternal socio-demographic factors influencing the initiation and exclusivity of breastfeeding in a Nigerian semi-urban setting. *Maternal and child health journal*. 2010;14(3):459-65.
7. Moore B. Appropriate technology for birth. *The Lancet*. 1985;326(8458):787.
8. Betrán AP, Ye J, Moller AB, Zhang J, Gülmezoglu AM, Torloni MR. The increasing trend in caesarean section rates: global, regional and national estimates: 1990-2014. *PloS one*. 2016;11(2):e0148343.
9. Xie RH, Gaudet L, Krewski D, Graham ID, Walker MC, Wen SW. Higher cesarean delivery rates are associated with higher infant mortality rates in industrialized countries. *Birth*. 2015;42(1):62-9.
10. Ahmed KY, Page A, Arora A, Ogbo FA. Trends and determinants of early initiation of breastfeeding and exclusive breastfeeding in Ethiopia from 2000 to 2016. *International breastfeeding journal*. 2019;14(1):1-4.
11. Prior E, Santhakumaran S, Gale C, Philipps LH, Modi N, Hyde MJ. Breastfeeding after cesarean delivery: a systematic review and meta-analysis of world literature. *The American journal of clinical nutrition*. 2012;95(5):1113-35.
12. Hoang Nguyen PT, Binns CW, Vo Van Ha A, Nguyen CL, Khac Chu T, Duong DV, Do DV, Lee AH. Caesarean delivery associated with adverse breastfeeding practices: a prospective cohort study. *Journal of Obstetrics and Gynaecology*. 2020;40(5):644-8.
13. Kiani SN, Rich KM, Herkert D, Safon C, Pérez-Escamilla R. Delivery mode and breastfeeding outcomes among new mothers in Nicaragua. *Maternal & child nutrition*. 2018;14(1):e12474.
14. Leung GM, Lam TH, Ho LM. Breastfeeding and its relation to smoking and mode of delivery. *Obstetrics & Gynecology*. 2002;99(5):785-94.
15. Regan J, Thompson A, DeFranco E. The influence of mode of delivery on breastfeeding initiation in women with a prior cesarean delivery: a population-

- based study. *Breastfeeding Medicine*. 2013;8(2):181-6.
16. DiGirolamo AM, Grummer-Strawn LM, Fein S. Maternity care practices: implications for breastfeeding. *Birth*. 2001;28(2):94-100.
 17. Duong DV, Binns CW, Lee AH. Breast-feeding initiation and exclusive breast-feeding in rural Vietnam. *Public Health Nutrition*. 2004;7(6):795-9.
 18. Cohen SS, Alexander DD, Krebs NF, Young BE, Cabana MD, Erdmann P, Hays NP, Bezold CP, Levin-Sparenberg E, Turini M, Saavedra JM. Factors associated with breastfeeding initiation and continuation: a meta-analysis. *The Journal of pediatrics*. 2018; 203:190-6.
 19. Huang Y, Ouyang YQ, Redding SR. Maternal prepregnancy body mass index, gestational weight gain, and cessation of breastfeeding: a systematic review and meta-analysis. *Breastfeeding Medicine*. 2019;14(6):366-74.
 20. Hilson JA, Rasmussen KM, Kjolhede CL. Excessive weight gain during pregnancy is associated with earlier termination of breast-feeding among white women. *The Journal of nutrition*. 2006;136(1):140-6.
 21. Gubler T, Krähenmann F, Roos M, Zimmermann R, Ochsenbein-Kölble N. Determinants of successful breastfeeding initiation in healthy term singletons: a Swiss university hospital observational study. *Journal of Perinatal Medicine*. 2013;41(3):331-9.
 22. Rahman MM, Abe SK, Kanda M, Narita S, Rahman MS, Bilano V, Ota E, Gilmour S, Shibuya K. Maternal body mass index and risk of birth and maternal health outcomes in low and middle income countries: a systematic review and meta analysis. *Obesity reviews*. 2015;16(9):758-70.
 23. Keely A, Lawton J, Swanson V, Denison FC. Barriers to breast-feeding in obese women: A qualitative exploration. *Midwifery*. 2015;31(5):532-9.
 24. Turcksin R, Bel S, Galjaard S, Devlieger R. Maternal obesity and breastfeeding intention, initiation, intensity and duration: a systematic review. *Maternal & child nutrition*. 2014;10(2):166-83.

Table 1: Patient demographic data

Variables	Variables	Mode of delivery			P value
		Vaginal delivery (21)	Elective CS (49)	Emergency CS (19)	
Occupation N (%)	House wife	17 (80.9%)	37 (75.5%)	17 (89.5%)	0.432
	Working	4 (19%)	12 (24.5%)	2 (10.5%)	
Education N (%)	None	5 (23.8%)	0 (0%)	1(5.3%)	0.008
	Middle	2 (9.5%)	9 (18.4%)	4 (21.1%)	
	High	14 (66.7%)	40 (81.6%)	14 (73.6%)	
Age (Years) (Mean \pm SD)		24.3 \pm 3.8	25.9 \pm 3.9	26.4 \pm 3.3	0.196
BMI		26.4 \pm 5.2	27.1 \pm 4.7	25.1 \pm 3.2	0.300

Table 2: Duration of breastfeeding among the studied population

Variable	Vaginal delivery (21)	Elective CS (49)	Emergency CS (19)	P value
Duration in months (mean \pm SD)	13.6 \pm 7.1	10.9 \pm 7.5	11.8 \pm 9.0	0.412
Exclusive breastfeeding N (%)	17 (80.9%)	35 (71.4%)	12 (63.2%)	0.455
Need for supplementation	6 (28.6%)	15 (30.6%)	7 (36.8%)	0.838

Table 3: Logistic regression analysis for the predictors of successful breastfeeding

Parameter	β	P value	95% CI
Housewife	-0.319	0.595	0.224- 2.358
None educated	1.718	0.114	-0.151- 0.180
Middle education	-1.941	0.071	0.017- 1.184
Vaginal delivery	-1.639	0.069	0.033- 1.133
Elective CS	-0.391	0.522	0.358- 0.980
Age	0.011	0.419	0.204- 2.239
BMI	-0.027	0.012	-0.048- -0.006