Effects of Breastfeeding on IUD Performance

LYNDA PAINTER COLE, MA, MARGARET F. MCCANN, MS,
JAMES E. HIGGINS, PHD, AND CYNTHIA S. WASZAK, MA

Abstract: The effect that lactation might have on intrauterine device (IUD) performance was investigated by using data from a series of multicenter clinical trials. Life-table methods were applied to compare breastfeeding and non-breastfeeding women with respect to IUD expulsion, accidental pregnancy, IUD removal for various reasons, and overall continuation of IUD use. Results indicate that breastfeeding does not increase the risk of expulsion or other events, whether the device is inserted immediately (within ten minutes) or more than 42 days after delivery. (*Am J Public Health* 1983; 73:384–388.)

Introduction

Many breastfeeding women want to avoid another pregnancy soon after delivery, but the contraceptive protection provided by breastfeeding itself is not predictable.[1] It is, therefore, important to consider which modern contraceptives are appropriate for breastfeeding women. There are two ways of looking at the interrelationship between breastfeeding and contraceptive use: the effect of the contraceptive on lactation, and the effect of lactation on the performance of the contraceptive.

Very few studies have looked at breastfeeding and intrauterine device (IUD) use, and most of them have examined only the effect of IUDs on lactation. They have generally found little effect of IUD use on the quantity of breast milk, duration of breastfeeding, or infant weight gain,[2–6] although some studies found that women using IUDs breastfed longer than users of other methods and non-contraceptors.‡,[7,8] The composition of breast milk does not appear to be influenced by IUD use.[3,5]

Only one previous study has been reported on the effect of breastfeeding on IUD use. In an earlier analysis of data from the International Fertility Research Program, Chi, *et al,* found higher 12-month IUD discontinuation rates for women who were breastfeeding at the time of IUD insertion (≥ 42 days postpartum) than for non-breastfeeding women.[9] The effect of breastfeeding status on discontinuation was studied for the Copper T and the Copper 7 IUDs using an interval standardization method[10] to adjust for parity difference. Pregnancy rates and bleeding/pain removal rates did not differ statistically by breastfeeding status at IUD insertion for either Copper T or Copper 7 IUD users. However, among women using the Copper T, the expulsion rate for breastfeeding women was higher than for non-breastfeeding women and had a p-value < 0.05.

Suckling leads to the release of oxytocin, which stimulates expulsion of milk from the breast and also produces uterine contractions. Because uterine contractions are stronger and more frequent in breastfeeding women, uterine involution after delivery is believed to be faster. For postpartum IUD insertions, the more rapid uterine involution of breastfeeders could presumably cause either higher expulsion rates (if the IUDs were pushed out) or lower expulsion rates (if the IUDs were held in). Conversely, for devices inserted later, after uterine involution is complete, continued uterine stimulation by suckling-induced oxytocin release may increase the risk of expulsion. Finally, it should be noted that recent research casts doubt on the predictability, magnitude, and importance for milk flow of oxytocin release in response to suckling,[11] a response that has been widely believed to exist. Considerably more research concerning the physiology of lactation is clearly required in order to determine how best to meet the contraceptive needs of breastfeeding women.

This paper focuses on the effect that lactation might have on IUD performance, comparing breastfeeding and non-breastfeeding women with respect to pregnancy, IUD expulsion, and IUD removal for various reasons.

‡Osteria TS: The effects of contraception upon lactation: analysis of urban data, (1976) 18 (Unpublished).

From the International Fertility Research Program (IFRP), Research Triangle Park, NC. Address reprint requests to Information Coordinator, IFRP, Research Triangle Park, NC 27709. Ms. Cole is Project Leader; Ms. McCann (currently a doctoral student at University of North Carolina) is former Research Associate; Dr. Higgins is Research Associate; and Ms. Waszak is Project Assistant; all with IFRP. This paper, submitted to the Journal April 1, 1982, was revised and accepted for publication September 10, 1982.
Editor's Note: See also related editorial p 364 this issue.

TABLE 1—Selected Characteristics of Fully Breastfeeding and Non-breastfeeding Women by Time of Insertion and Type of IUD

Time of Insertion	Lippes Loop D Breastfeeding Status		Copper T Breastfeeding Status		Delta Loop Breastfeeding Status		Delta T Breastfeeding Status	
	None	Full	None	Full	None	Full	None	Full
Interval[a]	N = 98	N = 173	N = 52	N = 109				
Age								
Median	25.9	25.8	25.6	23.4				
Range	16–42	16–40	16–42	16–38				
Live births								
Median	2.7	2.5	1.8	2.3				
Range	1–13	1–10	1–7	1–10				
Postpartum[b]			N = 146	N = 118	N = 442	N = 622	N = 229	N = 282
Age								
Median			26.1	26.6	26.2	25.5	24.9	24.74
Range			17–43	19–44	15–42	15–44	14–38	13–44
Live births								
Median			1.6*	1.5	2.2	2.3	1.7	2.0
Range			1–7	1–8	1–11	1–12	1–17	1–10

[a]6 weeks—6 months postpartum.
[b]Within 10 minutes of placental expulsion.
*The number of live births was missing for one non-breastfeeding woman.

Materials and Methods

Data are analyzed from a series of multicenter clinical trials designed by the International Fertility Research Program* to evaluate the safety and effectiveness of selected IUDs. The trial protocols generally required that women be followed-up for six months, although a few of the trials had 12-month follow-up. Included are 2,271 women whose IUDs were inserted from May 1976 through May 1981. Information on selected sociodemographic characteristics of the women, medical aspects of the IUD insertions, and complications and other events occurring after insertion was recorded on standard data collection forms.

Included in this analysis are the Lippes Loop D, the Copper T, and the postpartum modifications of both these devices (Delta Loop and Delta T, respectively). These devices were modified for postpartum insertion by adding projections of chromic sutures, which help the device remain in the uterus; the sutures biodegrade in six weeks, leaving a standard device in place.[12,13] Data are analyzed separately for IUDs inserted in the interval period (42 days to six months since last live birth) and immediately postpartum (within 10 minutes of placental expulsion).

Breastfeeding status was determined at the time of IUD insertions for women receiving interval insertions and at the first follow-up visit (approximately one month) for women whose devices were inserted immediately postpartum. The women were asked to classify their breastfeeding status as none, partial (with supplemention), and full (with no supplementation). Because partial breastfeeding includes such a broad range of breastfeeding behavior, only non-breastfeeding and fully breastfeeding women are compared. Since the trials from which we took the data were not designed to investigate lactation and IUD performance, individual studies were not necessarily balanced between non-breastfeeding and fully breastfeeding women. Our analysis was limited to women from studies where the smaller of the lactation classification proportions was at least 0.25.

Actuarial life-table methods were used to calculate cumulative rates for pregnancy, for expulsion, and for removal because of bleeding/pain, other medical reasons, planned pregnancy, personal reasons, and overall continuation. Where the frequency of events was sufficient, the data were further stratified in turn by age (<30, 30+) and number of live births (1, 2+). Three-month event and continuation rates are displayed but not compared statistically. Instead, pairs of survival distributions were compared for the first six months after IUD insertions by using Gehan's generalized Wilcoxin test.[14,15] The primary null hypothesis tested was that of no difference between the six-month expulsion rate curve of non-lactating and fully-lactating women. This hypothesis was tested at the $\alpha = 0.05$ level. Secondarily, we were interested in comparing other selected six-month event rate curves as well as overall continuation. For these multiple comparisons, the Bonferroni inequality was applied to assure that the family level of significance would be no more than $\alpha = 0.05$.

Results

Table 1 displays the median and range of age and number of live births for fully breastfeeding and non-breastfeeding women, by time of insertion and type of IUD. The groups are generally similar with regard to these two characteristics.

*The IFRP is a research organization that conducts clinical trials of new contraceptive methods ready for Phase III field testing. A network of investigators from 35 countries throughout Asia, Latin America, the Middle East, and Africa participate in various trials.

TABLE 2—Event and Continuation Rates for Fully Breastfeeding and Non-breastfeeding Women by Time of Insertion and Type of IUD

3-Month Event and Continuation Rates	Interval Insertions[a]				Immediate PP Insertions[b]					
	Lippes Loop D Breastfeeding Status		Copper T Breastfeeding Status		Copper T Breastfeeding Status		Delta Loop Breastfeeding Status		Delta Copper T Breastfeeding Status	
	None (N = 98)	Full (N = 173)	None (N = 52)	Full (N = 109)	None (N = 146)	Full (N = 118)	None (N = 442)	Full (N = 622)	None (N = 229)	Full (N = 282)
Expulsion	3.2	3.4	2.6	2.1	7.3	10.9	15.9	10.8	8.8	10.2
Pregnancy	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Bleeding/pain Removal	5.4	0.6	4.3	0.0	0.7	2.3	1.3	0.6	2.7	1.2
Removal for Other Medical Reasons	0.0	0.0	0.0	0.0	0.0	1.1	0.3	0.0	0.0	0.5
Removal for Planned Pregnancy	0.0	0.0	0.0	0.0	0.0	1.1	0.3	0.0	0.0	0.5
Removal for Other Personal Reasons	0.0	0.0	0.0	1.5	0.9	0.0	0.0	0.2	1.1	1.0
Continuation	91.5	95.9	93.3	96.4	91.2	86.1	81.4	88.1	86.6	86.9

[a]6 weeks—6 months postpartum.
[b]Within 10 minutes of placental expulsion.

Interval Insertions—For women who had a Lippes Loop D or Copper T IUD inserted between six weeks and six months postpartum, expulsion and other termination rates were low at three months post-insertion (Table 2). There were no statistically significant differences in IUD performance over the first six months post-insertion between those who were fully breastfeeding and those who were not breastfeeding. Three-month expulsion rates were higher among fully breastfeeding women with Lippes Loops and lower among fully breastfeeding women with Copper Ts when compared with their respective non-breastfeeding subgroups. Although the respective expulsion rate curves were separated over the entire six months, they did not differ significantly.

Insertions Immediately Postpartum—When an IUD was inserted within 10 minutes of placental expulsion, there were no statistically significant differences in the IUD performance over the first six months post-insertion between fully breastfeeding and non-breastfeeding women (Table 2). For fully breastfeeding women using either Copper Ts or Delta Copper Ts, the three-month expulsion rates are higher when compared with their respective non-breastfeeding subgroups. The difference in three-month expulsion rates was in the opposite direction for users of Delta Loops. In all three comparisons, however, the six-month expulsion rate curves did not differ significantly.

Age and number of live births, two variables associated with IUD performance, were used as controls to further look

TABLE 3—Three Month Expulsion Rates for Fully Breastfeeding and Non-Breastfeeding Women by Type of IUD for Immediate Postpartum Insertions, Controlling for Age, Live Births, and Education

Immediate Postpartum Insertions[a]	Copper T Breastfeeding Status		Delta Loop Breastfeeding Status		Delta Copper T Breastfeeding Status	
	None	Full	None	Full	None	Full
Expulsion						
Age strata						
	(N = 113)	(N = 85)	(N = 321)	(N = 440)	(N = 193)	(N = 221)
<30	7.5	10.3	17.2	12.2	8.2	10.0
	(N = 33)	(N = 33)	(N = 121)	(N = 182)	(N = 36)	(N = 61)
30+	6.5	12.7	12.7	7.4	11.7	11.3
Live births						
	(N = 62)*	(N = 56)	(N = 130)	(N = 181)	(N = 92)	(N = 94)
1	8.4	11.3	19.7	15.9	9.1	7.9
	(N = 83)	(N = 62)	(N = 312)	(N = 441)	(N = 137)	(N = 188)
2+	6.5	10.7	14.4	8.9	8.5	11.4

[a]Within 10 minutes of placental expulsion.
*The number of live births was missing for one non-breastfeeding woman.

at expulsion rates, the major reason for discontinuation of IUDs inserted immediately postpartum. Of the 12 comparisons, none are statistically significant (Table 3).

Discussion

The results of this analysis indicate that IUD insertion for breastfeeding women would be appropriate whether done immediately after delivery or at a later time.

Although the results are encouraging with respect to IUD use by breastfeeding women, they should be considered preliminary since the data were pooled and, for some comparisons, the sample sizes were modest. By pooling data from a number of collaborating institutions, potentially important differences among centers are not only ignored but may actually affect the comparisons between breastfeeding and non-breastfeeding women. This can occur if IUD users from an individual center are numerically out of balance with respect to lactation status. In order to partially control for this problem the centers we chose for this analysis had data that were, at most, out of balance by a 3 to 1 ratio.

The earlier study which found a significant difference in expulsion rates at 12 months for the Copper T was based on interval insertions[9]; the difference they found may be attributed to the fact that the partial breastfeeders and full breastfeeders were combined.** Furthermore, this earlier study did not find a significant increase in expulsion rates for the Copper 7.

Whatever the underlying explanations, the finding of a lack of any statistically significant differences in IUD event and continuation rates for fully breastfeeding women compared with non-breastfeeding women suggests that breastfeeding is not a contraindication to IUD use. Indeed, because other studies have found that IUDs do not appear to have any adverse effect on lactation, IUDs may be a particularly suitable contraceptive method for breastfeeding women.

Other considerations should, therefore, determine whether a breastfeeding woman has an IUD inserted and, if so, when insertion takes place.[1,16] Of particular concern for a breastfeeding woman is the desire to minimize the overlap between lactational infecundity and contraceptive use. However, a mathematical evaluation of the optimal time to begin contraception found that the effect on fertility was greatest with immediately postpartum contraceptive initiation, including IUD insertions.[17] Early initiation was particularly advantageous where the duration of breastfeeding and thus the duration of infecundity was short. For other women, too, this may be a convenient time for IUD insertion. From a practical point of view, delivery may be a woman's only contact with the medical system and thus may be her only opportunity for IUD insertion. Furthermore, overlap of lactational infecundity with IUD use may be less problematic than overlap with other contraceptive methods that require continuous motivation. Later insertion of an IUD should be advised only when it is reasonably certain that a woman will return. Many women throughout the world do indeed request IUD insertion six or more weeks after delivery.

Whether a woman has an IUD inserted immediately postpartum or at a later visit, she can be assured that her breastfeeding performance will not be adversely affected by the IUD and that IUD retention will not be adversely affected by breastfeeding.

**Because the question on breastfeeding status could be coded only as "breastfeeding" or "no breastfeeding," partial breastfeeding and full breastfeeding were unavoidably combined in the analysis.

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ACKNOWLEDGMENTS

Partial support for this study was provided by the International Fertility Research Program with funds from the US Agency for International Development. The authors wish to express their gratitude to the many collaborators in the IFRP network who have contributed data used in the preparation of this paper.

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Abbott Laboratories has announced that "Laboratory Advances in Rubella Diagnosis," an educational monograph, is available free in limited quantities from Abbott.

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Recent relief situations in Thailand, Somalia, and Honduras demonstrate that providing refugee health care is not self-evident to otherwise well-educated health professionals without prior experience or training and orientation. As a result, the National Council for International Health (NCIH) has developed a workshop, "International Refugee Relief: The Health Worker and the Level of Care," to orient health professionals in the United States to appropriate health care in the international refugee relief setting.

This workshop, cosponsored by the NCIH and area agencies, has been presented in Los Angeles, California, Minneapolis, Minnesota, and Worcester, Massachusetts. Future workshops are planned for Seattle, Washington and Washington, DC in 1983. Faculty will be composed of health professionals and representatives of voluntary agencies with experience in the refugee camps of Southeast Asia, East Africa, and Central America.

The three-day program provides an introduction to health practices in overseas refugee situations and to the issues that surround these practices. It is intended primarily for health professionals, employees of relief agencies and students and geared to those with an active interest but little or no field experience in refugee work.

For further information, contact Bruce Feldstein, MD, Medical Adviser, or Graeme Frelick, Clearinghouse Coordinator, National Council for International Health, 2121 Virginia Avenue, NW, Suite 303, Washington, DC 20037.