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COLD WATER COMPRESS FOR BREAST ENGORGEMENT MANAGEMENT IN A BEREAVED POSTPARTUM MOTHER: A CASE REPORT

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ABSTRAK

Masa postpartum sering disertai dengan engorgement payudara yang menyebabkan ketegangan dan nyeri, terutama pada ibu yang mengalami kehilangan bayi karena produksi ASI berlanjut tanpa pengosongan. Masalah ini menimbulkan penderitaan fisik dan risiko infeksi yang memperburuk kondisi psikologis ibu. Penelitian ini bertujuan untuk mengevaluasi efektivitas kompres air dingin melalui studi kasus pada Ny. A, usia 36 tahun, di wilayah kerja Puskesmas Mojo, Kediri. Metode yang digunakan adalah pemberian intervensi kompres air dingin pada area payudara selama 10 menit, tiga kali sehari, selama 21 hari (5–26 Januari 2025). Hasil penelitian menunjukkan penurunan signifikan pada skala nyeri dari 7 menjadi 1 (reduksi 85,7%), berkurangnya lingkar payudara dari 98 cm menjadi 85 cm (reduksi 13,3%), dan penurunan produksi ASI secara bertahap hingga berhenti pada hari ke-21. Efektivitas ini terjadi melalui mekanisme vasokonstriksi yang mengurangi aliran darah ke kelenjar mammae, sehingga menekan aktivitas metabolik laktasi secara total (*suppression of lactation*). Kesimpulannya, kompres air dingin efektif untuk mengurangi nyeri dan menekan produksi ASI pada ibu postpartum yang mengalami kehilangan bayi.

Keywords: Engorgement payudara; Kompres air dingin; Penekanan laktasi

ABSTRACT

*The postpartum period is often accompanied by **breast engorgement**, causing breast tenderness and pain, particularly in mothers who have experienced infant loss because milk production continues without emptying. This condition creates physical suffering and infection risk, which worsens the mother's psychological state. This study aimed to evaluate the effectiveness of cold water compresses through a case study of Mrs. A, 36 years old, in the working area of Mojo Community Health Center, Kediri. The method applied was cold compress intervention to the breast area for 10 minutes, three times daily, for 21 days (January 5–26, 2025). Results showed significant reduction in pain scale from 7 to 1 (85.7% reduction), decreased breast circumference from 98 cm to 85 cm (13.3% reduction), and gradual cessation of milk production by day 21. This effectiveness occurs through vasoconstriction mechanism reducing blood flow to mammary glands, thereby suppressing lactation metabolic activity (suppression of lactation). In conclusion, cold water compresses effectively reduce pain and suppress milk production in postpartum mothers who have lost their babies..*

Keywords : *Breast engorgement; Cold compress; Lactation suppression*

INTRODUCTION

The postpartum period represents a critical phase lasting approximately 42 days following childbirth, requiring stringent surveillance due to its potential for various health complications (Dewanti & Sari, 2021). One of the most common physical complications during this period is **breast engorgement**, characterized by the accumulation of breast milk and interstitial fluid resulting in breast fullness, hardness, warmth, and pain (Anggelia & Tahun, 2025). This condition typically manifests between the second and tenth postpartum days and may progress to mastitis or breast abscess if inadequately managed (Anjelisa, 2024).

The pathophysiology of breast engorgement involves the sudden increase in milk production coupled with vascular congestion and lymphatic stasis. As milk accumulates within the alveoli and ducts, pressure increases, causing compression of surrounding blood vessels and lymphatic channels. This vascular compromise leads to reduced milk flow, increased capillary permeability, and fluid extravasation into interstitial spaces, creating a cycle of swelling and pain (Alshakhs et al., 2024). The resulting discomfort can significantly impair maternal-infant bonding when breastfeeding is intended, or exacerbate psychological distress when lactation must be suppressed.

Breast engorgement not only inflicts physical suffering through persistent pain and discomfort but also exerts significant psychological impact upon mothers. Chronic pain can precipitate sleep disturbances, fatigue, and increased vulnerability to postpartum depression (Alshakhs et al., 2024). In Indonesia, the prevalence of breast engorgement reaches 10%–20% of the postpartum population, with substantial risk of complications when intervention is delayed (Fairoza & Hafizah, 2025).

Recent case reports from midwifery practice highlight the persistent challenge of breast engorgement management in diverse clinical settings. Gresh et al., (2019) documented a case of severe breast engorgement in a first-time mother where non-pharmacological interventions including cold therapy played a central role in symptom resolution. Such reports underscore the necessity for evidence-based, individualized approaches that can be adapted to resource-limited environments where pharmacological options may be unavailable or declined by patients.

The burden of breast engorgement becomes particularly profound among mothers experiencing **infant loss** or **perinatal bereavement**. In these circumstances, lactation continues physiologically without the physiological

emptying mechanism of breastfeeding or milk expression, resulting in prolonged physical suffering that compounds the grieving process (Islamiati et al., 2024). Without appropriate intervention, persistent engorgement elevates the risk of mastitis, breast abscess, and psychological sequelae including depression and post-traumatic stress disorder (Farlikhatun & Lestari, 2024).

Without appropriate intervention, persistent engorgement in bereaved mothers elevates the risk of acute mastitis, breast abscess formation requiring surgical drainage, and chronic breast pain. Furthermore, the daily physical reminder of lactation without infant represents a **somatic grief trigger**, repeatedly reactivating traumatic memories and impeding psychological healing (Dewanti & Sari, 2021). The intersection of physical suffering and psychological distress creates a unique clinical scenario demanding compassionate, effective, and accessible intervention.

Management of breast engorgement generally encompasses pharmacological and non-pharmacological approaches. Pharmacological methods for lactation suppression include bromocriptine or cabergoline administration; however, these carry adverse effects such as hypotension, dizziness, and considerable economic burden (Fauziah & Nurjannah, 2022).

Conversely, non-pharmacological interventions are increasingly favored due to their safety profile, cost-effectiveness, and accessibility for home-based self-care. Evidence-based non-pharmacological therapies include warm compresses, cold compresses, massage, and cabbage leaf application (Dewanti & Sari, 2021). The physiological rationale for cold compress application in breast engorgement rests upon established cryotherapy mechanisms. Local cooling induces **vasoconstriction** of arterioles and venules, reducing blood flow and capillary hydrostatic pressure, thereby limiting fluid extravasation and edema formation (Farlikhatun, 2024). Concurrently, cold temperature reduces nerve conduction velocity and inhibits nociceptor activation, producing analgesia. At the cellular level, cryotherapy reduces metabolic rate and oxygen demand, potentially diminishing secretory activity of mammary epithelial cells (Anjelisa, 2024).

Cold compress therapy has demonstrated specific efficacy in reducing vascularity, edema, and pain intensity in breast tissue through vasoconstriction mechanisms and prostaglandin inhibition (Farlikhatun, 2024). Research by Anjelisa (2024) demonstrated that cold cabbage leaf compresses and aloe vera gel significantly reduce pain scales and swelling in breastfeeding mothers. Nevertheless, literature remains limited regarding the

application of cold compresses for **total lactation suppression** (*suppression of lactation*) in cases of infant loss, where the therapeutic objective is not facilitating breastfeeding but rather rapidly and comfortably terminating milk production.

Based upon this background, the **objective** of this study was to evaluate the effectiveness of cold water compresses as a non-pharmacological intervention to assist in suppressing milk production among postpartum mothers experiencing infant loss. This study aims to provide scientific evidence for an empathetic, safe, economically accessible, and self-administered midwifery approach for home-based care.

METHODS

his study used a **case report design** with an interventional approach focused on a 36-year-old Mrs. A by providing empathetic midwifery care to assist the process of suppressing breast milk production. The study was conducted in January 2026, starting from postpartum day 3. Ethical approval was obtained from the Health Polytechnic of the Ministry of Health Malang. Written informed consent was obtained from Mrs. A after detailed explanation of the study objectives, procedures, benefits, minimal risks, and the right to withdraw at any time without penalty. Special consideration was given to her psychological condition due to recent infant loss; consent was obtained in a private, supportive setting with adequate time for questions..

The procedure was performed by applying cold water compresses to the breast area for 10 minutes, three times daily, from January 5 to January 26, 2026 (21 days). Cold compresses were applied using clean cotton cloths soaked in water at approximately 15–20°C, measured with a digital thermometer. The cloth was wrung gently until damp but not dripping. Mrs. A was positioned in semi-Fowler position (45° elevation) for comfort. The damp cloth was placed over the entire breast surface, avoiding the nipple and areola region to prevent vasospasm. Each session lasted 10 minutes, performed at 08:00, 13:00, and 18:00 daily. After each session, the breast was gently patted dry with a clean towel. Fresh clean cloths were used for each session.

This activity was carried out in the working area of the Mojo Community Health Center, Mojo Village, Kediri Regency. The data obtained in this case study was primary data collected through interview techniques, physical examinations, and observations on Mrs. A. Secondary data was obtained through recording and reporting from the mother's Maternal and Child Health (MCH) book. Outcome measures included daily

assessment of pain intensity using Numerical Rating Scale (NRS) 0–10, breast circumference measurement, clinical signs of engorgement, and milk production status.

RESULTS

Midwifery care by giving cold water compresses to 36-year-old Mrs. A for 10 minutes, three times daily, showed significant results in suppressing breast milk production and relieving symptoms of breast engorgement. Based on clinical observations and MCH book documentation, the following objective data were obtained

Tabel.1 Clinical Parameters During Cold Compress Intervention

Parameter	Day 3 (Baseline)	Day 7	Day 14	Day 21
Pain (NRS)	7/10 (severe)	3/10 (moderate)	1/10 (mild)	0–1/10 (minimal)
Breast circumference	98/97 cm	94/93 cm	88/87 cm	85/84 cm
Breast temperature	36.8°C (warm)	36.5°C	36.2°C (normal)	36.2°C
Axillary temperature	36.7°C	36.6°C	36.5°C	36.5°C
Erythema	Present (+)	Resolved	Absent	Absent
Milk production	Abundant	Decreased	Minimal	Cessation
WBC	11,200/mm³	Not repeated	Not repeated	Not repeated

Initial Clinical Assessment

Upon first examination on January 5, 2026, Mrs. A appeared distressed and uncomfortable. Both breasts were markedly enlarged, tense, and warm to touch. The skin over the breasts showed a shiny appearance with visible superficial venous engorgement and mild erythema over the outer quadrants bilaterally. Palpation revealed firm, tender breast tissue without any fluctuation or palpable masses. Milk expression was spontaneous and abundant, soaking through her clothing repeatedly.

The patient described continuous pain that radiated toward her axillae, significantly disturbing her sleep and mobility. She rated her pain as severe, and her affect suggested psychological vulnerability appropriate to her recent perinatal loss. When milk leaked, she became tearful, stating that the physical sensation of lactation without her infant present served as a painful reminder of her loss.

Laboratory examination showed mild physiological leukocytosis consistent with the early postpartum period. No evidence of infection was present. Her vital signs remained stable throughout.

Clinical Course and Intervention

Cold water compress therapy was initiated on the day of presentation. The procedure involved application of clean cotton cloths soaked in water cooled to approximately fifteen to twenty degrees Celsius, applied to the breast surface for ten minutes, three times daily. The patient was positioned comfortably in semi-Fowler

position, and care was taken to avoid direct cooling of the nipple and areolar regions.

Early Response Phase

During the first week of intervention, Mrs. A reported gradual symptomatic improvement. The immediate cooling effect provided noticeable analgesia following each application, though the relief was temporary initially. By the fourth day, she noted that the constant pressure sensation had diminished, allowing her to sleep for longer periods. Milk leakage began to decrease in frequency, requiring less frequent changing of breast pads. The breast tissue remained firm but became less tense, and the warmth gradually resolved.

By the end of the first week, pain intensity had decreased substantially from severe to moderate levels. The erythema had completely resolved, and breast circumference measurements showed reduction. The patient began to engage in light household activities, reporting that the physical relief allowed her to focus on emotional healing with her family.

Subacute Phase

Throughout the second week, improvement continued steadily. Pain became mild and intermittent, occurring only with direct pressure or movement. Milk production diminished to occasional droplets, and the patient no longer required protective padding for her clothing. She described feeling that her body was no longer constantly reminding her of her loss through physical discomfort.

Psychologically, she appeared more composed, though appropriate grief responses continued. She expressed appreciation for the simplicity of the intervention, which she could perform independently at home without additional financial burden during a difficult time.

Resolution Phase

During the third week, the frequency of compress application was reduced at the patient's request, as symptoms had become minimal. By the twenty-first day of intervention, clinical examination revealed soft, non-tender breast tissue with normal skin appearance and temperature. Milk production had ceased completely, even with manual expression attempts. The patient reported no discomfort and rated her pain as absent.

Outcome and Follow-up

The twenty-one day course of cold water compress therapy resulted in complete resolution of breast engorgement and successful suppression of lactation. No complications such as mastitis or breast abscess occurred during the intervention period. The patient expressed high satisfaction with the non-pharmacological approach, noting that it provided physical relief while allowing her to avoid additional medications during her grieving process.

A telephone follow-up conducted one week after completion of the intervention confirmed sustained resolution. The patient reported that her breasts remained comfortable with no recurrence of milk production or pain. She had begun grief counseling at the referring hospital and continued to progress through her bereavement with appropriate support.

Tabel.2 Clinical Progression Summary

Time Point	Clinical Status
Day 3 (Initial)	Severe engorgement, abundant milk, significant pain, mild erythema
Day 7	Moderate symptoms, reduced milk leakage, resolved erythema, improved comfort
Day 14	Mild intermittent symptoms, minimal milk production, softening tissue
Day 21	Complete resolution, cessation of lactation, no pain

DISCUSSION

The successful resolution of lactation suppression in this case demonstrates the clinical utility of cold water compress therapy as a non-pharmacological intervention for postpartum breast engorgement following perinatal loss. However, several critical aspects warrant deeper analysis beyond descriptive reporting.

Critical Analysis of Intervention Efficacy

The observed outcomes in Mrs. A's case complete cessation of milk production by day 21, significant pain reduction, and absence of complications, appear favorable when compared to spontaneous lactation involution without intervention, which typically requires one to two weeks longer and carries higher risk of mastitis (Betzold, 2018). Nevertheless, the absence of a control group or comparison arm limits definitive conclusions regarding causality. The natural decline in prolactin levels following delivery, combined with lack of infant suckling stimulation, contributes substantially to lactation cessation regardless of external intervention (Oladokun et al., 2020). The specific contribution of cold compress therapy to the observed timeline remains uncertain without comparative data.

The prolonged duration of intervention raises practical considerations. While Mrs. A demonstrated excellent adherence, this timeframe may present challenges for patient compliance in different socioeconomic or cultural contexts. Pharmacological alternatives such as cabergoline achieve lactation suppression within 48–72 hours (Serrano et al., 2021), though with associated costs and potential adverse effects including hypotension and dizziness. The trade-off between rapidity of action and safety profile requires individualized clinical decision-making, particularly in resource-limited settings where cold compress therapy offers economic accessibility.

Recent randomized controlled trials provide important context for comparing pharmacological and non-pharmacological approaches to lactation suppression. Shoshani et al., (2024) demonstrated that cabergoline (1 mg single dose) achieved superior lactation inhibition compared to pyridoxine (vitamin B6) at days 2 and 7 post-treatment, with lower rates of milk leakage and treatment failure. However, 18% of patients in the pyridoxine group required conversion to cabergoline due to persistent breast pain and engorgement, highlighting that even pharmacological interventions may not provide universal relief. These findings reinforce the value of non-pharmacological adjuncts such as cold compress therapy, particularly in settings where cabergoline is unavailable or contraindicated, or when patients prefer to avoid medication during the grieving process.

Mechanistic Understanding and Biological Plausibility

The therapeutic effects observed likely operate through multiple complementary mechanisms that have been elucidated in recent physiological research. Local cooling induces vasoconstriction of arterioles and venules through activation of transient receptor potential channels, specifically TRPA1 and TRPM8, which mediate sensory responses and blood flow regulation in peripheral tissues (Rosa et al., 2024). This vascular response reduces blood flow to mammary tissue and thereby diminishes delivery of substrates necessary for milk synthesis. The vasoconstrictive pathway involves norepinephrine release from sympathetic nerves and subsequent activation of alpha adrenergic receptors in vascular smooth muscle cells, resulting in sustained reduction of cutaneous blood flow during cooling application (Rosa et al., 2024).

The analgesic effects of cold therapy operate through distinct neurophysiological mechanisms. Experimental studies demonstrate that cryotherapy significantly slows peripheral nerve conduction velocity in both motor and sensory fibers, with reductions of approximately 2 to 2.5 meters per second for every 1 degree Celsius decrease in tissue temperature (Elshiwi et al., 2025). This slowing of signal transmission dampens nociceptive input processing and elevates pain thresholds independently of anti inflammatory effects. Recent randomized controlled trials confirm that localized cold application decreases sensory nerve conduction velocity by 5 to 8 meters per second, accompanied by increased onset latency of sensory responses (Elshiwi et al., 2025).

The optimal duration and temperature parameters for therapeutic cold application remain subjects of ongoing investigation. Current evidence suggests that skin

temperatures in the range of 10 to 15 degrees Celsius are associated with pronounced vasoconstriction, enzymatic suppression, and analgesic effects (Elshiwi et al., 2025). The magnitude of cooling depends on modality type, application time, and anatomical characteristics of the target region, with air based cooling systems demonstrating comparable physiological effects to contact based methods such as ice packs (Elshiwi et al., 2025).

The analgesic efficacy of cold therapy for breast pain has been quantified in recent surgical contexts. Cakmak and Cakmak (2024) reported that cold therapy reduced acute postoperative breast pain and decreased the need for additional analgesics within 24 hours following breast conserving surgery. This evidence supports the biological plausibility of observed effects in postpartum engorgement, suggesting that cold induced vasoconstriction and sensory nerve conduction slowing translate to clinically meaningful pain reduction across diverse breast pain etiologies (Cakmak & Cakmak, 2024).

Global Evidence and Contextual Considerations

International literature presents mixed evidence regarding cold therapy for lactation-related conditions. A systematic review by Mangesi and Dowswell (2020) found insufficient evidence to recommend specific interventions for breast engorgement, though cold applications showed promise for symptom relief. Conversely, studies from low- and middle-income countries have reported favorable outcomes with cold compresses and cabbage leaf applications, likely reflecting the practical necessity for affordable, accessible interventions (Oladokun et al., 2020). Recent experimental studies provide more robust evidence for specific non-pharmacological interventions. Lamadah & Nomani, (2021) conducted a randomized controlled trial comparing chilled cabbage leaves versus cold gel packs for breast engorgement, finding that both interventions significantly reduced pain scores and breast circumference, with no statistically significant difference between modalities. Similarly, Hymas and Stevenson (2022) demonstrated in a randomized clinical trial that both cabbage leaf application and cold gel packs effectively reduced breast engorgement, though neither proved superior to the other (Hymas & Stevenson, 2022). These findings support the interchangeability of cold-based interventions and suggest that patient preference, cultural acceptability, and resource availability should guide clinical selection rather than presumed differential efficacy. Recent systematic reviews provide higher-level evidence supporting cold therapy interventions. Ozkaya and Korukcu (2023) conducted a

systematic review and meta-analysis of randomized controlled trials evaluating cold cabbage leaf application for postpartum breast engorgement, finding significant reductions in both pain severity and breast engorgement scores compared to control groups. This evidence synthesis confirms that non-pharmacological cold applications produce measurable clinical benefits beyond placebo effects (Ozkaya & Korukcu, 2023)

Cultural practices significantly influence intervention acceptability. In some Asian contexts, postpartum women traditionally avoid cold exposure based on beliefs regarding "wind" entry and health restoration (Pemo et al., 2020). Mrs. A's acceptance of cold therapy may not generalize across cultural settings where traditional postpartum confinement practices (e.g., "gejala" in Indonesia, "confinement" in Chinese communities) restrict cold exposure (Pemo et al., 2020).. Mrs. A's acceptance and adherence to cold therapy may not generalize across cultural settings, necessitating sensitivity to traditional practices when recommending this intervention. The absence of cultural barriers in this specific case should not imply universal applicability.

Limitations of This Case Report

Several limitations constrain the generalizability of these findings. First, the single-subject design precludes statistical inference and control for confounding variables. Mrs. A's nulliparous status, gestational age at delivery, and individual physiological characteristics may uniquely influence her response. Second, objective measurement of milk production relied on patient report and manual expression rather than quantitative methods such as test weighing or breast milk volume measurement, introducing potential reporting bias.

Clinical Implications and Future Directions

Despite these limitations, this case contributes to the limited literature specifically addressing lactation suppression following perinatal loss—an underserved clinical scenario where compassionate, non-pharmacological options are needed. Cold water compress therapy offers a safe, inexpensive, and self-administered approach that respects patient autonomy during vulnerable periods.

Future research should prioritize randomized controlled trials comparing cold compress therapy against pharmacological agents and placebo interventions, with standardized outcome measures including milk volume quantification, pain assessment, and psychological well-being. Investigation of optimal cooling parameters: temperature, duration, frequency, and application technique, would enhance protocol

standardization. Additionally, qualitative research exploring patient experiences of physical interventions during bereavement could inform more empathetic, person-centered care approaches.

In conclusion, while this case supports the potential efficacy of cold water compress therapy for lactation suppression and engorgement relief following infant loss, cautious interpretation is warranted given methodological constraints. The intervention represents a reasonable first-line approach in appropriate clinical contexts, with pharmacological alternatives reserved for cases requiring rapid resolution or when conservative measures fail.

CONCLUSION

Cold water compresses may serve as a supportive non-pharmacological approach for managing breast engorgement and facilitating lactation suppression in postpartum mothers experiencing infant loss. In this case, the intervention provided progressive relief of physical symptoms over a three-week period, with complete cessation of milk production and resolution of pain observed by day twenty-one. The mechanisms underlying these effects likely involve vasoconstriction- mediated reduction in mammary blood flow and sensory nerve conduction inhibition, though the specific contribution of cold therapy independent of natural physiological involution remains uncertain.

The accessibility, safety profile, and ease of self-administration make cold water compress therapy a reasonable consideration for clinical practice, particularly in settings where pharmacological options are unavailable, contraindicated, or declined by patients. However, the evidence base supporting this intervention remains limited, with reliance primarily on case reports and small observational studies rather than robust randomized controlled trials. Clinicians should therefore present cold compress therapy as one component of supportive care rather than an established standard of care, with individualized decision-making informed by patient preferences, cultural context, and clinical circumstances.

Future research should prioritize rigorous comparative studies to define the precise efficacy, optimal application parameters, and cost-effectiveness of cold compress therapy relative to pharmacological and alternative non-pharmacological interventions. Until such evidence becomes available, recommendations should remain cautious, emphasizing compassionate, patient-centered care that addresses both physical symptoms and psychological well-being during the vulnerable period of perinatal bereavement.

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