



Best Practice

Evidence Based Practice Information Sheets for Health Professionals

The Management of Nipple Pain and/or Trauma Associated with Breastfeeding

Information Source

This *Best Practice* information Sheet has been derived from a systematic review of research published by the Joanna Briggs Institute entitled "The management of nipple pain and/or trauma associated with breastfeeding: a systematic review".¹ The primary references on which this information sheet is based are available in the systematic review report available from The Joanna Briggs Institute and from the web site:

www.joannabriggs.edu.au

Background

Nipple pain and trauma as complications associated with breastfeeding are considered amongst the most significant factors impacting on breastfeeding in the first weeks of motherhood. The incidence is reported to vary between 34% to 96%; while up to one third of mothers who experience these complications may change to alternate methods of infant nutrition within the first six weeks postnatal.

This Information Sheet Covers the Following Interventions:

Preventing nipple pain/trauma

- Education • Teabag Compress •
- Water Compress • Breast Milk •
- Lanolin • Aerosol Sprays •
- Ointments • Film Dressing •

Treating nipple pain/trauma

- Teabag Compress •
- Water Compress • Lanolin •
- Hydrogel Dressing • Breast Shells • •
- Breastfeeding Technique •
- Ointments •

Breastfeeding is important for the health and development of both the mother and child and provides optimal infant nutrition. A range of views exists on the optimal duration of breastfeeding, however the WHO's global strategy recommends that exclusive breastfeeding is promoted for six months and is continued with complementary foods until two years of age.

Factors that impact on breastfeeding are complex and often inter-related.

Levels of Evidence

All studies were categorised according to the strength of the evidence based on the following revised classification system²

Level I Evidence obtained from a systematic review of all relevant randomised controlled trials.

Level II Evidence obtained from at least one properly designed randomised controlled trial.

Level III.1 Evidence obtained from well designed pseudo-randomised controlled trials (alternate allocation or some other method).

Level III.2 Evidence obtained from comparative studies with concurrent controls and allocation not randomised (cohort studies), case-control studies or interrupted time series with a control group.

Level III.3 Evidence obtained from comparative studies with historical control, two or more single arm studies, or interrupted time series without a parallel control group.

Level IV Evidence obtained from case series, either post-test or pre-test and post-test.

Factors that have been identified include:

- Socio-economic status
- Levels of social support available
- Level of education
- Range of care interventions provided during pregnancy, childbirth and the early postnatal period
- Physical signs and symptoms of nipple pain and trauma.

It is thought that identification and management of underlying causes of

nipple pain may facilitate a better breastfeeding experience and hence support continued use of this mode of nutrition. Additionally patients already enduring painful nipples should have appropriate evidence-based treatments applied to the affected nipple/s.

Objectives

To determine the effectiveness of interventions used by and for breastfeeding women to prevent and/or reduce nipple pain and trauma.

Preventing Nipple Pain/Trauma

Education

An RCT compared standard antenatal education with an additional 30 minutes of one-on-one education for 158 primiparous women within 24 hours of giving birth.³ The woman's positioning and attachment technique was assessed during the education session and on each subsequent day in hospital.

Nipple trauma - No significant differences were found with participants in both groups reporting a degree of nipple trauma (predominantly nipple redness) at all assessment stages.

Nipple pain - Reported to be lower in the treatment group with a statistically significant difference observed between the groups on day 2 and day 3.

Breastfeeding - While no significant differences were found between the two groups at any of the assessment stages

for breastfeeding duration, women in the treatment group who were still breastfeeding at 3 and 6 months were less satisfied with breastfeeding than the control group ($p < 0.03$).

Teabag compress vs water compress vs breast milk vs education

An RCT compared four interventions on 73 primiparous breastfeeding women: instruction only, warm moist teabag compress, warm water compress, and milk massaged into the nipple and air-dried.⁴ All groups were given written and verbal instructions on breastfeeding and the intervention groups were asked to perform their allocated treatment four times a day after breastfeeding. Outcomes were assessed on days one through to seven.

Nipple trauma - No significant difference was found.

Nipple pain - The expressed milk group had the highest mean scores for both pain affect and pain intensity, the warm water compress group had the lowest, although statistical significance was not reported.

Breastfeeding - All groups reported high levels of sucking strength but no correlation was found between sucking strength and pain.

Water compress vs breast milk vs education vs lanolin

An RCT involving 177 primiparous women compared four different interventions, 1. warm water compress,

2. milk massaged into the nipple and air-dried, 3. instruction only and 4. USP modified lanolin⁵

Nipple pain - All groups are reported as experiencing highest pain intensity and affect on day 4. The warm compress group reported the lowest pain intensity and affect on days 7 and 14.

Breastfeeding - The number of women still breastfeeding at 6 weeks were comparable (1. 70.45%, 2. 62.22%, 3. 61.36%, 4. 56.81%).

No single topical agent was found to be more effective than another. The authors state that application of lanolin may not improve outcomes in comparison with warm compresses.

Definitions

LATCH instrument

The LATCH instrument has been found to be reliable and valid in establishing the positioning and attachment of the baby on the breast. It specifically looks at Latch on, Audible swallow, Type of nipple, Comfort and Help.

Hydrous lanolin vs anhydrous lanolin

When referring to the three papers that use lanolin, care needs to be taken as different names are used in each paper. Anhydrous lanolin is known as USP modified lanolin and is also referred to as modified lanolin (medical grade) in comparison to hydrous lanolin which is now discontinued due to concerns about pesticide residues.

Warm compresses vs breast milk vs no treatment

Ninety primiparae women were randomised into three experimental groups.⁶ Group 1 applied warm wet compresses on and around the nipples after breastfeeding four times daily. Group 2 applied expressed breast milk on and around the nipples and let it dry for a few minutes after each breastfeed. Group 3 did nothing but keep their nipples clean and dry.

Nipple trauma - The authors state that there was a significant difference between the groups for cracked nipples favouring group 3, which presented with more cracks on day 1, but from day 2 to day 10 reported fewer cracked nipples. The authors also stated that the duration of cracks was shorter for women in the breast milk group.

Nipple pain - There was no statistical difference in pain scores between the three groups with highest pain scores being reported on day 3.

Lanolin vs breast milk

Twenty three first time breastfeeders were randomised to apply breast milk/colostrum to the nipple of one breast, post breastfeeding and allow it to air dry and apply hydrous lanolin to the other breast post breastfeeding.⁷

Nipple trauma - All the participants reported trauma during the study period, redness within the areola being the most common. The authors reported a positive correlation between nipple trauma and engorgement across both groups ($p < 0.02$), which may

suggest that the nipple is harder to grasp, leading to greater risk of trauma.

Nipple pain - The most intense pain was reported on postpartum day 3 by both groups.

These results should be viewed with caution as the sample size was small and nineteen of the participants had physically prepared their nipples pre birth which may impact on the results. Hydrous lanolin has since been discontinued due to concerns about pesticide residue.

Aerosol sprays

A clinical study where two aerosol sprays were randomly allocated to each breast was evaluated on 200 participants.⁸ The control was a placebo of distilled water and the treatment was Chlorhexidine (0.2%) / alcohol. Participants were instructed to use a brief spray before and after each feed.

Nipple trauma - Both groups showed a significant decrease ($p < 0.01$) in the severity and incidence of nipple trauma from week one to week four.

Nipple pain - Nipple pain improved from week one to four in both groups in those experiencing slight pain (control 36% to 9% and treatment 23% to 0%). Overall discomfort was reduced by a significantly greater extent in the treatment group than in the control group ($p < 0.01$).

Breastfeeding - A total of 49 mothers stopped breastfeeding before the end of the four-week observation period, 18/100 in the chlorhexidine/alcohol group and 31/100 in the control group.

Sore and cracked nipples were given as the reason for discontinuation by 3/18 in the chlorhexidine/alcohol group and 11/31 in the control group. The fall off in breastfeeding was most marked between the third and fourth week.

Aerosol sprays ± ointments vs no treatment

An RCT compared aerosol sprays and/or ointments with the avoidance of any treatment on 219 primiparous and multiparous women.⁹ The women included in the study were randomised to either the control group, which used the existing routine of the ward they were admitted to, or to the treatment group who avoided the use of any physical, chemical or mechanical (shell or shield) method of nipple care in the hospital and after discharge.

Nipple trauma - 34% of participants in the control group experienced some of the characteristics of trauma, ranging from erythema to cracked nipples compared to 27% of the intervention group.

Nipple pain - All participants had some degree of nipple pain. The authors state that the use of a pacifier (at discharge, $p < 0.05$) and the use of a feeding bottle (at two weeks, $p < 0.05$) were associated with a higher incidence of nipple pain.

Breastfeeding - At discharge the majority of infants were breastfed in both groups. However, at two weeks this had already decreased by 17/85 in the control group and 24/111 in the treatment group. The authors report that none of these mothers stopped breastfeeding because of sore nipples.

The results in this study suggest that the use of aerosol sprays may be no better than actually doing nothing.

Film dressing vs no treatment

An RCT involving 50 primiparous and multiparous women evaluated the effectiveness of a film dressing as compared with no treatment.¹⁰ Participants acted as their own controls with breasts randomly allocated to either group. The treatment consisted of the use of a polyethylene film dressing (Blisterfilm) specifically designed for this study.

Nipple trauma - Statistically significant differences were found for total eschar favouring the film dressing group ($p < 0.001$).

Nipple pain - Nipple pain was reported by 94% of the participants across groups. However, discomfort associated with removal of the dressing may be an issue and could account for the likely drop out rate of 16%.

Treating Nipple Pain/Trauma

Teabag compress vs water compress vs no treatment

An RCT compared three interventions, a warm teabag compress, a warm water breast pad compress and no treatment other than allowing the nipple to dry.¹¹ The 65 primiparous women were then randomised to one of three groups: teabag vs water compress, water compress vs no treatment and teabag vs no treatment.

Nipple trauma - The authors state they found no relationship between visible nipple damage and nipple pain.

Nipple pain - The authors found a significant difference in reduction of pain between the two compress groups and the no treatment group, however the water compress and the teabag compress were equally effective in reducing nipple pain.

The sample size in this study was small and to enable conclusive statements to be made further investigation is required. The authors do suggest that teabag compresses should not be used as first choice as they may change the taste and smell of the nipple.

Hydrogel dressing/lanolin and shells

An RCT compared a hydrogel dressing and modified lanolin /breast shells on 42 primiparous and multiparous women who were referred for treatment of sore nipples.¹²

Nipple trauma - Both groups reported a reduction in nipple trauma over the duration of the study ($p < 0.001$).

Nipple pain - Both groups displayed improvements for general nipple pain and nipple pain specific to feeding ($p < 0.001$). Statistically significant reductions were found for feeding pain favouring the lanolin group ($p < 0.05$).

Position and attachment - No statistically significant differences were found between groups, but improvements in breastfeeding technique were observed at follow-up by both groups ($p < 0.001$).

Breastfeeding - Significant improvements were found ($p < 0.001$) in both groups for satisfaction with breastfeeding on follow-up.

Early discontinuation of the study was also forced due to the high incidence of infections in the hydrogel group (7/21, $p < 0.05$).

Breast shells vs no treatment

A quasi-experimental study of twenty women with self reports of early postpartum nipple pain associated with breastfeeding compared insertion of a breast shell over one nipple continuously for four days and no treatment to the other nipple.¹³

Nipple pain - Peak pain intensity was experienced during the first two minutes of feeding and the greatest intensity of pain occurred on day two of the study. This pattern occurred in both treated and non-treated breasts.

Breastfeeding technique vs Mupirocin ointment vs Fusidic acid ointment vs oral Cloxacillin/ Erythromycin

One RCT compared four interventions on mothers with sore nipples, objective evidence of a nipple skin break and a positive Staphylococcus

aureus culture.¹⁴ The women were randomised to receive either: a review of basic breastfeeding technique alone; topical treatment with 2% mupirocin ointment; topical fusidic acid ointment; or oral cloxacillin/erythromycin 500mg every 6 hours for 10 days.

Nipple trauma - At the initial assessment all the mothers had cracked, fissured or ulcerated lesions on their nipples with or without purulent exudate. Nipple cultures revealed that 31% had scant growth of *S. aureus*, 18% had moderate growth and 51% had heavy growth.

Nipple pain - At the initial assessment 7% had mild nipple pain, 63% had moderate nipple pain and 30% had severe nipple pain.

This study had a small sample size and was stopped early due to concern about a high incidence of treatment failure, as evidenced by persistent nipple pain and poor wound healing, as well as the high risk of developing mastitis in the groups not receiving systemic antibiotics.

The risk of developing mastitis was 25% of those not treated systemically compared to 5% of those who were.

Implications for Practice

The following interventions have been used in the clinical area and have implications for practice. Again there is a need for further studies to strengthen these findings as most of the implications are based on single studies.

- Systemic antibiotics have been found to decrease the risk of mastitis developing in women with a positive culture for *S. aureus*. **Level II**
- Film dressings have been found to reduce eschar and nipple pain, **Level II** however low levels of satisfaction were reported with this form of treatment.

Additional points

- The use of pacifiers and feeding bottles has been linked to increased levels of nipple pain. **Level II**
- A positive correlation exists between engorgement and nipple trauma, which may suggest that the nipple is harder to grasp. **Level II**



THE JOANNA BRIGGS INSTITUTE

Recommendations

These recommendations are based on statistically significant findings of the review. There is a need for further studies to strengthen these findings as most of the implications are based on single studies. No studies were identified that addressed the concurrent use of more than one intervention. The factors that influence nipple pain and/or trauma may be best managed by a series of concurrent interventions, however until appropriately designed studies are conducted the effectiveness of both concurrent and single interventions will remain unclear.

Interventions aimed at preventing nipple pain/trauma

- Warm water compresses are recommended for the prevention of nipple pain. **Level II**
- Keeping nipples clean and dry is recommended for the prevention of cracked nipples. **Level II**

Interventions aimed at treating nipple pain/trauma

- Warm water or teabag compresses are recommended for the reduction of nipple pain. **Level II**
- It is recommended not to apply hydrogel dressings due to the high incidence of infections. **Level II**
- Breastmilk massaged onto the nipple post feeding reduces the duration of cracked nipples. **Level II**

References

1. Page, T., Lockwood, C., Guest, K. The management of nipple pain and/or trauma associated with breastfeeding: a systematic review. JBI Reports 1(4), Blackwell Publishing Asia.
2. NHMRC, 1999 A guide to the development, implementation and evaluation of clinical practice guidelines, Canberra, NHMRC.

Acknowledgments

This information sheet was developed by The Centre for Evidenced-based Nursing South Australia (CENSA) a collaborating centre of the Joanna Briggs Institute with a review panel of experts led by Ms Tamara Page, Research Officer – Reviews, CENSA with the assistance of Mr Craig Lockwood, Coordinator Reviews, CENSA and Ms Kylie Guest, Project Officer – Clinical Information, The Joanna Briggs Institute, South Australia.

CENSA would like to acknowledge and thank The Joanna Briggs Institute and members of the review panel whose support, expert advice and commitment to the review proved to be invaluable throughout this activity.

Members of the review panel were:

- Dr Ann Henderson, Lactation Consultant – Women's and Children's Hospital, South Australia.
- Ms Chris McKoy, Director of Nursing – Ashford Hospital, South Australia.
- Ms Margo Canino, Lactation Consultant - Queen Elizabeth Hospital, South Australia.
- Ms Jill Bruce, Lactation Consultant, Flinders medical Centre, South Australia.
- Dr Caroline Lawlor Smith, General Practitioner South Australia.
- Dr Ellen McIntyre, Senior Research Fellow, Department of General Practice, Flinders Medical Centre, South Australia.

In addition this *Best Practice* Information Sheet has been peer reviewed by experts nominated by JBI collaborating centres.

- The Joanna Briggs Institute
Margaret Graham Building,
Royal Adelaide Hospital, North Terrace,
South Australia, 5000
<http://www.joannabriggs.edu.au>
ph: (+61 8) 8303 4880 fax: (+61 8) 8303 4881
- Published by Blackwell Publishing Asia

The series *Best Practice* is disseminated collaboratively by:



“The procedures described in Best Practice must only be used by people who have appropriate expertise in the field to which the procedure relates. The applicability of any information must be established before relying on it. While care has been taken to ensure that this edition of *Best Practice* summarises available research and expert consensus, any loss, damage, cost, expense or liability suffered or incurred as a result of reliance on these procedures (whether arising in contract, negligence or otherwise) is, to the extent permitted by law, excluded”.

This sheet should be cited as:

JBI, 2003 The Management of Nipple Pain and/or Trauma Associated with Breastfeeding, Best Practice Vol 7 Iss 3, Blackwell Publishing Asia, Australia.

References to Included Studies

- Henderson A, Stamp G, Pincombe J. Postpartum positioning and attachment education for increasing breastfeeding: a randomized trial. *Birth* 2001;28(4):236-42.
- Buchko BL, Pugh LC, Bishop BA, Cochran JF, Smith LR, Lerew DJ. Comfort measures in breastfeeding, primiparous women. *JOGGN: Journal of Obstetric Gynecological and Neonatal Nursing* 1994;23(1):46-52.
- Pugh LC, Buchko BL, Bishop BL, Cochran JF, Smith LR, Lerew DJ. A comparison of topical agents to relieve nipple pain and enhance breastfeeding. *Birth* 1996;23(2):88-93.
- Akkuzu, G. and L. Taskin. Impacts of breast-care techniques on prevention of possible postpartum nipple problems. *Professional-Care-of-Mother-and-Child* 2000;10(2):38-39.
- Hewat RJ, Ellis DJ. A comparison of the effectiveness of two methods of nipple care. *Birth* 1987;14(1):41-5.
- Herd B, Feeney J. Two aerosol sprays in nipple trauma. *Practitioner* 1986;230(1411):31-8.
- Centuori S, Burmaz T, Ronfani L, Fragiaco M, Quintero S, Pavan C, Davanzo R, Cattaneo A. Nipple care, sore nipples, and breastfeeding: a randomized trial. *Journal of Human Lactation* 1999;15(2):125-30.
- Ziemer MM, Cooper DM, Pigeon JG. Evaluation of a dressing to reduce nipple pain and improve nipple skin condition in breast-feeding women. *Nursing Research* 1995;44(6):347-51.
- Lavergne NA. Does application of teabags to sore nipples while breastfeeding provide effective relief? *JOGGN: Journal of Obstetric Gynecologic and Neonatal Nursing* 1997;26(1):53-8.
- Brent N, Rudy S, Redd B, Rudy T, Roth L. Sore nipples in breast-feeding women: a clinical trial of wound dressings vs conventional care. *Archives of Pediatrics and Adolescent Medicine* 1998;152(11):1077-82.
- Gosha JL, Tichy AM. Effect of a breast shell on postpartum nipple pain: An exploratory study. *Journal of Nurse-Midwifery* 1988; 33(2):74-77.
- Livingstone V, Stringer LJ. The treatment of *Staphylococcus aureus* infected sore nipples: a randomized comparative study. *Journal of Human Lactation* 1999;15(3):241-6.