



## Does Breast Feeding Protect from Development of Breast Disease?

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### Abstract

**Objective:** To assess the protective effect of breast feeding against developing different types of breast diseases.

**Method:** We retrospectively analyzed the data base of the breast unit at King Fahd Hospital from January 2000 till May 2012. We calculated proportions with 95% confidence intervals (CI) and used Logistic regression analysis to explore the predictors. Odds ratios with 95% CI were reported and p value of 0.05 was considered for significance.

**Results:** Breast feeding data were available for 1970 parous women of which 1856 (94.3%; 95% CI: 93.1%-95.2%) breast fed their babies. Of 114 patients who did not breast feed, 102 (89.4%; 82.5%-93.9%) develop breast diseases compared to 1564 (84.3%; 82.5%-85.9%) of the patients who breast fed (1856) with a p value of 0.144. Younger age (average of 41.2 years compared to 44.6 years) was significantly associated with breast disease development ( $p < 0.001$ ). Different reasons were behind not breast feeding, the commonest of which was "Lack of milk", nipple retraction and cesarean section (21.8%, 20.0% and 14.5% respectively). Younger age, less parity and previous cesarean section significantly correlated with the non-breast feeding practice ( $p$  value 0.013,  $< 0.001$  and 0.036 respectively).

**Conclusion:** Mothers who did not breast feed were more prone to develop breast diseases but that did not reach statistical significance. Younger age was significantly associated with no breast feeding practice and development of breast diseases. Cesarean section is a significant factor associated with no breast feeding.

### Keywords

Breast feeding, Breast diseases, Cesarean section

### Introduction

Several reports have addressed the protective role of breast feeding against development of breast cancer [1-4]. It was reported that breast feeding for more than 12 months was associated with reduced risk of breast carcinoma by 26% [5].

Although breast cancer is known worldwide as the most aggressive illness that can develop in a women's breast, benign breast conditions are much more common, some with chronic pattern

and can deleteriously affect the women's health and social life like fibrocystic changes, mastalgia and chronic inflammatory conditions [6].

The protective effect that can be provided by breast feeding against future development of breast diseases in general was not equally investigated as in case of breast cancer. Breast feeding may beneficially affect the relation between mammary epithelium and stroma which could subsequently be a stimulus for future diseases development [3].

We studied the breast feeding practice in our patients, their outcome in term of breast disease development in their future life and reasons for the non-breast feeding practice.

### Patients and Methods

This is a retrospective analysis of the Breast Unit data base at King Fahd General Hospital in Jeddah, Saudi Arabia which was reviewed from January 2000 till May 2012. The data base includes data of all patients seen at the breast clinic including demographic data, history and clinical examination, breast imaging, surgical/medical treatment, pathology data and follow up information. This study period was chosen since the required information was better documented starting by year 2000.

In Saudi Arabia, breast feeding is a well-known and encouraged practice in rural as well as urban locations. Two years duration of breast feeding is commonly practiced based on religious as well as social advice. Some local hospitals provide extensive education for pregnant ladies about the whole process of breast feeding including its benefits especially for 1<sup>st</sup> time mothers and continue their support for one week after delivery. Unfortunately, there is an observed recent trend toward short duration of breast feeding due to the increasing number of working mothers accompanied with easy access to the formula milk.

In our data, duration of lactation was extremely variable; multiparous women breast feed each child for a different duration than the other so the average duration of lactation was documented. There were no documented data about exclusive and partial breast feeding.

Family history of breast cancer was regarded as positive if a first, second or third degree family member was affected based on the history provided by the patient.

**Citation:** Baslaim MM, Farrokhyar F, Al-Amoudi SA, Ashoor AA, Saidam OM (2016) Does Breast Feeding Protect from Development of Breast Disease?. Clin Med Rev Case Rep 3:102

**Received:** March 10, 2016: **Accepted:** April 18, 2016: **Published:** April 20, 2016

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**Table 1:** Univariate analysis of patient characteristics for breast disease.

Patient characteristics	Breast Disease		p value
	No (N = 316)	Yes (N = 1716)	
<b>Age (years)</b>	N = 314	N = 1714	
Mean (SD)	44.6 (9.7)	41.2 (10.4)	< 0.001
Min, Max	20, 80	18, 81	
<b>Parity (# of deliveries)</b>	N = 316	N = 1716	
Median (Min, Max)	4 (1, 8)	4 (1, 8)	0.489
<b>History of benign breast disease</b>			
No	288 (91.4%)	1528 (89.0%)	0.206
Yes	27 (8.6%)	188 (11.0%)	
<b>History of cancer</b>			
No	314 (99.4%)	1709 (99.6%)	0.580
Yes	2 (0.6%)	7 (0.4%)	
<b>Family history of breast cancer</b>			
No	252 (79.7%)	1515 (88.3%)	< 0.001
Yes	64 (20.3%)	201 (11.7%)	
<b>Caesarean section</b>			
No	248 (80.3%)	1416 (84.0%)	0.105
Yes	61 (19.7%)	270 (16.0%)	
<b># of caesarean section</b>	N = 61	N = 270	
Median (Min, Max)	1 (1, 6)	2 (1, 7)	0.861

We reviewed parous patient's data on demographics, parity, lactation history, history of cesarean section and the presenting breast diseases. Bilateral mammography was done for patients'  $\geq 40$  year-old and bilateral breast ultrasound was done for patients below 40 year-old.

## Statistical Analysis

Categorical data are expressed as counts and percentages and continuous data as mean with standard deviation or median with range. Chi-squared test was used for comparison of categorical data and independent samples t-test or Mann-Whitney U test was used for continuous and ordinal data. Proportions with their corresponding confidence intervals are reported. All tests were two-sided and *p* value for significance was set at 0.05. Statistical analysis was performed using SPSS version 22.0 (<http://www.ibm.com/in-en/>).

## Results

### Demographic data and risk factors

There were 2032 parous patients; average age 41.8 years (range: 18-81 years) and median parity of 4 (range: 1-18). History of benign breast diseases was found in 215/2032 (10.6%; 9.3%-12.0%). Family history of breast cancer was found in 265/2032 (13%); out of these 118/265 (44.5%) were 1<sup>st</sup> degree relative and 75/265 (28.3%) were  $\leq 40$  years of age. **Table 1** compares the demographics and risk factors between patients with breast disease and those without. Younger age was a significant factor for breast disease; mean age of 41.2 years compared to 44.6 years in women who did not develop breast diseases (*p* < 0.001).

### Lactation history and breast diseases

Out of 2032, breast feeding data were available for 1970 only; 1856 (94.2%; 93.1%-95.2%) breast fed their babies and 114 (5.8%; 4.8%- 6.9%) did not breast feed. Average duration of breast feeding was 15.2 months.

Patients who did not breast feed were found to be more prone to develop breast diseases (102/114, 89.5%; 95% CI: 82.5%- 93.9%) compared to patients who breast fed (1564/1856, 84.3%; 95% CI: 82.5%-85.9%) but that did not reach statistical significance (*p* value 0.144).

Patients' characteristics that were related to the practice of breast feeding based on univariable analysis were summarized in **Table 2**; only younger age, less parity and previous CS significantly related with the non-breast feeding practice (*p* value 0.013, < 0.001 and 0.036 respectively).

**Table 2:** Univariate analysis of patient characteristics between patients who breast fed and patients who did not.

Patient characteristics	History of Breast Feeding		p value
	No (N = 114)	Yes (N = 1856)	
<b>Age (years)</b>	N = 114	N = 1852	
Mean (SD)	39.4 (10.4)	41.9 (10.3)	0.013
Min, Max	19, 60	18, 81	
<b>Parity (# of deliveries)</b>	N = 114	N = 1856	
Median (Min, Max)	2 (1, 8)	4 (1, 8)	< 0.001
<b>History of benign breast disease</b>	N = 114	N = 1856	
No	102 (89.4%)	1666 (89.8%)	0.873
Yes	12 (10.6%)	190 (10.2%)	
<b>History of cancer</b>	N = 114	N = 1856	
No	113 (99.1%)	1848 (99.6%)	0.416
Yes	1 (0.9%)	8 (0.4%)	
<b>Family history of breast cancer</b>	N = 114	N = 1856	
No	101 (88.6%)	1161 (94.2%)	0.669
Yes	13 (11.4%)	245 (13.2%)	
<b>Cesarean section</b>	N = 111	N = 1822	
No	84 (75.7%)	1524 (83.6%)	0.036
Yes	27 (24.5%)	298 (16.4%)	
<b># of cesarean section</b>	N = 27	N = 298	
Median (Min, Max)	2 (1, 5)	2 (1, 7)	0.585

Reasons reported by patients for not breast feeding were available for 55 women only; the commonest reason was "No milk" an expression used by the patients and it may indicate insufficient milk production rather than absolute absence of milk. Nipple retraction was the second commonest reason for not breast feeding followed by cesarean section (CS) delivery. History of CS was positive in 331/2032 (16.6%) with a median number of CS of 2 (range: 1-7).

### Pattern of breast diseases in the studied groups

Mastalgia (breast pain without clinical or radiologic abnormalities) was the commonest breast disease encountered (666/2032; 32.8%; 95% CI: 30.8%-34.8%) in these patients followed by fibro-cystic changes (307/2032; 15.1%; 95% CI: 13.6%- 16.7%); the latter presented actually with breast pain or painful mass and diagnosed with mammography and/ or breast ultra-sound. Some patients (316/ 2032, 15.6%; 95% CI: 14.0%-17.2%) presented with what they thought to be a palpable mass but they had no clinical nor radiologic evidence of disease so they were labeled as "Normal".

Interestingly, there was a pattern of breast diseases in each group (**Table 3**). Acute inflammatory conditions (e.g.; mastitis and abscesses), benign lumps (e.g.; ductal adenoma, hamartoma), axillary breast, duct ectasia, fibro-adenomas and phyllodes and galactocele occurred slightly less frequently in breast feeding patients. On the contrary, mastalgia, fibrocystic changes, breast cancer, intra-ductal papilloma and chronic inflammatory conditions were slightly more frequent in patients with history of breast feeding with no statistically significant differences.

## Discussion

Breast feeding is a natural process that has proven benefits for the mother and the baby. Although in our study development of breast disease was higher in the non-breast feeding women but that did not reach statistical significance (*p* 0.144). Different theories have been reported about the mechanism for a protective effect of lactation on the breast tissue. For example, breast fluid estrogen levels are suppressed for several years after lactation; this may diminish breast cancer risk by altering the hormonal milieu [1,2]. Breast milk protects the breast tissue by excretion of fat soluble carcinogens, the level of a potential carcinogen, cholesterol  $\beta$ -epoxide, is lower in the breast fluid of women during lactation and for up to 2 years after lactation. Also lactation may alter the breast tissue so that it is less exposed to potential carcinogens and more exposed to potentially protective agents [2]. Direct physical changes in the breast that accompany milk production may also contribute to the observed protective effect [3,4].

**Table 3:** Univariate analysis of breast disease outcomes between patients who breast fed and patients who did not.

Breast Disease Type	History of breastfeeding		p value
	No (N = 114)	Yes (N = 1856)	
Acute Inflammatory Conditions	N = 114	N = 1856	0.346
No	110 (96.5%)	1813 (97.7%)	
Benign Lumps	4 (3.5%)	43 (2.3%)	0.258
No	N = 114	N = 1856	
Axillary Breast	112 (98.2%)	1841 (99.2%)	0.363
Yes	2 (1.8%)	15 (0.8%)	
Duct Ectasia	N = 114	N = 1856	0.128
No	107 (93.9%)	1772 (95.5%)	
Fibroadenoma & Phyllodes	7 (6.1%)	84 (4.5%)	0.131
No	N = 114	N = 1856	
Yes	104 (91.2%)	1760 (94.8%)	
Yes	15 (13.2%)	96 (5.2%)	
Galactocole	N = 114	N = 1856	0.646
No	112 (98.2%)	1834 (98.8%)	
Mastalgia	2 (1.8%)	22 (1.2%)	0.354
No	N = 114	N = 1856	
Yes	82 (71.9%)	1250 (67.3%)	0.789
Yes	32 (28.1%)	606 (32.7%)	
Fibrocystic changes	N = 114	N = 1856	1.00
No	98 (86.0%)	1572 (84.7%)	
Cancer	Yes	16 (14.0%)	1.00
No	N = 114	N = 1856	
Intra-Ductal Papilloma	103 (90.4%)	1669 (89.9%)	
Yes	11 (9.6%)	187 (10.1%)	
Chronic Inflammatory Conditions	N = 114	N = 1856	1.00
No	112 (98.2%)	1816 (97.8%)	
Yes	2 (1.8%)	40 (2.2%)	
Yes	1 (0.9%)	22 (1.2%)	1.00

<sup>1</sup>E.g.: Mastitis, Abscess

<sup>2</sup>E.g.: Ductal adenoma, Hamartoma

<sup>3</sup>E.g.: Idiopathic granulomatous mastitis, Mammary tuberculosis

Breast diseases were more prevalent in younger age (average 41.2 years compared to 44.6 years. This could be explained by the fact that younger women (< 40 years old) tend to be more self-aware and they seek medical attention regularly. Another explanation is that breast pain and benign breast conditions are the commonest breast diseases and they actually affect younger age group [6]. They have a chronic and a relapsing pattern that requires frequent medical attention.

It was noted that family history of breast cancer was significantly less documented in women who developed breast diseases (11.7% vs 20.3%;  $p < 0.001$ ). This might be related to their subconscious fear of mentioning it in their history or a far degree relative was affected and not documented in our data.

In our culture, multi-parity and breast feeding are common, the number of deliveries may reach up to 18 and breast feeding for 24 months is a common practice. However, some ladies did not breast feed due to different reasons. "No milk" was the commonest encountered reason for that. Ductal anatomy of the breast may influence milk ejection; larger ducts are associated with more and longer duration of milk production [7]. Byers *et al.* proposed that the inability to breast feed due to insufficient milk supply could be due to malfunctioning of the breast tissue and they found that the risk of breast cancer was greater among this group [8]. If that is true

then all nursing mothers should be informed to report their inability to breast feed to their caring physician who should document that and provide them with the required investigation. Having said that, I don't think we have the proper tool to definitely exclude a malfunctioning breast tissue. The available radiology work-up in the form of mammography, ultrasound and magnetic resonance imaging can detect an underlying breast lesion that has already formed but not the one in evolution. Added to that, it is well known that in the very early postpartum days milk production may be scanty which may encourage an in-experienced mother to proceed for bottle feeding. Midwifery and educating nurse should encourage mothers especially young/first time exposed to continue breast feeding.

Other reasons like abnormal milk color or breast engorgement with no milk production need to be documented and investigated by the educating nurse to provide the required management and if possible prevent it from occurring after subsequent deliveries. The unrelieved milk engorgement causes over distention of the ducts with subsequent disruption in the duct wall and possible extra-vasation of milk into the surrounding stroma with subsequent inflammatory process [9]. Nipple retraction especially if in a moderate to severe form will not allow the baby to latch on the nipple. If breast milk was not evacuated properly, mammary ducts will distend, secretions stagnates within the ducts and may cause inflammation and sometimes superadded infection which if recurred will further worsen nipple retraction due to fibrosis. This may explain the higher rate of acute inflammatory conditions and galactocele in the non-breast feeding women.

Cesarean section delivery is becoming more and more popular and was specifically linked with the practice of less breast feeding. In a study done by Kacmak *et al.*, they said that when delivery takes place by cesarean section, the mother becomes a surgical patient with all the inherent risks and problems [10]. In another study by Zanardo *et al.*, breast feeding prevalence in the delivery room was significantly higher after vaginal delivery compared with that after cesarean delivery and a longer interval occurred between birth and first breastfeeding in the newborns delivered by cesarean section [11]. It was found that (Table 2) history of cesarean section was significantly higher in women who did not breast feed their babies regardless of the numbers of cesarean sections. Compared with elective cesarean section delivery, vaginal delivery was associated with a higher breast feeding rate at discharge and at the subsequent follow-up steps at 1, 12 and 24 weeks of life [11]. Ante-partum and post-partum availability of midwifery and nursing education is a major requisite for avoiding breast feeding problems in that period.

Working mothers are forced to leave their babies and need to be supported by providing time and a suitable place at work (nursery) in order to be able to continue breast feeding [12].

Previous breast surgery is not an absolute contraindication of breast feeding unless major ducts were damaged or radiation therapy delivered. It is recommended to explain to women who underwent any surgical intervention that they should try to breast feed as long as they experience breast engorgement and milk expression.

The average age of the non-breast feeding women was 39.4 years compared to 41.9 years for the breast feeding women; this difference was statistically significant ( $p = 0.013$ ). It is expected that younger mothers will have less experience about breast feeding and require more support [13]. The same was applied to parity; an average parity of 2 was seen in the non-breast feeding women compared to 4 in the breast feeding women ( $p < 0.001$ ).

The current evidence has certain limitations due to inherent biases applied to observational designs. It is a retrospective analysis and prone to missing/inaccurate data. We did not a *priori* power our study to explore the potential predictors of the breast feeding and breast diseases. For that reason, the application of the multivariable regression analysis was not achievable. Model calibration was not acceptable. Some of the outcome measures like breast cancer requires

a long follow-up time. This might have affected the lack of statistical differences for this and other conditions. Therefore, the findings from this study should be interpreted with caution.

## Conclusion

The benefits of breast feeding on women health cannot be underestimated despite that our result did not reach statistical significance. Mothers who experience problems during breast feeding should be investigated accordingly. Since cesarean section is a significant factor associated with the non-breast feeding practice, the availability of a trained supportive staff plays a major role in educating mothers (especially young/1<sup>st</sup> time) about the proper breast feeding practice. A large well-designed multicenter longitudinal study is needed to achieve definitive answers particularly for conditions like breast cancer which requires long follow-up time.

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