

# Influence of Hot Compresses Versus Cabbage Leaves on Engorged Breast in Early Puerperium

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## Abstract

Breast engorgement is a common issue affecting breastfeeding initiation and length. There are minimal options for relieving the pain associated with breast engorgement. Therefore, further study of strategies to achieve successful pain relief is crucial to promoting progress in breastfeeding. This study was conducted to evaluate and compare the effectiveness of compressed cold cabbage leaves versus hot compresses among postnatal mothers in relieving breast engorgement. An interventional quasi-experimental study design used to conduct this study. The study was carried out in the postnatal wards of Ismailia & port-Said general hospitals, and Suez Canal University Hospital. A convenient sample study was 60 breast-engorgement postnatal mothers. Tools of data collection were; an interviewing questionnaire sheet included socio-demographic and obstetrical data, Visual Analogue Scale, and Six-point engorgement scale. The results showed that before the intervention, there was no statistically significant difference between the two groups linked to breast engorgement symptoms & body temperature. But body temperature, scores of breast engorgement and pain were statistically significant differentiated between the two groups' pre and post-intervention. Significant improvement in the breast engorgement and pain scales after the intervention was found, ( $p < 0.001$ ). In conclusion, this study revealed that hot compresses and cabbage leaves compresses, as well, for relieving breast engorgement; are time-efficient and easy to perform. However, hot compresses are better than compresses of raw cabbage leaves to minimize discomfort among postnatal mothers and to alleviate breast engorgement. Additional randomized controlled trials with potential placebo treatment should be performed to elucidate the unspecific effects of the application of hot compress and cold Cabbage leaves.

**Keywords:** cabbage leaves, hot compresses, breast engorgement, breast feeding, puerperal women

## 1. Introduction

Engorgement of breasts is a common phenomenon when breast milk first arrives in the breast after three or four days postpartum, accompanied by discomfort, tenderness, and possibly heat. The skin looks a red, shiny, and tight. It is due to a sudden rise in the production of milk, lymphatic & vascular obstruction, and interstitial edema as well due to insufficient breastfeeding. [1-4] Engorgement may be properly handled by emptying the engorged breast or more often holding the baby on the breast. [5, 6] The manual expression can be required to get milk moving at this time. [7,8] Cold packs application on the engorged breast, along with cabbage leaves for approximately twenty-minute to induce milk ejection and minimize breast swelling. [9-12] Hanging breasts & nipples in a pot of warm water and express milk before feeding can reduce pain and causing relaxation the blood vessel; thus opening blood vessels and thus increasing blood flow to the area. [13-16]

Heat's physiological effect is vasodilatation, increases capillary permeability, increases cell metabolism, sedates, increases blood flow to the infected region, introduces antibodies & leukocytes, oxygen nutrients and promotes tissue cure. [17-19] Application of cabbage leaves has been used to reduce tissue pressure by dilating local capillaries, which increases blood flow to and from the area and helps the body reabsorb the accumulated fluid in the breasts. [16, 20]

### *1.1 Significance of the Study*

Pain is the most widely reported explanation for the cessation of breastfeeding in the early postpartum. Breast congestion is a painful issue which can lead to premature weaning. [21] Maternity nurses play a vital role in improving the standard of postnatal treatment that offers awareness and assistance to women who are puerperal. The nurse will also provide health promotion programs including assessment, health education, therapy, and effective action. [22-26] Maternity nurses and midwives also play a significant role in early detection and proactive breast intervention to protect the health of women and improve their active breastfeeding. One of the most critical aspects of midwife intervention is to offer reliable and clear guidance on how to avoid breast-engorgement, and how to treat it to minimize early breastfeeding withdrawal if the issue arises. [21] Few studies have been performed to track the impact of cabbage leaves on breast engorgement with inconclusive and contradictory findings over alternative hot compresses. Through this way, the researchers performed this study, a study on the efficacy of cabbage leaves will help to provide evidence for the implementation of intervention through clinical practice.

### *1.2 Aim of Study*

The research was performed to assess the efficacy of hot compresses and cold cabbage leaves compresses for breast engorgement relief.

### *1.3 Hypothesis*

There would be a significant difference, in breast engorgement relief, between hot compresses and cold cabbage leaves compresses.

## **2. Material and Methods**

### *2.1 Design*

An interventional quasi-experimental study design.

### *2.2 Setting*

The research was carried out in the postnatal ward at Ismailia & port-said general hospital, and Suez Canal University Hospital. The study started from June 15, 2019 to December 15, 2019.

### *2.3 Sample*

A simple study includes 60 breast-engorgement postnatal mothers. The subjects were chosen as following:

#### *2.3.1 The Inclusion Criteria Were Included*

Mothers' ages were 18-45 years and willingness to participate in the study

#### *2.3.2 The Exclusion Criteria Were Included*

An allergy to sulfa drugs and products, current symptoms of breast infection, abscess, mastitis, torn breast skin and bleeding or cracked nipples

### *2.4 The Data Collection Tools*

#### *2.4.1 An Interviewing Questionnaire Sheet Included the Following*

- Age-related socio-demographic details, educational level, family size, and ..... etc.
- Obstetric data of the subject include; gravida, para, and initiation and feeding length.

#### *2.4.2 Measurement Scores of Pain by Using the Visual Analogue Scale (VAS)*

This consists of a 10-cm line with words such as "no pain" and "the worst possible pain" fixed at either end. The line may be either horizontal or vertical. The exact length between zero and the checked point in cm of the section is pain score. [27]

The colored scale developed by the researchers was divided into 3 colors based on the degree of the intensity of pain; green color pointed to mild pain, orange color pointed to moderate pain, and red color pointed to extreme pain that the mother could easily understand.

#### *2.4.3 "Six-Points Engorgement Scale" was Used to Determine Breast Engorgement Degree. [28]*

It contains a score ranges from 1 to 6. Each scoring indicates the following:

“Six-points engorgement scale”	
Score	Description
1	No changes in breast (soft breast).
2	Slight changes in breast.
3	Firm, but no breast tenderness.
4	Firm with starting breast tenderness.
5	Tender & firm.
6	Very tender & very firm.

## 2.5 Methods

### 2.5.1 Ethical Considerations

The responsible authority of the setting gave official permission to the researchers to collect the needed data. The participating women were informed about the intent of the study, and then oral consent was obtained from each participant in the study. The interview was administered to mothers separately, and they were given information sheets.

### 2.5.2 Filed Work

After enrolling, arbitrary groups were split into two equal groups and allocated to two research groups at random. On the three following days, all the management approaches were conducted four times a day. It has been done six times for each subject. Every intervention lasted 30 minutes. Pre/post-intervention scores were measured and reported for breast engorgement and pain.

#### A. Study group (A):

30 mothers given the hot compress applied to the engorged breast, and after 1-2 minutes, the clothes are always replaced. Hot water temperature ranged 43-46°C or 10-18°C as measured by lotion thermometer.

#### B. Study group (B):

30 Mom's got compresses of cold cabbage leaves to alleviate discomfort. For around 20-30 minutes, the cabbage leaves were cooled and placed on the engorged breast; Place Mom's bra over the leaves to keep them in place. Every 30 minutes leaves should be replaced.

### 2.5.3 Analysis of Data

Data entry and statistical analysis are conducted using the statistical software package SPSS 11.0. Statistics included mean, standard deviation, frequency, and percentage descriptive analyzes as well as multiple linear regression analysis.

## 3. Results

Table 1 demonstrated that the mean ages of the participants (studied group 1 and 2); were 30.0±2.15 and 30.0±3.27 years, respectively. With regard to education, in group (A) 53.3 percent of the study population wasn't educated compared with 36.6 percent of group (B). In addition, 66.6 percent were primiparous and 80.0 percent delivered vaginally in group (B) compared to 56.6 percent and 73.3 percent of group (A), respectively.

With regard to the initiation of feeding, the same table explains that in group (A) and group (B) mothers who registered beginning breastfeeding during the postpartum 8-hour period; 16.6% and 20.0%, respectively. According to the frequency and length of the breastfeeding table (1) found that 60.0 percent of Group (A); mothers fed their babies every weeping and 10.0 percent every one hour, compared with 30 percent, 43.3 percent, and 26.6 percent, respectively, in Group (B). Many women (43.3 percent & 53.3 percent) indicated that breastfeeding from each breast is less than 10-30 minutes while mothers (20.0 percent & 16.6 percent) nurse their baby in groups (A & B) for more than 30 minutes, respectively. There's no statistically significant difference between the two groups in any variable.

Table 2 Showed that the breast engorgement symptoms for the study subjects. In the group (A); 96.6 percent & 90.0 percent of mothers complain about dry, painful, and firm swelled breasts, compared to 90.0 percent & 93.3percent in the group (B). While 86.6 percent and 83.3 percent of them reported that breast milk didn't flow in the two groups respectively. Moms with firm & no tender breast were 10.0 percent in the group (A) and 6.6 percent in the group (B)

Table 3 shows that in pre and post-intervention, there was no statistically significant difference between the two groups related to their body temperature. The mean temperatures were  $36.90 \pm 0.31$  &  $36.85 \pm 0.32$  in the group (A) compared to  $36.94 \pm 0.34$  &  $36.80 \pm 0.35$  in the group (B), respectively. The same table showed that  $34.99 \pm 0.71$  &  $34.63 \pm 0.70$  suffered from breast hotness in the group (A); compared to  $34.92 \pm 0.86$  &  $32.91 \pm 0.72$  in the group (B), respectively. Significant improvement in the breast engorgement score, and pain scales post-intervention, ( $p < 0.001$ ) was observed but not in body temperature. There was an average improvement of  $0.51 \pm 0.4$  and  $2.97 \pm 0.2$  in the group (A) while  $3.02 \pm 0.2$  and  $3.45 \pm 0.4$  in the group (B) post-intervention, respectively. Both measures (hot compress & cold cabbage) were effective in decreasing pain and breast engorgement score. Hot compresses have been found to be more effective in relieving pain, hotness, hardness than cold cabbage leaves. Moreover, both used measures were effective in decrease body temperature, however, these improvements weren't significant ( $p > 0.05$ ) as shown in Table 3.

Table 4 Showed that the number of intervention can improve breast engorgement and pain after four times of intervention, mean  $\pm$  SD were  $3.743 \pm 0.205$  &  $4.26 \pm 0.171$  in the groups A & B. The statistics were significant between two groups,  $p = 0.012^*$

Table 1. Distribution of the research subjects according to their general characteristics & breastfeeding

Variables	Study groups				p- value
	Group (A)		Group (B)		
	N	%	N	%	
<b>General characteristics</b>					
<b>Age of mothers</b>					
▪ 18- 25	9	30.0	6	20.0	<b>P &gt; 0.05</b>
▪ 26-35	13	43.3	14	46.6	
▪ 36-45	8	26.6	10	33.3	
<b>Mean X<sup>-</sup> <math>\pm</math> SD</b>	<b>30.0<math>\pm</math>2.15</b>		<b>30.0 <math>\pm</math> 3.27</b>		
<b>Level of Education</b>					
▪ Not educated (Illiterate, or read & write)	16	53.3	11	36.6	<b>P &gt; 0.05</b>
▪ educated (secondary or University)	14	46.6	19	63.3	
<b>parity</b>					
▪ Primipara	17	56.6	20	66.6	<b>P &gt; 0.05</b>
▪ Multipara	13	43.3	10	33.3	
<b>Types of birth</b>					
▪ Vaginal delivery	22	73.3	24	80.0	<b>P &gt; 0.05</b>
▪ Cesarean delivery	8	26.6	6	20.0	
<b>Immediate skin-to-skin contact</b>					
▪ Yes	18	60.0	21	70.0	<b>P &gt; 0.05</b>
▪ No	12	40.0	9	30.0	
<b>Breast feeding characteristics</b>					
<b>Initiation of feeding</b>					
▪ Within 8 hours after delivery	5	16.6	6	20.0	<b>P &gt; 0.05</b>
▪ 9-12 hours	8	26.6	10	33.3	
▪ Above 12 hours	7	23.3	5	16.6	
▪ First day after delivery	10	33.3	9	30.0	
<b>Frequency of feeding</b>					
▪ Every 1 hours	3	10.0	8	26.6	<b>P &gt; 0.05</b>
▪ Every 2 hours	9	30.0	13	43.3	
▪ Every baby crying	18	60.0	9	30.0	
<b>Duration of feeding from each breast</b>					
▪ < 10- 30 minutes	13	43.3	16	53.3	<b>P &gt; 0.05</b>
▪ Every 10- 30minutes	11	36.6	9	30.0	
▪ >10- 30 minutes	6	20.0	5	16.6	

Table 2. Distribution of subjective groups related to symptoms of breast engorgement

Symptoms of breast engorgement	Group (A)		Group (B)	
	No	%	No	%
▪ No tender & firm breast	3	10.0	2	6.6
▪ Tender & firm breast	27	90.0	28	93.3
▪ Hot and painful breast	29	96.6	27	90.0
▪ Non flow of milk	26	86.6	25	83.3

Table 3. Comparison between two groups regarding to body temperature, breast temperature, breast engorgement and pain scores pre & post intervention

Variables	Group (A)		p-value	Group (B)		p-value
	Hot Compresses			Cabbage Leaves Compresses		
	Pre-intervention	Post-intervention		Pre-intervention	Post-intervention	
	Mean ± SD	Mean ± SD		Mean ± SD	Mean ± SD	
▪ Body temperature	36.85 ± 0.32	36.80 ± 0.35	NS	36.94 ± 0.34	36.90 ± 0.31	NS
▪ Breast hotness	34.63 ± 0.70	32.91 ± 0.72	< 0.001*	34.99 ± 0.71	34.92 ± 0.86	< 0.001*
▪ Pain score	3.45 ± 0.4	2.97 ± 0.2	< 0.001*	6.4 ± 1.2	6.1 ± 1.5	< 0.001*
▪ Breast engorgement score	3.02 ± 0.2	0.51 ± 0.4	< 0.001*	5.17±0.7	5.03 ± 0.7	< 0.001*

Table 4. Post intervention breast engorgement scores for two groups regarding number of application

Post intervention breast engorgement scores	Group (A)	Group (B)	t-test	p-value
Number of application	Mean ± SD	Mean ± SD		
1	5.14 ± 0.205	4.22 ± 0.160	0.18	0.288
2	3.48 ± 0.185	4.06 ± 0.158	0.22	0.225
3	3.51 ± 0.189	3.92 ± 0.155	0.42	0.026*
4	3.743 ± 0.205	4.26 ± 0.171	0.52	0.012*
5	3.18 ± 0.178	3.23 ± 0.176	0.1	0.73
6	2.97 ± 0.171	3.03 ± 0.130	0.1	0.6

#### 4. Discussion

Breast engorgement occurs in postnatal mothers in 72 percent to 85 percent. [29] It is described as swelling and breast distention, one of the most common problems that postpartum females face during early breastfeeding. [30-32] For this study, an interventional quasi-experimental design was conducted to evaluate the efficacy of cold cabbage leaves and hot compresses to alleviate postpartum women's breast congestion; the researchers found no statistically significant difference in socio-demographic features and breastfeeding characteristics between two groups. This result is in accordance with the authors' findings that suggested that the two groups were homogeneous for all demographic variables. [33-35]

The present result showed that the immediate skin-to-skin contact in both groups is higher after delivery; these findings were close to those of the study by **Keister et al, (2008)** which found that the immediate skin-to-skin contact between mother and her newborn; and early start of breastfeeding also showed improvement in breastfeeding outcomes. [36] The findings presented were based on a review of relevant literature which explained the degree of congestion typically decreases with each child. Breastfeeding for the first time, mothers sometimes suffer more from engorgement than women who nurse their 2<sup>nd</sup> or 3<sup>rd</sup> infant, as the time it takes for the mature milk to "come in" seems to be shortening for each infant. [37]

This result showed that before implementation, there was no statistically significant difference between the two groups linked to breast engorgement symptoms & body temperature. But for the two groups pre and post-intervention, breasts' temperature, scores of breast engorgement and pain were statistically significant,  $p < 0.001$ . This study is supported by the findings by **Hassan et al., (2020)** and **Snowden et al., (2001)** who clarified that the effects of several interventions to relieve symptoms of breast engorgement among breastfeeding women. [21, 38] However, **Snowden et al., (2001)** found cabbage leaves to be effective in reducing congestion. [38] Because it contains natural mixture of ingredients which helps to decrease tissue congestion by dilating local capillaries in mild, moderate and severe discomfort. [39]

The current research findings showed significant improvements in the pre and post-intervention breast engorgement and pain scales, ( $p < 0.001$ ). This finding is disagreement with **Roberts (2000) & Reiter et al., (2001)**. Chilled cabbage leaves & cold gel packs were stated to be equally successful in reducing breast pressure and pain in postpartum mothers. Where hot & cold compresses in postnatal mothers have been found to be more effective than cold cabbage leaves in relieving breast pressure pain ( $P < 0.001$ ). [40-42] As the warm compress is very safe and provides pain relief and easy express the milk without medication and doesn't have to be concerned about side-effects. [43]

According to a study conducted in Australia to compare the effectiveness of cooled & room temperature green cabbage leaves in the reduction of postnatal mums' breast engorgement and pain. With both conditions, mothers registered less pain, and the majority of mothers preferred cold cabbage leaves. [44] Other studies conducted in Tamil Nadu and the Indian Institute of Medical Science to the effectiveness of the application of cabbage leaves on breast congestion among postnatal mothers have found that the application of cabbage leaves to relieve breast congestion is very successful. [32, 16]

## 5. Conclusion

This study found that cabbage leaves and hot compresses are time-efficient and easy to perform to alleviate breast engorgement. However, hot compresses are better for reducing pain than cabbage leaves compresses and relieving breast engorgement among puerperal women who are breastfeeding.

## 6. Recommendation

The following recommendations are proposed in light of the findings of the present study:

1. This research field requires further effort to extend the evidence base on the different approaches to minimizing breast engorgement in nursing care.
2. Further, elucidate the unspecific effects of applying hot compress and cold Cabbage leaves, additional randomized controlled trials of possible placebo treatment should be performed.
3. Further researches are required to explain the extent of the problem of breast engorgement in Egypt as a whole and to compare rural and urban areas in order to find an effective solution.

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