ORIGINAL RESEARCH – QUANTITATIVE

Potential predictors of nipple trauma from an in-home breastfeeding programme: A cross-sectional study

Robyn Thompson [a,*], Sue Kruske [b], Lesley Barclay [c], Karin Linden [d], Yu Gao [e], Sue Kildea [e]

[a] Midwifery Research Unit, Mater Research Institute and The University of Queensland, 14 Seves Street, Altona, VIC 3018, Australia
[b] Institute of Urban Indigenous Health, School of Nursing, Midwifery and Social Work, The University of Queensland, QLD 4072, Australia
[c] University Centre for Rural Health, The University of Sydney, NSW 2006, Australia
[d] Darebin City Council, Melbourne, VIC 3072, Australia
[e] Midwifery Research Unit, Mater Research Institute and The University of Queensland, School of Nursing, Midwifery and Social Work, The University of Queensland, QLD 4014, Australia

ABSTRACT

Background: Australian breastfeeding rates fall significantly in the months following birth, often as a result of breastfeeding complications.

Aim: To explore the potential risk factors for nipple trauma and breast engorgement in a group of women who were referred to the in home breastfeeding service in Melbourne, Australia.

Method: A retrospective, cross-sectional analyses of the maternal–infant records ($n = 653$) from 2003 to 2007 including demographic characteristics; pregnancy, labour and birth data; the presenting complications and observational and diagnostic results. Bivariate and logistic regression analyses were conducted to explore the predictors of nipple trauma and engorgement.

Results: Nipple trauma was the most common presenting complication (62.9%). Logistic regression analyses identified four statistically significant predictors: facio-mandibular asymmetry (AOR 4.21, 95% CI [1.25–14.20]), inflammatory mastitis (AOR 2.99, 95% CI [1.57–5.68], nipple malignment (AOR 2.51, 95% CI [1.13–5.55]) and the cross-cradle technique (AOR 1.90, 95% CI [1.03–3.50]). Engorgement was associated with the first postpartum breastfeed being less than one-hour duration (AOR 2.01, 95% CI [1.07–3.79]).

Conclusion: Nipple trauma was associated with commonly taught techniques that involved the cross-cradle hold and manoeuvres of the breast, nipple and baby that resulted in nipple malalignment and facio-mandibular asymmetry. This practice, appeared to interfere with the baby's intra-oral function by restricting movement of the cranio-cervical spine and nuchal ligament. The combination appeared to limit the baby's instinctive ability to activate neuro-sensory mammalian behaviours to freely locate and effectively draw the nipple and breast tissue without causing trauma. Changes to the first and early breastfeeding techniques are recommended.

© 2016 Australian College of Midwives. Published by Elsevier Ltd. All rights reserved.

1. Introduction

There is no question that maternal breast milk is the optimal food for human babies.[1–3] Short and long term benefits have been found in both low and high income countries and include a reduction in infant morbidity including diarrhoea and respiratory infection; infant mortality; obesity; diabetes; childhood leukaemia and higher performance on intelligence tests.[4,5] Additionally there are long term benefits for the breastfeeding woman, which include a reduced risk of type 2 diabetes and breast and ovarian cancer.[5] The World Health Organisation (WHO) recommends women initiate breastfeeding within the first hour of birth and continue exclusive (breast milk only) breastfeeding for six months.[6] Most women initiate breastfeeding, however many discontinue well before six months having experienced difficulties with pain associated with nipple trauma and other breastfeeding complications.[7] The results in an

American cost-analysis showed economic benefits if 90% of babies were breastfeed exclusively for six months. Cost savings would be USD $13 billion a year in paediatric healthcare costs and in excess of 911 preventable infant deaths.[8] When modelling the potential impact of suboptimal breastfeeding rates on maternal disease they found a $17.4 billion USD cost to society.[9]

Australian breastfeeding rates fall significantly in the months following birth. A longitudinal study ($n = 5000$), reported a 92% initiation rate, falling to 80% fully breastfed (no other food or fluid) by the end of the first week.[10] At one month this figure declined to 71%; at three months 56%; only 14% were fully breastfed at six months. Similarly, the Australian National Infant Feeding Survey ($n = 28,759$) indicator results, showed 96% of women initiate breastfeeding and only 15% of babies exclusively breastfeed to five months.[11] The same survey found, the reasons for not continuing breastfeeding in the first six months included women's perception of not having enough breast milk (56%), an unsettled baby (25%) who was not attaching properly (25%) or it was too painful (18%).[11] Although only a small number had never breastfed, having a previously unsuccessful experience was stated as the key reason (38%).

Nipple pain and trauma impact significantly on women's ability to breastfeed in the early postnatal weeks with reports that it effects 34–96% of breastfeeding women; peaking between the third and seventh postpartum day.[12] Nipple pain that continues past the first week is also associated with maternal depression and mood disorders.[13] The anatomy of infant sucking and aetiology of sore nipples was described in the 1980s[14–16] and more recently, an ultrasound study[16] demonstrated an improved understanding of intra-oral function during breastfeeding. Poor 'positioning' and 'attachment' are thought to be major contributors to nipple trauma and pain.[7,13] Additionally, a variety of treatments have been used these include, topical treatments (e.g. antibiotic/antifungal cream, lanolin, peppermint oil), dressings (e.g. warm compresses, hydrogel dressings, tea bags), nipple protection devices (e.g. breast shells), phototherapy and expressed breast milk.[7] However, a Cochrane review assessing the evidence for the various treatments concluded that there was a lack of clear evidence to provide robust recommendations.[7]

1.1. Background to the study

Darebin is a large metropolitan region 20 km north of the city of Melbourne, Australia, encompassing and area of 53 square kilometres. Twenty-one Maternal and Child Health (MCH) nurses (14.7 full time equivalent) who are also registered midwives were employed to provide services out of 11 MCH Centres across the region, to any child under the age of six. The MCH nurses were seeing an increasing number of women requesting breastfeeding assistance. In response to the demand a free, in-home breastfeeding service was designed, developed and delivered, from 2001 to 2007. The purpose of this service was to provide specialist, intensive, in-home support to women who were referred by the MCH nurses to the breastfeeding consultant (Author 1: a registered midwife and MCH nurse with extensive breastfeeding experience). Any woman with a breastfeeding complication was offered the service (we do not have data on the number of women who declined this service). There was no restriction to the number of visits. A database was established and detailed contemporaneous data were collected at each session.

The aim of this paper is to describe the characteristics of a group of women who were referred to the in-home breastfeeding service, to explore the potential risk factors for nipple trauma and breast engorgement, and to illustrate the implications for breastfeeding women, midwifery and MCH nursing practice.

2. Methods

2.1. Study design

A retrospective analysis of specifically designed, contemporaneously collected and recorded data, obtained with consent from a cohort of 653 women was conducted to determine the most common reasons for referral, to explore possible predictors of complications particularly nipple trauma and describe the outcomes for the women who participated. The Australian Catholic University, Human Research Ethics Committee granted a waiver of ethics to use previously collected, non-identifiable data.

During 2001–07 the first author with more than 40 years breastfeeding expertise provided a flexible part-time, specialised in-home service three to four days per week. The MCH nurses were the main referral source for women experiencing breastfeeding difficulties. The in-home appointments, usually 2-hours per session, were planned around the baby's natural waking-to-feed time. This time was important to achieving a relaxed conversation on arrival, to establishing a trusting relationship with the individual mother while planning to meet her needs and familiarise with her environment. The information sharing included relevant discussion about her rights and her consent was sought (and recorded) to record a detailed history and photograph specific trauma. The session included completion of a fully observed breastfeed and contemporaneous recording of the data. A review of her current breastfeeding technique showed that most women had been taught and were using the cross-cradle technique with additional manoeuvres. This led to individualised suggestions that primarily modified the technique to a hands-off approach. At the end of the session the each woman was asked to rate her experience of this one sessional in-home breastfeed by comparing it to previous feeds.

2.2. Data collection tool

A purpose-built database was developed to record detailed data on the women to enable exploration of why so many women were presenting with complications, in particular, nipple trauma. The database, piloted during 2000–02 had minor modifications then remained unchanged from 2003 to 2007. A two-column Excel Spreadsheet was designed to fit the screen of a small hand held Personal Digital Assistant (PDA). The use of a PDA for data collection was beneficial to respectful communication by minimising technological intrusion and permitting concentrated observation while recording during the face-to-face sessions. The database consisted of 18 sections and 12 sub-sections with corresponding sections for free, short-text descriptive notes. Particular observational and diagnostic note was taken of the breastfeeding techniques that women were using.

2.3. Key observational and diagnostic variables

2.3.1. Data

The data included; demographics, maternal characteristics, pregnancy, labour and birth history; breastfeeding history including details about feeding in hospital; presenting complications; observational, diagnostic and photographic data. Several variables identified in the pilot study were commonly associated with nipple trauma, thus descriptors and categories were developed and used to classify common presenting problems and observations outlined below.

2.3.2. Nipple trauma

Due to the specific types of trauma observed and photographed, the nipple was divided into three anatomical areas – the nipple tip,