Infant & Toddler Feeding Case Files
嬰幼餵哺檔案
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Exclusive Breastfeeding Without Suckling: Exclusive Pumping

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Case History

Elaine is a 28-year-old healthy housewife living with her husband and mother-in-law. She gave birth to her first baby, Alex, at full term with a birth weight of 3.5 kg by normal vaginal delivery at a public hospital. Alex was admitted for phototherapy because of neonatal jaundice at 6 days of life. Due to infection control measures of the COVID-19 pandemic, Elaine could not breastfeed Alex directly nor feed him with expressed breastmilk (EBM). She had to keep expressing and storing up the EBM in the refrigerator. Unfortunately, after returning home, Alex was reluctant to suckle. When breastfeeding, he often slept on her breast but woke up frequently to demand feeding. Elaine's breasts were full after nursing. She was very frustrated and struggled to maintain the milk supply. At the same time, she was urged by family members to bottle-feed Alex to gauge how much he had taken. Elaine finally decided to boost up her breastmilk after reading about "powerful pumping" on the web. She topped up the pumping in repeated cycles of 15 – 20 minutes lasting about 2 hours a day and continued for a week. Finally, she managed to feed Alex exclusively with EBM. She pumped her breast 6 to 7 times a day, producing 100ml each, despite repeated sore nipples and on-and-off breast pain with pumping.

About 2+ weeks postpartum, Elaine developed high fever and breast engorgement. She attended the Accident and Emergency Department (AED) and was prescribed antibiotics. She recovered a week later.

Around 5 weeks postpartum, Elaine developed another episode of high fever, sore nipples, and left breast pain for 2 days. She attended AED again and was admitted to the surgical ward for left mastitis. Assessment by the lactation consultant revealed she was not confident in breastfeeding Alex directly. Besides, she perceived herself as having inadequate milk although Alex had already gained 1.5kg by one month of age. She had stored 8 bags of EBM and was determined to pump as much as possible to ensure adequate reserve in case he demanded more later. She was worried about adverse drug effects on Alex. As suggested by her friends and mother-in-law, she planned to continue pumping but discard the milk as long as she needed medication for her mastitis. Examination revealed sore nipples with blisters. Both breasts were full and lumpy with inflammation in the left breast. Her pumping was problematic. She had used the strongest suction force and an under-sized breast shield. Both were likely the culprits of her repeated sore nipples and blocked ducts. The lactation consultant counselled on her various misbeliefs as well as proper pumping suction and schedule, using a shield with a larger flange to avoid traumatisation and over-stimulation. She was encouraged to breastfeed directly after discharge. As Alex was not present, key points on optimal attachment were explained.

At 6 weeks postpartum, Elaine attended a follow-up session at the lactation clinic. Her symptoms subsided completely. The lactation consultant encouraged her to breastfeed Alex directly and discussed with her further information on transition to direct breastfeeding.

At 8 weeks postpartum, Elaine brought Alex to the lactation clinic. His body weight increased by another 1.2kg in the past one month while he was still taking EBM exclusively. Elaine pumped 6 times a day, yielding 150ml each. She was still unconfident about breastfeeding Alex directly because of her past unpleasant experience and preference for bottle-feeding among family members. The lactation consultant coached her on proper positioning and attachment. She was amazed that her nipples did not hurt. Her breast was soft after effective suckling by Alex, who was contented after the feed. She regained her confidence in direct breastfeeding. The lactation consultant further counselled her on the benefits of direct breastfeeding and potential risks of exclusive pumping.

The phone follow-up session at 12 weeks postpartum revealed that Elaine was breastfeeding Alex directly and exclusively, without any pumping. She very much enjoyed the loving relationship especially when breastfeeding Alex directly.

Discussion

Lactating mothers express their breastmilk for a variety of reasons. The common ones are initiating milk production or maintaining milk supply during transient separation from the baby because of maternal or the baby's health issues; resuming work; breastfeeding difficulties, etc. Expressing breastmilk to improve milk removal is also indicated in milk stasis conditions.

In Hong Kong, there is an increasing prevalence of breastfeeding in healthy full-term infants, either by way of direct breastfeeding or feeding with EBM. The commonest reason for expressing breastmilk within the first 2 to 3 months postpartum was breastfeeding difficulties and returning to work.[1] However, pumping without direct breastfeeding is associated with a shorter duration of breastfeeding and earlier introduction of formula feeding.[2]

Bottle Feeding with Expressed Breastmilk Has Higher Risks[3-6]

Studies have shown bottle-feeding with EBM, as compared with direct breastfeeding, has higher risk of otitis media, respiratory infection, asthma, overweight and obesity.

Gut Microbiota in Expressed Breastmilk vs Direct Breastfeeding[2, 7-9]

Gut microbiota is crucial for the development of the immune system in infants whose gut microbiome can be enhanced through direct breastfeeding especially when the baby is nursed skin-to-skin. However, many mothers perceive feeding EBM to a baby the same as direct breastfeeding. Studies have shown that bacterial contamination is more common in EBM from breast pump than that by hand expression. **Pumped breastmilk is associated with increased gram-negative bacteria such as E. Coli and Salmonella, and depletion of bifidobacterium** (one of the major genera of bacteria making up the gastrointestinal tract microbiota).

Components in Stored Expressed Breastmilk[10-13]

Studies have shown that cortisol level is higher in EBM collected in the morning while melatonin level rises in the evening and peaks in the early morning hours. Melatonin fosters sleep and relaxes digestion. Besides, daytime milk has higher levels of immune factors. A circadian clock controls rhythm in sleep-wake cycles, respiratory rate, body temperature, digestion, and metabolism. Direct feeding from the breast matches maternal circadian rhythms and thus communicates the time of a day to the baby. However, **EBM may not be circadian-matched**.

Vitamin C can be reduced by one third after 24 hours of refrigeration. Calorie and fat content as well as antioxidant capacity decrease with duration of freezing. Some photo-sensitive nutrients degrade when breastmilk is stored in transparent containers allowing light exposure.

Rancid flavours and odours of stored breastmilk may occur with prolonged storage due to the normally present lipase in breastmilk, breaking down the fats. In case a baby refuses thawed milk, mothers may try providing fresh EBM or that frozen for less than 7 days.

Flange Size and Milk Pump

Understanding the impact of a pump on the breast or nipple tissue can help improve the pumping experience and breastfeeding outcomes. The pumping action can cause swelling, or traumatisation of tissue inside the tunnel if too strong a suction force is applied. A well-fitting flange should have adequate room to accommodate tissue distension in order to avoid rubbing during pumping. Soreness and abnormally enlarged and lengthened nipples persisting after pumping indicate soft tissue injury.

If a flange is too small, the nipple cannot go in and out of the tunnel freely but rubs against the wall, causing abrasions. If an over-sized flange is used, apart from less effective suction, milk ducts within the areolar may be drawn inside the tunnel, causing compression. This may lead to incomplete milk removal and blocked duct may occur. From the author's experience, **a flange tunnel allowing a rim of 3-5mm away from the nipple before pumping and 1-2mm after pumping is recommended**. Some mothers may need to try different-sized flanges to fit their breasts. Hand expression can also be considered when encountering sore nipples or when milk let-down is not apparent.

All milk pumps have their life spans. Some mothers may borrow or purchase a second-hand pump. Some pumps may not be functioning normally, e.g., ill-fitting parts causing leakage, defective motor with ineffective suction, etc. Pumps with open system (breastmilk may come in contact and be retained inside the pump) impose a risk of cross infection.

Cleansing a pump is important especially for hospitalised babies. Mothers should discuss with healthcare professionals on how each procedure (e.g., sterilization of milk bottles, storage and handling of EBM) is done to prevent contamination. Moisture in the tubing should be got rid of and parts of the pump thoroughly cleansed by swinging the tubing and/or running the pump for several minutes to prevent growth of bacteria and mould.

More support is needed for Mothers Feeding EBM

Mothers adopting exclusive pumping need extra support. They can be emotionally stressed with physical and mental fatigue. Some may feel being negatively judged for not breastfeeding the baby directly. It is crucial to be empathetic and patient to listen to their discourse and support their informed choice of infant feeding. Strengthened education on breastfeeding and enhanced support are required for mothers to sustain feeding EBM exclusively.

The successful transition from pumping to direct breastfeeding, while effortful, is imperative in achieving exclusive and sustained breastfeeding. Extra patience and step-by-step guidance from experienced healthcare professionals on optimal attachment and positioning are essential.

Key Messages:

1. Compared with direct breastfeeding, bottle-feeding with expressed breastmilk imposes higher risks.
   相對直接授乳，以奶瓶餵哺母乳有較高的風險。

2. Expressed breastmilk is not equivalent to breastmilk suckled directly from the breast.
   擠出的母乳並不等同直接吸啜的母乳。

3. Mothers pumping improperly would have sore nipples and blocked ducts. Ensuring their proper use of the pump and selection of appropriate-sized flange is crucial.
   不正確泵奶的媽媽會有乳頭破損及乳管淤塞的情況。確保她們明白怎樣正確使用泵奶器和選擇合適的喇叭十分重要。

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