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Research Article

An Experimental Study to Assess the Effectiveness of Application of Cabbage Leaves on Reduction of Breast Engorgement among Postnatal Mothers in Selected Hospitals of Jabalpur

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I N F O

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A B S T R A C T

Introduction: Amongst the postpartum complications, one of the commonest is breast engorgement. The nurse practitioners' knowledge of alternative and complementary therapy of dealing with engorgements help in reducing this postpartum morbidity and thereby improving maternal and newborn care.

Aim: The study was undertaken to determine the outcome of cabbage leaves' application in reducing breast engorgement.

Method: The study utilised a quasi-experimental research approach with two group pre-test post-test design. The data was collected from selected hospitals of Jabalpur city using purposive sampling technique. The sample comprised 40 postnatal mothers. The tools used for collecting demographic data were an interview along with the analogue pain scale and Hill & Humenic breast engorgement scale. Application of cabbage leaves was done for 20 minutes after breastfeeding for reduction of breast engorgement.

Result: The assessment of the breast engorgement scale in this study was done in control and experimental groups. The pre and post interventional scores of the experimental group were compared. Findings related to the comparison of severity of the breast engorgement score with and without application of cabbage leaves in the control and experimental groups by the unpaired t-test showed t = 3.90 at the 0.05 level of significance, which proved that cabbage leaves are beneficial for the reduction of breast engorgement.

Conclusion: In order to foster MGD 4 and MGD 5, simple and easily available techniques like cabbage leaves application on breast engorgement should be commonised in practice by nurse administrators and midwifery practitioners so that this major discomfort is relieved.

Keywords: Cabbage Leaves, Reduction of Breast Engorgement, Postnatal Mothers

Introduction

Minimal or no engorgement in the first week of postpartum has been associated with sufficient milk, early supplementation, and a higher frequency of breastfeeding decline.[1]

It is well established that cabbage leaves contain sinigrin (allyl isothiocyanate) rapine, magnesium, oxalate, and sulphur heterosides. Sulphur in amino acid methionine in cabbage contains both antibiotic and anti-irritant qualities. It dilates local capillaries and hence reduces congestion in tissues. This results in enhanced blood flow which permits reabsorption of the fluid confined in breast by the body. This in turn helps in relieving the engorgement and inflammation ensuring a free flow of breast milk (Figure 1).[2]

Figure 1.Application of Cabbage Leaves and Immediate Breastfeeding to Relieve Engorgement

In May 2004, Cotterman conducted a study that proved that efficacious breastfeeding needs effective milk transfer through the nipple-areola complex. Resistance in sub-areola tissue enhances during engorgement, as there is competition for space as a result of increased circulation and surplus interstitial fluid with expanding milk volumes. Breast anatomy often gets distorted owing to physiologic and iatrogenic activities. Several mothers get disheartened because of various underlying factors such as latch difficulty, slow milk ejection, reflex, low milk transfer, persistent pain, and nipple injury.[3]

Need of the Study

Studies have revealed that 13.3% of non-breastfeeding mothers suffer from puerperal fever as a result of breast engorgement. Although there are several medications that go well with breastfeeding, minimising the use of medication during breastfeeding is recommended.

The incidence rate of breast engorgement all over the world is 1:8000 and in India, it is 1:6500. Symptoms of engorgement usually appear between days 3 and 5. Two-thirds of mothers get tenderness on the fifth day but some may show tenderness as late as the ninth or tenth day. Two-thirds of women feel at least moderate symptoms. Engorgement reduces if the mother breastfeeds more during the first 48 hours. 20% of postnatal mothers, particularly primigravida mothers, suffer from breast engorgement as early as 0-4 days of the postnatal period.[4]

Looking to both educating mothers and celebrating breastfeeding, UNICEF, WHO, and WABA along with the scientific community strongly advocate beginning breastfeeding within the first hour of birth. Various researches have proved that the early start of breastfeeding can prevent 22% of all fatalities among infants under 1 month in developing countries.[4]

The investigator had observed many mothers who were suffering from breast engorgement during the postnatal period. Maternal complications like mastitis and breast abscess were quite common. This results in the infant being deprived of adequate milk, incomplete emptying of the breast, and sore and damaged nipples with an indirect adverse impact on the infant. Nurses should have knowledge of the treatment of breast engorgement and the resulting complications in order to diminish the pain of mothers. The study was undertaken with the following objectives:

- Assess the level of breast engorgement among postnatal mothers in the control group
- Assess the effectiveness of cabbage leaf application during breast engorgement among experimental group mothers
- Comparison of the breast engorgement score of postnatal mothers in the control group with the experimental group
- Association of the breast engorgement level with selected socio-demographic variables in the control group
- Association of the breast engorgement level with selected socio-demographic variables in the experimental group

Hypotheses (All hypotheses were tested at 0.05% level of significance)

H_1: There will be a significant mean difference between the control group and experimental group in the level of breast engorgement and pain among postnatal mothers.

H_2: There will be a significant association between the breast engorgement score and selected demographic variables in the control group.

H_3: There will be a significant association between the breast engorgement score and selected demographic variables in the experimental group.

Modified Wiedenbach's Helping Art of Clinical Nursing Theory was adopted as the conceptual framework.

Research Methodology

The study utilised a quasi-experimental research approach with two group pre-test post-test design. The data were collected from selected hospitals of Jabalpur city by using purposive sampling technique. The sample comprised 40

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postnatal mothers. The tool used for collecting demographic data was an interview along with the analogue pain scale and Hill & Humenic breast engorgement scale. The application of cabbage leaves was done for 20 minutes after breastfeeding for reduction of breast engorgement in postnatal mothers.

Main Operational Definitions

Application of Cabbage Leaves

In this study, it refers to covering the engorged breast with the appropriate size cabbage leaves for 20 minutes to decrease breast engorgement during the postnatal period.

Use of Cabbage Leaves for Breast Engorgement

- The leaves were rinsed and the stem was carefully cut out so that the leaves might fit entire breasts leaving the nipples uncovered
- Clean cabbage leaves were placed on the breasts. Areola was left uncovered while wrapping the leaves around the breast so that the area around the areola might remain dry and intact

Breast Engorgement

In this study, breast engorgement refers to the disease condition in the mammary glands which results from the expansion of blood vessels and the pressure of new breast milk filled within them and this is assessed by using Storr scale/ Hill & Humenic scale.

Postnatal Mother

In this study, it refers to all the mothers of postnatal period with normal delivery and lower segment caesarean delivery admitted in selected hospitals of Jabalpur without any breast complications.

Criteria for Sample Selection

Inclusion Criteria

Postnatal Mothers

- Who are undergoing normal vaginal delivery
- Who had undergone a lower segment caesarean section
- Who have had a classical caesarean section
- Both primi and multipara mothers

Exclusion Criteria

Postnatal Mothers

- Who were having mastitis and cracked nipples
- Who did not agree to participate in the study
- Who were absent when data were being collected

Validation of the Tool

The prepared tool with statements, objectives, and hypotheses was submitted to ten obstetrics and gynaecology department experts and five other experts. Necessary changes were made as per their suggestions.

Reliability of the Tool

The reliability was calculated by means of split-half method, which measures the coefficient of internal consistency. The correlation was obtained by using Karl Pearson's Correlation Coefficient.

The reliability for visual analogue pain scale was calculated and the obtained value was r = 0.93 which showed that the tool was reliable.

The reliability for breast engorgement scale was calculated and the obtained value was r = 0.93 which showed that the tool was reliable.

Description of the Tool

The tools used in this study were:

Section A: Demographic data of postnatal mothers.

Section B: i. Assessment by visual analogue pain scale.

ii. Six point breast engorgement scale.

Section A: Socio-demographic Data of Postnatal Mothers

A structured interview schedule was used to collect baseline data about socio-demographic variables like age, education, working, socio-economic status, parity of mother, type of delivery, previous treatment for breast engorgement, nature of feeding (both breasts, bottle, frequently by one breast, or not initiated), duration within which breastfeeding was, and is the baby presently with mother, NICU, phototherapy or demised.

Section B

i. Assessment of Breast Pain Intensity

It comprised a visual analogue pain assessment scale to assess the intensity of pain during breast engorgement.

ii. Six Point Engorgement Scale

Developed by Hill & Humenick, this scale was utilised to assess the level of breast engorgement. The score varied from 1 to 6. In this, the researcher rated the breast engorgement level of postnatal mothers. The scoring was done before and after the 9 application of cabbage leaves. Engorgement score increases from 1 to 6 according to the severity of engorgement.

Visual Analogue Pain Scale[5]

The scale has been shown in Table 1.

Breast Engorgement Scale[6]

The score of postnatal women's response to assessment (not questions) was marked as follows:

- Soft breast and without any changes, score as 1
- Slight changes in the breast, score as 2

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- Firm and no tender breast, score as 3
- Firm, and beginning tenderness in the breast, score as 4
- Firm and tender breast, score as 5
- Very firm and very tender breast, score as 6

Engorgement Score

Mild: (1-2); Moderate: (3-4); Severe: (5-6)

Table 1.Visual Analogue Pain Scale

Facial Expression	Score
None	0
Annoying	1-2
Uncomfortable	3-4
Dreadful	5-6
Horrible	7-8
Agonising	9-10

Results

Sociodemographic Characteristics of Participants

Control Group

The findings of the variables showed that out of 40 mothers, maximum (40%) were in the age group of 26-30 years. Most of the mothers (35%) were educated up to the primary level. Majority of them (45%) belonged to a nuclear family. The family income of maximum participants (40%) was below INR 10000. Most of the mothers (45%) were self-employed, and the age for menarche for 65% of the respondents was 11-12 years (35% were 11 years and 30% were 12 years old). 50% of the mothers were primipara. Maximum mothers who faced breast engorgement in a previous pregnancy were 90%, and none of the mothers used cabbage leaves to relieve engorgement. Maximum mothers (65%) had the present mode of delivery as lower segment caesarean section. 45% of the mothers had initiated breastfeeding after 11-15 hours, and most of the babies (75%) were with the mother.

Experimental Group

In the control group, the age of maximum (40%) participants was between 21-25 years. 45% of the mothers resided in urban areas and 35% of the participants were educated up to the senior secondary level. Majority (60%) of the subjects lived in joint families and the family income of maximum participants (55%) was below INR 10000. 60% of mothers were homemakers and the age for menarche for 55% of the respondents was 13 years and above. 55% of the mothers were primipara. Maximum mothers (80%) did not face breast engorgement in a previous pregnancy, and none of the mothers used cabbage leaves to relieve engorgement. Maximum mothers (60%) had the present mode of delivery as lower segment caesarean section. In the case of maximum mothers (55%), breastfeeding was not initiated, and most of the babies (75%) were with the mother.

Comparison of the Pain Scale Scores of Control Group and Experimental Group

The pain intensity of breast engorgement in postnatal mothers of the control group was annoying in 1 (5%) participant, uncomfortable in 6 (30%) participants, dreadful in 7 (35%) participants, horrible in 5 (25%) participants, and agonising in 1 (5%) participant. None of the subjects reported having no pain.

The pain intensity in breast engorgement of postnatal mothers of the post-experimental group was annoying in 4 (20%) subjects, uncomfortable in 8 (40%) subjects, dreadful in 5 (25%) subjects, and horrible in 3 (15%) subjects. None of the participants reported having no or agonising pain (Figure 2).

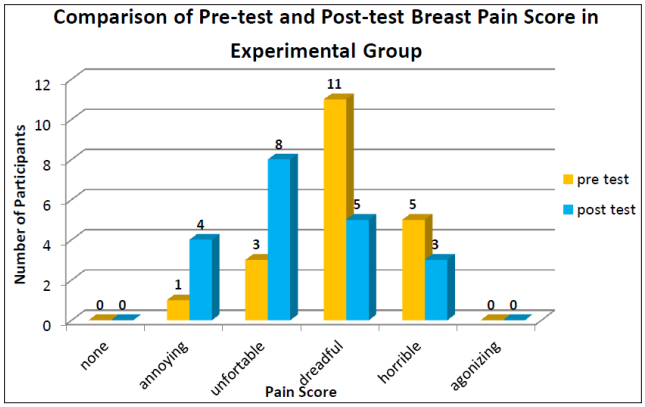

Figure 2.Comparison of Pre-test and Post-test Breast Pain Score in Experimental Group

Thus it was seen that the pain of subjects in the experimental group after the intervention was less than that in the control group (Figure 3). The paired t-test showed the calculated value as 2.974 at 0.05 level of significance.

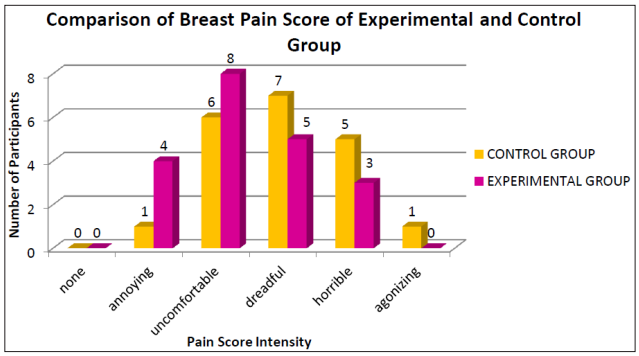

Figure 3.Comparison of Breast Pain Score of Experimental and Control Group

The unpaired t-test showed the calculated value to be 3.47 at 0.05 level of significance, which proved that it is effective.

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Hence H1 was accepted. Comparison of Severity of the Breast Engorgement Score of Control and Experimental Group

Findings of the present study showed that in the control group, 11 (55%) participants suffered from severe engorgement, 8 (40%) suffered from moderate engorgement, and 1 (5%) suffered from mild engorgement (Figure 4).

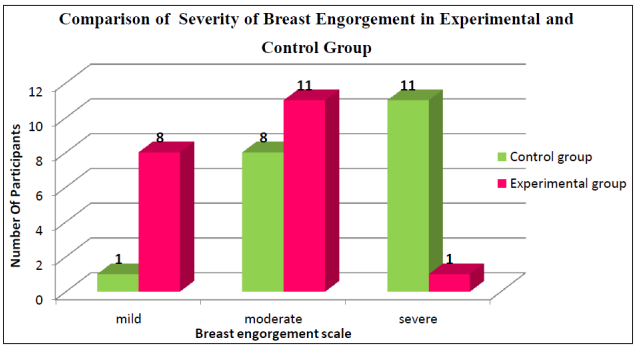

Figure 4.Comparison of Severity of Breast Engorgement in Experimental and Control Group

Findings of the present study showed that 13 (65%) participants suffered from severe engorgement, 6 (30%) suffered from moderate engorgement, and 1 (5%) suffered from mild engorgement in the pre-experimental group.

In the post-experimental group, 1 (5%) participant showed severe engorgement, 11 (55%) showed moderate engorgement, and 8 (40%) showed mild engorgement (Figure 5).

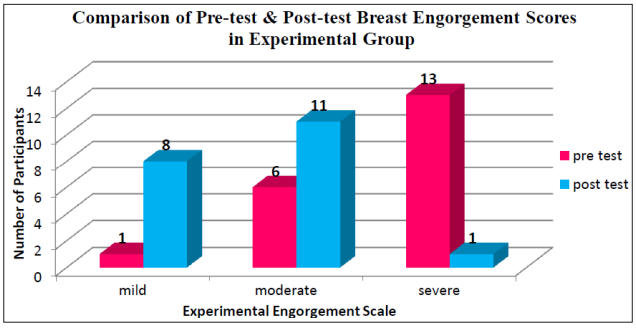

Figure 5.Comparison of Pre-test & Post-test Breast Engorgement Scores in Experimental Group

Thus, it was seen that the severity of breast engorgement in the experimental group reduced after the application of cabbage leaves i.e. in case of severe, it reduced from 11 (55%) to 1 (5%), for moderate, it increased from 8 (40%) to 11 (55%), and for mild, it increased from 1 (5%) to 8 (40%).

On comparison of the results, the t-value was found to be 5.075 at 0.05 level of significance, which was statistically significant.

The unpaired t-test showed statistically significant value, t = 3.90 which was greater than the table value (2.02) at 0.05 level of significance. Hence hypothesis 1 was accepted.

Association of the Level of Breast Engorgement with Selected Socio-demographic Variables

Control Group

Regarding the association of the severity of breast engorgement with demographic variables, age was the most significant in the control group, with chi-square value of 60 and p value of 0 ($p < 0.05$).

The severity of breast engorgement with parity of mother was significant with chi-square value of 13.986 and p value of 0.029 ($p < 0.05$) and the association of the baby being with mother, in NICU or demised had a significant chi-square value of 16.66 and p value of 0.054 ($p < 0.05$). Its association with other variables was found to be non-significant. Hence H2 was accepted.

Experimental Group

In association of severity of breast engorgement with demographic variables, age was the most significant variable in the experimental group with chi-square value of 54 and p value of 0 ($p < 0.05$).

The association of severity of breast engorgement with parity of mother was found to be significant with chi-square value of 12.587 and p value of 0.026 ($p < 0.05$). The association of the baby is being with mother, in NICU or demised had chi-square value of 14.994 and p value of 0.048 ($p < 0.05$). Its association was found to be non-significant with other variables. Hence H3 was accepted.

Discussion

The present study showed cabbage leaf application improves breastfeeding and reduces breast engorgement. A similar study was done by Kharde SN et al. on 30 postnatal mothers with breast engorgement admitted to a hospital in Belgaum using convenient sampling technique. The study found the mean pre-test score (14.86) was more than the mean post-test score (1.33) after using cabbage leaves in cases of breast engorgement. Wilcoxon signed-rank test showed that there was a significant difference between pre- and post-treatment scores ($Z = 4.792$, $p < 0.001$). Hence its results were similar to that of our study.[7]

Our study showed a reduction in the intensity of pain due to the application of cabbage leaves. In the current study, the pain intensity in the pre-test experimental group was found to be dreadful in 35%, annoying in 5%, uncomfortable in 30%, horrible in 25%, and agonising in 5% of the participants. None of the participants reported having no pain. In the post-test experimental group, it was found to be dreadful in 25%, annoying in 20%, uncomfortable in 8%, and horrible in 3% of the participants. None of the

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participants reported having no or agonising pain. The t-test compared result showed a statistically significant change with t value = 3.47 at 0.05 level of significance.

Similar results were seen in a study done by Nikodem VC et al. which showed improvement in exclusive breastfeeding time when cabbage leaf was applied (36 vs 30 days; p = 0.04).[8]

Findings of the present study showed a reduction in breast engorgement after the application of cabbage leaves. 55% of the participants of the control group were found to be suffering from severe engorgement, 40% from moderate engorgement, and 5% from mild engorgement. 65% of the participants in the present study were found to be suffering from severe engorgement, 30% from moderate engorgement, and 5% from mild engorgement in the pre-experimental group. 5% of the participants of the post-experimental group were found to be suffering from severe engorgement, 55% from moderate engorgement, and 40% from mild engorgement.

A similar study done by Witt AN et al. found reduced engorgement in the experimental group with cabbage leaf application as compared to the control group, but the findings were not statistically significant. At six weeks, the experimental group had improved breastfeeding exclusively (p = 0.09) and their mean duration of exclusive breastfeeding was significantly longer than controls (p = 0.04).[9]

The results of a study conducted by Nikodem VC et al. showed that women who applied cabbage leaf showed more improvement in breastfeeding exclusively at 6 weeks. This might have resulted from the advantageous impact of cabbage leaf application, or might be associated with improved mental health, confidence, and self-esteem in these mothers along with cabbage leaf application.[8]

A similar study was conducted by El-Saidy TM et al. where quasi-experimental research design was adopted. The study found that more than 20% of each group (control and experimental) had to endure firm and tender breasts (22.2% & 28.9%). This study showed that both cold cabbage leaf application and warm compresses were helpful in reducing breast engorgement but more improvement was seen in the cold cabbage group.[10]

A study conducted by Prashanth C showed that the cabbage leaves' application was effective in controlling breast engorgement. It also showed a significant association between breast engorgement scores and selected demographic variables of the control group.[11]

The results of a study conducted by Gagandeep et al. showed that the mean score of breast consistency in the experimental group reduced by 1.90 while the mean score in the control group reduced by only 0.80 (p < 0.001). On day 3, tenderness vanished in 86.20% of the subjects in the experimental group as compared to 58.62% of the subjects in the control group. Thus, similar to our study, this study also concluded that the application of cabbage leaves was effective in diminishing breast engorgement.[12]

Conclusion

The study focused on the fact that home remedies are also of great scientific value. Simple measures like cabbage leaves application are very helpful in reducing breast engorgement. Nurses and midwives can use such methods effectively in minimising the complications at the earliest, thereby promoting safe and sound maternal and neonatal care. This research helps in the implementation of MDG 5 for fostering safe and sound postnatal care.

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Conflict of Interest: None

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