

**More Milk Sooner Reference List
(updated Jan 9, 2022 Yen)**

RCT demonstrating safety of antenatal hand expression at 36 weeks in a diabetic population

Forster DA, Moorhead AM, Jacobs SE, Davis PG, Walker SP, McEgan KM, Opie GF, Donath SM, Gold L, McNamara C, Aylward A, East C, Ford R, Amir LH. Advising women with diabetes in pregnancy to express breastmilk in late pregnancy (Diabetes and Antenatal Milk Expressing [DAME]): a multicentre, unblinded, randomised controlled trial. *Lancet*. 2017 Jun 3;389(10085):2204-2213. doi: 10.1016/S0140-6736(17)31373-9. PMID: 28589894.

ABSTRACT

Summary

Background: Infants of women with diabetes in pregnancy are at increased risk of hypoglycaemia, admission to a neonatal intensive care unit (NICU), and not being exclusively breastfed. Many clinicians encourage women with diabetes in pregnancy to express and store breastmilk in late pregnancy, yet no evidence exists for this practice. We aimed to determine the safety and efficacy of antenatal expressing in women with diabetes in pregnancy.

Methods: We did a multicentre, two-group, unblinded, randomised controlled trial in six hospitals in Victoria, Australia. We recruited women with pre-existing or gestational diabetes in a singleton pregnancy from 34 to 37 weeks' gestation and randomly assigned them (1:1) to either expressing breastmilk twice per day from 36 weeks' gestation (antenatal expressing) or standard care (usual midwifery and obstetric care, supplemented by support from a diabetes educator). Randomisation was done with a computerised random number generator in blocks of size two and four, and was stratified by site, parity, and diabetes type. Investigators were masked to block size but masking of caregivers was not possible. The primary outcome was the proportion of infants admitted to the NICU. We did the analyses by intention to treat; the data were obtained and analysed masked to group allocation. This trial is registered with the Australian New Zealand Clinical Trials Registry, number ACTRN12611000217909.

Findings: Between June 6, 2011, and Oct 29, 2015, we recruited and randomly assigned 635 women: 319 to antenatal expressing and 316 to standard care. Three were not included in the primary analysis (one withdrawal from the standard care group, and one post-randomisation exclusion and one withdrawal from the antenatal expressing group). The proportion of infants admitted to the NICU did not differ between groups (46 [15%] of 317 assigned to antenatal expressing vs 44 [14%] of 315 assigned to standard care; adjusted relative risk 1.06, 95% CI 0.66 to 1.46). In the antenatal expressing group, the most common serious adverse event for infants was admission to the NICU for respiratory support (for three [$<1\%$] of 317). In the standard care group, the most common serious adverse event for infants was moderate to severe encephalopathy with or without seizures (for three [$<1\%$] of 315).

Interpretation There is no harm in advising women with diabetes in pregnancy at low risk of complications to express breastmilk from 36 weeks' gestation.

Cochrane review demonstrating Breast stimulation appears to reduce the time to delivery and reduce postpartum haemorrhage rates

Kavanagh J, Kelly AJ, Thomas J. Breast stimulation for cervical ripening and induction of labour. *Cochrane Database Syst Rev.* 2005 Jul 20;2005(3):CD003392. doi: 10.1002/14651858.CD003392.pub2. PMID: 16034897; PMCID: PMC8713553.

ABSTRACT

Background: Breast stimulation has been suggested as a means of inducing labour. It is a non-medical intervention allowing women greater control over the induction process. This is one of a series of reviews of methods of cervical ripening and labour induction using a standardised methodology.

Objectives: To determine the effectiveness of breast stimulation for third trimester cervical ripening or induction of labour in comparison with placebo/no intervention or other methods of induction of labour.

Search strategy: The Cochrane Pregnancy and Childbirth Group Trials Register (March 2004) and bibliographies of relevant papers.

Selection criteria: Clinical trials of breast stimulation for third trimester cervical ripening or labour induction.

Data collection and analysis: A strategy was developed to deal with the large volume and complexity of trial data relating to labour induction. This involved a two-stage method of data extraction.

Main results: Six trials (719 women) were included. Analysis of trials comparing breast stimulation with no intervention found a significant reduction in the number of women not in labour at 72 hours (62.7% versus 93.6%, relative risk (RR) 0.67, 95% confidence interval (CI) 0.60 to 0.74). This result was not significant in women with an unfavourable cervix. A major reduction in the rate of postpartum haemorrhage was reported (0.7% versus 6%, RR 0.16, 95% CI 0.03 to 0.87). No significant difference was detected in the caesarean section rate (9% versus 10%, RR 0.90, 95% CI 0.38 to 2.12) or rates of meconium staining. There were no instances of uterine hyperstimulation. Three perinatal deaths were reported (1.8% versus 0%, RR 8.17, 95% CI 0.45 to 147.77). When comparing breast stimulation with oxytocin alone the analysis found no difference in caesarean section rates (28% versus 47%, RR 0.60, 95% CI 0.31 to 1.18). No difference was detected in the number of women not in labour after 72 hours (58.8% versus 25%, RR 2.35, 95% CI 1.00 to 5.54) or rates of meconium staining. There were four perinatal deaths (17.6% versus 5%, RR 3.53, 95% CI 0.40 to 30.88).

Authors' conclusions

Breast stimulation appears beneficial in relation to the number of women not in labour after 72 hours, and reduced postpartum haemorrhage rates. Until safety issues have been fully evaluated it should not be used in high-risk women. Further research is required to evaluate its safety, and should seek data on postpartum haemorrhage rates, number of women not in labour at 72 hours and maternal satisfaction.

“This is interesting and I would like a brief review of the literature to learn more”

This web article by Philippa Pearson-Glaze IBCLC, briefly reviews common questions about antenatal hand expression, with citations.

<https://breastfeeding.support/expressing-colostrum-antenatally/>

“I am a researcher and I want an in-depth review of the literature”

This recent scoping article from Ottawa (2021) consolidates and evaluates the current literature on antenatal hand expression. It is a very helpful document for researchers wanting a full up to date literature review.

Foudil-Bey I, Murphy MSQ, Dunn S, Keely EJ, El-Chaâr D. Evaluating antenatal breastmilk expression outcomes: a scoping review. *Int Breastfeed J.* 2021 Mar 12;16(1):25. doi: 10.1186/s13006-021-00371-7. PMID: 33712049; PMCID: PMC7971107

<https://internationalbreastfeedingjournal.biomedcentral.com/articles/10.1186/s13006-021-00371-7>

Abstract

Background: Antenatal breastmilk expression (aBME) is recommended by some healthcare providers to improve lactation, breastfeeding, and newborn outcomes, particularly for women with diabetes as they face unique challenges with breastfeeding. However, there is limited evidence of the potential harms and benefits of this practice. Our objective was to conduct a scoping review to map the literature describing maternal and newborn outcomes of aBME.

Methods: We searched Medline, Embase, CINAHL, Cochrane Database of Systematic Reviews, British Library E- Theses Online Services (EThOS) database, OpenGrey, and Clinical trials.gov from inception to January 2020. Studies in English that reported on the effect of aBME on maternal and newborn outcomes, and the experiences of women who have engaged in the practice were included for screening. Titles, abstracts, and full-text articles were screened by two independent reviewers. A critical appraisal and clinical consultation were conducted. Key findings were extracted and summarized.

Results: We screened 659 studies and 20 met the inclusion criteria. The majority of included studies (n = 11, 55.0%) were published after 2015, and seven (35.0%) originated from Australia. Ten (50.0%) studies provided data on high- risk obstetrical populations, including those with diabetes (n = 8), overweight or obesity (n = 1), and preeclampsia (n = 1). Commonly reported outcomes included breastfeeding status at discharge or follow-up, mode of delivery, newborn blood glucose, and time to establishing full lactation. Maternal experiences were related to challenges with aBME, confidence and mastery, perceived impact, security and altruism, learning and resources, and physical symptoms as a result of aBME. The critical appraisal demonstrated limited high-quality evidence surrounding aBME.

Conclusions: Our findings demonstrate increasing interest in the safety, efficacy, and acceptability of aBME. Existing studies are heterogenous with variable research questions, outcomes, study designs, and methodology. The recommendations made in this review can be used to help inform future studies evaluating aBME.

**More Milk Sooner: The Value of Prenatal Hand Expression
Reference List
Updated January 9, 2022. (T Yen adapted from A Prollius)**

1. Forster DA, Moorhead AM, Jacobs SE, Davis PG, Walker SP, McEgan KM, Opie GF, Donath SM, Gold L, McNamara C, Aylward A, East C, Ford R, Amir LH. Advising women with diabetes in pregnancy to express breastmilk in late pregnancy (Diabetes and Antenatal Milk Expressing [DAME]): a multicentre, unblinded, randomised controlled trial. *Lancet*. 2017 Jun 3;389(10085):2204-2213. doi: 10.1016/S0140-6736(17)31373-9. PMID: 28589894.
2. Kavanagh J, Kelly AJ, Thomas J. Breast stimulation for cervical ripening and induction of labour. *Cochrane Database Syst Rev*. 2005 Jul 20;2005(3):CD003392. doi: 10.1002/14651858.CD003392.pub2. PMID: 16034897; PMCID: PMC8713553.
3. Singh G, Chouhan R, Sidhu K. Effect of Antenatal Expression of Breast Milk at Term in Reducing Breast Feeding Failures. *Med J Armed Forces India*. 2009 Apr;65(2):131-3. doi: 10.1016/S0377-1237(09)80125-1. Epub 2011 Jul 21. PMID: 27408218; PMCID: PMC4921432.
4. Gionet L. Health at a glance: Breastfeeding trends in Canada (82-624-X) [Internet]. Ottawa (ON): Statistics Canada; 2015 [cited 2020 May 11]. Available from <https://na01.safelinks.protection.outlook.com/?url=http%3A%2F%2Fwww.statcan.gc.ca%2Fpub%2F82-624-x%2F2013001%2Farticle%2F11879-eng.htm&data=04%7C01%7C%7C8882d5abbf2d4076a55508d96ccd60bf%7C84df9e7fe9f640afb435aaaaaaaaaaaa%7C1%7C0%7C637660451614777050%7CUnknown%7CTWFpbGZsb3d8eyJWljiMC4wLjAwMDAiLCJQIjoiV2luMzliLCJBTiI6IjEhaWwiLCJXVCi6Mn0%3D%7C1000&data=Z1wMyNYyBqY%2FNjwG06dEA53sPduBCs3DAikWJjx%2FYi0%3D&reserved=0>.
5. Public Health Agency of Canada. Family-Centred Maternity and Newborn Care: National Guidelines. [Internet] 2019. Chapter 6 (Breastfeeding):6-1.[cited 2020 May 11] Available from <https://na01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.canada.ca%2Fcontent%2Fdam%2Fphac&data=04%7C01%7C%7C8882d5abbf2d4076a55508d96ccd60bf%7C84df9e7fe9f640afb435aaaaaaaaaaaa%7C1%7C0%7C637660451614777050%7CUnknown%7CTWFpbGZsb3d8eyJWljiMC4wLjAwMDAiLCJQIjoiV2luMzliLCJBTiI6IjEhaWwiLCJXVCi6Mn0%3D%7C1000&data=ok%2F16HxGIC6jvRe%2FD1yDTfNJV%2FGkYBPgdiLPOb%2Fsz7c%3D&reserved=0>
aspc/documents/services/publications/healthy-living/maternity-newborn-care-guidelines-chapter-6/maternity-newborn-careguidelines-chapter-6.pdf
6. Ballard O, Morrow A. Human Milk Composition: Nutrients and Bioactive Factors. *Pediatr Clin North Am*. 2013 Feb; 60(1): 49-74.
7. Kramer MS, Kakuma R. Optimal duration of exclusive breastfeeding (Review). *The Cochrane Library* 2009. Issue 4.
8. Eunice Kennedy Shriver National Institute of Child Health and Human Development. [Internet] [Cited 13 May 2020] Available from <https://na01.safelinks.protection.outlook.com/?url=http%3A%2F%2Fwww.nichd.nih.gov%2Fhealth%2Ftopics%2Fbreastfeeding%2Fconditioninfo&data=04%7C01%7C%7C8882d5abbf2d4076a55508d96ccd60bf%7C84df9e7fe9f640afb435aaaaaaaaaaaa%7C1%7C0%7C637660451614777050%7CUnknown%7CTWFpbGZsb3d8eyJWljiMC4wLjAwMDAiLCJQIjoiV2luMzliLCJBTiI6IjEhaWwiLCJXVCi6Mn0%3D%7C1000&data=%2FT0d0dTN3TvxlUz0whMYieoDDd%2FONVMZPnrPqE%2BKs%3D&reserved=0>
9. O'Sullivan TA, Cooke J, McCafferty C, Giglia R. Online Video Instruction on Hand Expression of

- Colostrum in Pregnancy is an Effective Educational Tool. *Nutrients*. 2019 Apr 19;11(4):883. doi: 10.3390/nu11040883. PMID: 31010174; PMCID: PMC6521170.
10. Demirci JR, Glasser M, Fichner J, Caplan E, Himes KP. "It gave me so much confidence": First-time U.S. mothers' experiences with antenatal milk expression. *Matern Child Nutr*. 2019 Oct;15(4):e12824. doi: 10.1111/mcn.12824. Epub 2019 May 23. PMID: 30950165; PMCID: PMC6859991.
11. Fair FJ, Watson H, Gardner R, Soltani H. Women's perspectives on antenatal breast expression: a cross-sectional survey. *Reprod Health*. 2018 Apr 4;15(1):58. doi: 10.1186/s12978-018-0497-4. PMID: 29618359; PMCID: PMC5885364.
12. Johnsen M, Klingenberg C, Brand M, Revhaug A, Andreassen G. Antenatal breastmilk expression for women with diabetes in pregnancy - a feasibility study. *Int Breastfeed J*. 2021 Jul 23;16(1):56. doi: 10.1186/s13006-021-00393-1. PMID: 34301285; PMCID: PMC8299162.
13. Juntereal NA, Spatz DL. Integrative Review of Antenatal Milk Expression and Mother-Infant Outcomes During the First 2 Weeks After Birth. *J Obstet Gynecol Neonatal Nurs*. 2021 Nov;50(6):659-668. doi: 10.1016/j.jogn.2021.07.003. Epub 2021 Aug 14. PMID: 34403651.
14. Juntereal NA, Spatz DL. Integrative Review of Antenatal Milk Expression and Mother-Infant Outcomes During the First 2 Weeks After Birth. *J Obstet Gynecol Neonatal Nurs*. 2021 Nov;50(6):659-668. doi: 10.1016/j.jogn.2021.07.003. Epub 2021 Aug 14. PMID: 34403651.
15. Casey JRR, Banks J, Braniff K, Buettner P, Heal C. The effects of expressing antenatal colostrum in women with diabetes in pregnancy: A retrospective cohort study. *Aust N Z J Obstet Gynaecol*. 2019 Dec;59(6):811-818. doi: 10.1111/ajo.12966. Epub 2019 Mar 19. PMID: 30891743.
16. Soltani H, Scott AM. Antenatal breast expression in women with diabetes: outcomes from a retrospective cohort study. *Int Breastfeed J*. 2012 Dec 1;7(1):18. doi: 10.1186/1746-4358-7-18. PMID: 23199299; PMCID: PMC3538605.
17. Weinel H, Cusack L. Lessons Learned From the Introduction of an Antenatal Human Milk Expression Clinic for Women With Diabetes. *J Hum Lact*. 2019 Nov;35(4):725-728. doi: 10.1177/0890334419836981. Epub 2019 Mar 28. PMID: 30920894.
18. Lamba S, Chopra S, Negi M. Effect of Antenatal Breast Milk Expression at Term Pregnancy to Improve Post Natal Lactational Performance. *J Obstet Gynaecol India*. 2016 Feb;66(1):30-4. doi: 10.1007/s13224-014-0648-7. Epub 2015 Jan 20. PMID: 26924904; PMCID: PMC4755951.
19. Singh G, Dasgupta E. Effect of antenatal expression of breast milk at term to improve lactational performance: a prospective study. *J Obstet Gynaecol India*. 2009 July; 59(4):308-311.
20. Foudil-Bey I, Murphy MSQ, Dunn S, Keely EJ, El-Chaâr D. Evaluating antenatal breastmilk expression outcomes: a scoping review. *Int Breastfeed J*. 2021 Mar 12;16(1):25. doi: 10.1186/s13006-021-00371-7. PMID: 33712049; PMCID: PMC7971107.
21. Foudil-Bey I, Murphy MS, Keely EJ, El-Chaâr D. Maternal and newborn outcomes of antenatal breastmilk expression: a scoping review protocol. *BMJ Open*. 2020 May 12;10(5):e033101. doi: 10.1136/bmjopen-2019-033101. Erratum in: *BMJ Open*. 2020 Jul 30;10(7):e033101corr1. PMID: 32404385; PMCID: PMC7228481.
22. Chapman T, Pincombe J, Harris M. Antenatal breast expression: a critical review of the literature. *Midwifery*. 2013 Mar;29(3):203-10. doi: 10.1016/j.midw.2011.12.013. Epub 2012 Feb 17. PMID: 22342171.

23. Uikey PA, Agrawal P, Khandale S. Antenatal breast milk expression at term increases postnatal lactational performance. *Int J Reprod Contracept Obstet Gynecol*. 2017 Jun;6(6):2438-2443
24. Parker LA, Sullivan S, Krueger C, Kelechi T, Mueller M. Effect of early breast milk expression on milk volume and timing of lactogenesis stage II among mothers of very low birth weight infants: a pilot study. *J Perinatol*. 2012 Mar;32(3):205-9. doi: 10.1038/jp.2011.78. Epub 2011 Sep 8. PMID: 21904296.
25. Parker LA, Sullivan S, Krueger C, Mueller M. Timing of milk expression following delivery in mothers delivering preterm very low birth weight infants: a randomized trial. *J Perinatol*. 2020 Aug;40(8):1236-1245. doi: 10.1038/s41372-020-0688-z. Epub 2020 May 27. PMID: 32461626.
26. da Silva CBM, do Valle BV, de Matos ÚMA, Villarosa do Amaral YND, Moreira MEL, Vieira AA. Influence of different breast expression techniques on human colostrum macronutrient concentrations. *J Perinatol*. 2021 May;41(5):1065-1068. doi: 10.1038/s41372-021-00989-9. Epub 2021 Apr 1. PMID: 33795790.