The Effect of Breastfeeding on Breast Aesthetics

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BACKGROUND: The health benefits of breast milk for infants are well documented, but breastfeeding is avoided by many women because of concerns about a negative effect upon breast appearance. However, there is very little objective data to either support or refute this view.

OBJECTIVE: The purpose of this study is to identify risk factors for the development of breast ptosis after pregnancy and to determine whether breastfeeding has an adverse effect on breast shape.

METHODS: Charts were reviewed of all patients seeking consultation for aesthetic breast surgery between 1998 and 2006. History of pregnancies, breastfeeding, and weight gain were obtained via telephone interview. Degree of breast ptosis was determined from preoperative photos. Nulliparous women were excluded. Logistic regression analysis was performed to identify independent predictors of postpregnancy breast ptosis.

RESULTS: Ninety-three patients met the study criteria. Fifty-four patients (58%) reported a history of breastfeeding. The mean age at surgery in the breastfeeding group was 41 years, compared to 37 years in the nonbreastfeeding group. An adverse change in breast shape following pregnancy was described by 51 respondents (55%). Greater age, higher body mass index, greater number of pregnancies, larger prepregnancy bra size, and smoking were identified as significant independent risk factors for postpregnancy breast ptosis ($P < .05$). Breastfeeding was not found to be an independent risk factor for ptosis.

CONCLUSIONS: The risk of breast ptosis increases with each pregnancy, but breastfeeding does not seem to worsen these effects. Expectant mothers should be reassured that breastfeeding does not appear to have an adverse effect upon breast appearance. (*Aesthetic Surg J 2008;28:534–537.*)

Breast milk provides many indisputable health benefits to infants. Epidemiologic research has shown that breastfed infants have improved general health, growth, and development, and a lower risk of many acute and chronic illnesses than bottle-fed infants.[1–5] However, rates of breastfeeding remain low in many industrialized and developing countries. In a 2003 survey, 66% of new mothers reported an intent to breastfeed, and the rate of breastfeeding at 6 months after delivery was 32.8%.[6] Despite widespread advocacy, these rates have not changed substantially in more than 20 years.[1]

One of the most common reasons cited by women for electing not to breastfeed is the fear that lactation will adversely affect the appearance of the breasts.[7–9] This notion is disputed by pediatricians and lactation experts, but is widely held by women and seems to cross both cultural and socioeconomic boundaries.[10–12] Despite strongly-held opinions on both sides of the issue, there is little objective data in the literature to either support or refute a detrimental effect of breastfeeding upon breast aesthetics. The purpose of this study is to survey a large population of healthy postpartum women presenting for aesthetic improvement of the breasts to identify risk factors for the development of breast ptosis after pregnancy, and to determine whether breastfeeding has an adverse effect on breast shape.

METHODS

This study was approved by the sponsoring institution's review board for research involving human subjects. A review was conducted of all patients who presented to the plastic surgery clinic at the University of Kentucky between 1998 and 2006 in consultation for breast augmentation or mastopexy. Clinic charts were accessed to obtain demographic data, medical history, and body mass index (BMI). Patients who underwent breast augmentation or mastopexy as part of a postmastectomy reconstructive effort were excluded from the study.

Patients were contacted via telephone and asked a standardized battery of questions. A detailed pregnancy and breastfeeding history was obtained, including number of pregnancies, whether or not the patient breastfed her children, and the duration of breastfeeding. A histo-

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ry of weight loss or gain was obtained, including weight gain during each pregnancy. Women who were nulliparous at the time of the initial consultation or who gave a history of a non–pregnancy-related weight loss of more than 50 pounds were excluded from the study. Patients were asked to provide their bra cup size before their first pregnancy and their current bra size. Patients were asked to subjectively describe how the size and shape of their breasts had changed following pregnancy, and a smoking history was obtained.

Standardized frontal and lateral photographs taken at the time of the initial consultation were reviewed to determine the degree of breast ptosis. The classification system of Regnault[13] was used. In this system, grade 0 (no ptosis) is defined by the presence of the nipple above the level of the inframammary fold. Grade 1 (minor) ptosis is characterized by a nipple position at the level of the inframammary fold. In grade 2 (moderate) ptosis, the nipple is located below the inframammary fold, but above the lower contour of the breast. In grade 3 (major) ptosis, the nipple is located below the fold level and at the lower contour of the breast.[13] Patients were assigned a ptosis score of 0, 1, 2, or 3, accordingly.

Patients who had a history of breastfeeding were compared to the nonbreastfeeding group to assess homogeneity. Age, number of pregnancies, BMI, and weight gain during pregnancy were compared using the Student *t* test. Smoking history and preoperative bra size were compared using the χ^2 test. Because of small sample sizes, C and D cup patients were combined into 1 group for this comparison (Table 1). $P < .05$ was considered statistically significant. A multivariable logistic regression analysis was performed, using degree of breast ptosis as the dependent variable and each of the following independent variables: age, number of pregnancies, history of breastfeeding, duration of breastfeeding, BMI, prepregnancy bra cup size, history of smoking, and weight gain during pregnancy, to determine which factors were independent predictors of an increased degree of breast ptosis.

RESULTS

One hundred thirty-two patients were successfully contacted via telephone. Ninety-three patients had 1 term pregnancy or more before the initial consultation and met the other study criteria. Fifty-one of these patients underwent breast augmentation alone, 15 underwent mastopexy alone, and 27 underwent augmentation and mastopexy. The mean age at surgery was 39 years (range, 22 to 53 years), and 54 patients (58%) gave a history of breastfeeding 1 or more children. The total duration of breastfeeding (all pregnancies combined) ranged from 2 to 25 months (mean, 9 months). Weight gain during pregnancy ranged from 5 to 45 kg (mean, 19 kg). Thirty-two patients (39%) gave a history of smoking before the consultation. An adverse change in breast shape following pregnancy was described by 51 respondents (55%), with the most common descriptors being "droopy," "saggy," or "less full." Forty-three respondents (46%) reported no change in breast size following pregnancy. Thirty-five patients (37%) reported that their breasts became smaller, and 15 (16%) reported that their breasts became larger.

In order to assess heterogeneity, the subset of patients who gave a history of breastfeeding (n = 54) was compared with those who did not (n = 39). The breastfeeding group had a mean age of 37 years, compared to 41 years in the nonbreastfeeding group. This difference was found to be statistically significant. The preoperative BMI and weight gain during pregnancy were both found to be significantly higher in the nonbreastfeeding group. There was a trend toward higher prepregnancy bra cup size in the breastfeeding group (Table 1).

Table 1. Comparison of patients with a history of breastfeeding and those without

	Breastfeeding	No breastfeeding	*P*	Statistical test
No. of patients	54	39	–	–
Age (y, mean ± SD)	37 ± 7.5	41 ± 7.3	.01	Student *t*
No. of pregnancies (range)	1–4	1–5	–	–
No. of pregnancies (mean ± SD)	2.6 ± 1.0	2.5 ± 0.9	.64	Student *t*
BMI (kg/m^2, mean ± SD)	22.6 ± 3.3	25.4 ± 4.4	<.01	Student *t*
Weight gain during each pregnancy (lbs, mean ± SD)	37.4 ± 7.3	41 ± 7.3	5.83	Student *t*
Smoking history	22 (41%)	15 (39%)	.79	χ^2
Prepregnancy bra cup size				
A	7 (13%)	17 (44%)	<.01	χ^2
B	26 (48%)	13 (33%)		
C	19 (35%)	9 (23%)		
D	2 (4%)	0 (0%)		

BMI, Body mass index; *SD*, standard deviation.

A multivariable logistic regression analysis was performed to identify independent risk factors for breast ptosis. Greater age, higher BMI, greater number of pregnancies, larger prepregnancy bra cup size, and smoking history were identified as significant independent risk factors for an increased incidence of breast ptosis (Table 2). A history of breastfeeding was not found to be an independent risk factor for breast ptosis, nor did the risk of breast ptosis increase with increased duration of breastfeeding. Weight gain during pregnancy was also not found to be a significant predictor for breast ptosis.

DISCUSSION

There is a well known link between body image and the decision to breastfeed,[9,10,14] and many women believe that breastfeeding has a negative effect upon the appearance of the breasts. Women consulting a plastic surgeon for postpartum body contouring will often attribute the loss of breast shape or volume to lactation and breastfeeding. In published reports, concerns over changes in breast appearance are consistently ranked among the most important reasons women elect not to breastfeed their infants. These attitudes are encountered in a remarkable variety of cultures, socioeconomic settings, and age groups. In a survey of high school students in Naples, Italy, 30% of respondents expressed a belief that breastfeeding would "make breasts ugly."[7] In a survey of 220 young mothers in the Dominican Republic, concern about "loss of breast shape" was cited as the second most important reason for early termination of breastfeeding in their community, following only "insufficient milk supply."[11] Published surveys conducted in Taiwan, Israel, and Indonesia[12] echo these results.

Concerns over the physical effects of breastfeeding are also prevalent in the English-speaking world. Babycenter.com, a popular online resource for new mothers, maintains an interactive bulletin board of information regarding breastfeeding. An "ask the experts" section lists 103 questions covering all aspects of lactation and infant feeding. The topic titled "How will breastfeeding change the appearance of my breasts?" generated a string of 366 user responses, more than any other topic,[15] with many respondents expressing disappointment over the negative effect they believe breastfeeding has had on their breasts.

Table 2. Results of logistic regression analysis with degree of breast ptosis as the dependent variable

Independent variable	*P*	Odds ratio	95% confidence interval
Age	.01	1.14	1.01–1.27
No. of pregnancies	.04	3.01	1.03–9.16
Body mass index	<.01	1.31	1.08–1.60
Smoking history	<.01	40.9	3.49–478.2
Weight gained during pregnancy	.62	0.61	0.98–1.03
Prepregnancy bra cup size	<.01	30.4	5.50–168.2
Breastfeeding history	.94	1.03	0.79–1.12
Total duration of breastfeeding	.49	0.94	1.08–1.60

The medical community has offered little guidance on the subject. Pediatricians and lactation experts have always asserted that breastfeeding has no effect on breast shape.[8,16] However, there is very little objective data to either support or refute this viewpoint. In a 2004 survey of 496 new mothers, 73% reported a change in the appearance of the breasts following pregnancy. "Changes" was reported in 75% of mothers who had breastfed and in 69% of nonbreastfeeding mothers. This difference was not statistically significant, and the authors concluded that breastfeeding does not affect postpregnancy breast shape. However, the assessment of "breast change" was based on the subjective opinion of the interviewee rather than an objective measurement. Furthermore, no distinction was made about the amount of change, or if the change was a positive or negative one.

The plastic surgeon's office is uniquely suited for studying this problem. One has access to a large population of healthy postpartum women seeking aesthetic improvement of the breasts. Standardized photographs are taken, which can be used for an objective assessment of breast shape. Because this population consists only of those women seeking aesthetic improvements, however, the data may be skewed toward more severe postpregnancy breast changes. For this reason, no attempt was made to use this study to draw conclusions regarding the prevalence of postpregnancy breast changes in the general population.

This is a retrospective study with inherent limitations. The patients were not randomized to breastfeeding and nonbreastfeeding groups, and some differences were observed in the composition of the 2 groups (Table 1). Namely, the breastfeeding group was slightly younger at presentation than the nonbreastfeeding group (37 vs 41 yrs). The breastfeeding group also had a lower average BMI. Because both of these factors were independent predictors of breast ptosis, these differences would tend to skew the data toward higher rates of ptosis in the nonbreastfeeding group. However, there was a trend toward smaller prepregnancy bra cup size in the nonbreastfeeding group, which would tend to have the opposite effect.

A well designed prospective study is needed to further elucidate the effects of pregnancy, breastfeeding, and smoking on breast shape. Such a study would follow healthy women before, during, and after pregnancy, documenting the effects on breast shape and size. The study should follow patients through at least 3 pregnancies, and those in the breastfeeding group would need to have engaged in breastfeeding for at least 3 months. We have begun enrollment for just such a study at our institution.

Not surprisingly, the number of past pregnancies was found to be an independent predictor of ptosis upon logistic regression analysis. Regnault[13] attributed ptosis

after pregnancy to hormone regression, but there is almost certainly a mechanical cause as well, with the skin envelope and suspensory (Cooper's) ligaments of the breast experiencing increased strain from the engorgement of pregnancy. The observed association between higher bra cup size, higher BMI, and ptosis is probably also a function of increased breast weight. Applying the same reasoning, one might expect to see a relationship between ptosis and breastfeeding, as women who participate in breastfeeding experience a longer duration of breast engorgement per pregnancy, with a greater total strain on the suspensory system of the breast. However, breastfeeding was not found to be an independent risk factor for the development of postpregnancy breast ptosis. The observed association of age and cigarette smoking with breast ptosis likely relates to the loss of skin and ligamentous elasticity seen in both of these conditions.

CONCLUSIONS

These findings support the assertion of pediatricians and lactation specialists that breastfeeding does not adversely affect breast shape. A history of breastfeeding was not found to be associated with a greater degree of breast ptosis in patients presenting for postpregnancy aesthetic breast surgery. Age and cigarette smoking, both of which are associated with a loss of skin elasticity, were found to be positive predictors for breast ptosis, as were larger prepregnancy bra cup size and number of pregnancies. Whereas breast ptosis appears to increase with each additional pregnancy, breastfeeding does not seem to worsen these effects. Expectant mothers should be reassured that breastfeeding does not appear to have an adverse effect upon breast appearance, beyond the effects of pregnancy alone. ◗

DISCLOSURES

The authors have no disclosures with respect to the contents of this article.

REFERENCES

1. Work Group on Breastfeeding. American Academy of Pediatrics. Breastfeeding and the use of human milk. *Pediatrics* 1997;100:1035–1039.
2. Dewey KG, Heinig MJ, Nommsen-Rivers LA. Differences in morbidity between breast-fed and formula-fed infants. *J Pediatr* 1995;126:696–702.
3. Howie PW, Forsyth JS, Ogston SA, Clark A, Florey CD. Protective effect of breast feeding against infection. *Br Med J* 1990;300:11–16.
4. Kovar MG, Serdula MK, Marks JS, Fraser DW. Review of the epidemiologic evidence for an association between infant feeding and infant health. *Pediatrics* 1984;74(suppl):S615–S638.
5. Beaudry M, Dufour R, Marcoux S. Relation between infant feeding and infections during the first six months of life. *J Pediatr* 1995;126:191–197.
6. Ryan AS, Zhou W, Arensberg MB. The effect of employment status on breastfeeding in the United States. *Womens Health Issues* 2006;16:243–251.
7. Pisacane A, Continisio P. Breastfeeding and perceived changes in the appearance of the breasts: a retrospective study. *Acta Paediatr* 2004;93:1346–1348.
8. Weichart C. Breast-feeding: first thoughts. *Pediatrics* 1975;56:987–990.
9. Foster SF, Slade P, Wilson K. Body image, maternal fetal attachment, and breast feeding. *J Psychosom Res* 1996;41:181–184.
10. Huang H-C, Wang S-Y, Chen C-H. Body image, maternal-fetal attachment, and choice of infant feeding method: a study in Taiwan. *Birth* 2004;31:183–188.
11. McLennan JD. Early termination of breast-feeding in periurban Santo Domingo, Dominican Republic: mothers' community perceptions and personal practices. *Rev Panam Salud Publica* 2001;9:362–367.
12. Hull V, Thapa S, Pratomo H. Breast-feeding in the modern health sector in Indonesia: the mother's perspective. *Soc Sci Med* 1990;30:625–633.
13. Regnault P. Breast ptosis: definition and treatment. *Clin Plast Surg* 1976;3:193–203.
14. Barnes J, Stein A, Smith T, Pollock JI. ALSPAC Study Team. Extreme attitudes to body shape, social and psychological factors and a reluctance to breast feed. *J R Soc Med* 1997;90:551–559.
15. Babycenter Web site. Breastfeeding your baby index. (Accessed 6/4/2007, at http://www.babycenter.com/baby/babybreastfeed/index.)
16. Donovan P. Dangerous myths. *Hygie* 1992;11:7–8.

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