

Randomized trial comparing the effectiveness of 2 electric breast pumps in the NICU

Summary of Burton P, Kennedy K, Ahluwalia JS, Nicoll R, Lucas A, Fewtrell MS. Randomized trial comparing the effectiveness of 2 electric breast pumps in the NICU. *J Hum Lact.* 2013; 29(3):412-9. doi: 10.1177/0890334413490995.

Key study take-aways

- All preterm infants should receive human milk¹, and this may have to be expressed milk. Every effort must be made to optimize breast pump designs so as to maximize the amount of expressed milk and the efficiency of the process.
- This study concluded that the breast pumps in question performed equally in terms of effectiveness of milk expression and maternal opinions; however, pump design may have an impact on the proportion of infants breastfeeding at time of NICU discharge.

Background and study rationale

It is well known that preterm infants need human milk^{1,2} to thrive but many are too weak to breastfeed, leading to a reliance on expressed milk. As most neonatal intensive care units (NICU) recommend the use of a double electric breast pump, this randomized, controlled trial was conducted to compare the effectiveness of the Medela Symphony Pump (Pump S) versus

the novel Philips Avent twin electronic breast pump (Pump A) in the NICU.

Methods

The study was conducted in two UK NICUs, where Pump S was the default pump. The study had ethics approval from the UCL Institute of Child Health ethics committee, and was registered at www.ClinicalTrials.gov (NCT00887991).

Inclusion criteria: babies born <34 weeks gestational age and <72 hours old at randomization, expected to stay in the NICU for at least 10 days and with mothers planning to express milk.

During the 10-day study period, 36 mothers were randomized to use Pump A and 35 to use Pump S. They recorded various variables such as weight of expressed milk, and start and end time of milk expression. On Day 10, mothers completed a perception questionnaire on pump parameters. A physiological test was also performed during a single 15-minute breastfeeding session between Days 3-10, with the milk weighed at 1-minute intervals.

Results

Primary outcomes

Initial 10-day study period:

- No significant difference between randomized groups in total weight of expressed milk.

Physiological test:

- Total weight of expressed milk was significantly greater and time taken to produce specific volumes was significantly less for mothers using Pump S.
- Non-significant trend for target weights to be reached more quickly by mothers using Pump S, with a significant difference for the first appearance of milk and for 5 g of milk.

Secondary outcomes

Initial 10-day study period:

- No significant difference between randomized groups in total number of pumping sessions, time spent expressing or efficiency of expressing.
- Pump A received significantly better scores than Pump S for "location of control button" and "ease of use".

Analyses beyond 10-day study period:

- No significant difference between groups in the total volume of milk expressed in the NICU, volume of milk expressed and fed to infant, time taken for infants to reach full enteral feeds, or the median volume of milk expressed per day.
- Significant association between pump and whether or not mothers were breastfeeding their infant(s) at the time of NICU discharge (21/29 of group A mothers versus 8/21 group S mothers).

Conclusions

The proportion of infants in this study receiving breast milk at discharge and the volumes received during the hospital stay were not significantly different between the pump groups in the initial 10-day study period or until discharge from the NICU (although pump S performed better during the physiological test). However, mothers randomized to pump A were significantly more likely to be directly breastfeeding their infant (although the relatively small sample size did limit confidence in the size of the effect). Even though the reasons for this are unclear, the finding of a greater likelihood of breastfeeding at NICU discharge is an important outcome that requires further study.

References

1. American Academy of Pediatrics, Section on Breastfeeding. Policy statement: breastfeeding and the use of human milk. *Pediatrics* 2012;129(3):e827-e84.
2. Agostoni C, Buonocore G, Carnielli VP, et al. Enteral nutrient supply for preterm infants: commentary from the European Society for Paediatric Gastroenterology, Hepatology, and Nutrition Committee on Nutrition. *J Pediatr Gastroenterol Nutr* 2010;50(1):85-91.

