COMPARISON OF BREASTMILK PRODUCTION FROM MOTHERS OF PREMATUREAND MATURE BABIES DURING THE FIRST WEEK IN NICU SILOAM HOSPITALS KEBON JERUK

Oleh:

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Abstract

Background: The principal goal for infants especially preterm is the provision of the mother's own milk (MOM), but on the other hand it is difficult to get MOM for preterm babies due to delayed of lactogenesis II and mother's stress. Milk production and adequacy, for mothers of both healthy breastfeeding term infants and non-nursing preterm infants, have been shown to have a significant relationship with milk production 4-6 days after birth. This research aim to describe the comparison of milk production between mothers of premature and mature babies during the first week in NICU SHKJ.

Methods: This is an observational descriptive with comparative study of mother's milk production of preterm (<37 weeks) and term (≥37 weeks) babies during the first week of life in NICU Siloam Hospitals Kebon Jeruk from 1st January until 31st December 2018. We documented the milk production from mothers breastmilk expression every 3-4 hours since 4-6 hours after delivery until day 7.

Results: From 181 babies during 2018, we got 31 preterm and 77 term babies that we could documented from birth until day 7. The average breastmilk production of the preterm vs term mothers in each expression from day 1-7 were 0,81 vs 1,61 ml; 3 vs 3,65 ml; 6,66 vs 6,94 ml;
21,5 vs 26,6 ml; 34,1 vs 46,4 ml; 45,92 vs 46 ml; 48,88 vs 50,4 ml/x expression.

Conclusions: Expressing milk for a preterm or unwell baby requires commitment by the mother and effective support from staff. Commence breast milk expression as soon as possible after birth, at least within the first six hours, followed by frequent, regular and effective breast milk expression to stimulate adequate breast milk production may provide MOM for babies even forpreterm babies in NICU with almost similar amount.

Keywords: Breastfeeding, mothers own milk, milk expression, NICU

Introduction

Human milk is considered the best nutrition for new-born infants because it provides substantial nutritional, cognitive, emotional, and immunologic benefits for the infant.[1,2] Breastfeeding confers protection against gastrointestinal infections, respiratory infections, otitis media, allergic diseases, reduces risk of Suddent Infant Death Syndrome (SIDS) and it is also associated with a reduced long term risk of diseases such as inflammatory bowel disease (IBD), celiac disease, obesity, diabetes, leukemia and lymphoma.[3-8] The protective role of human milk seems to be the consequence of a synergistic action of the wide range of health-promoting components such as carbohydrates, nucleotides, fatty acids, immunoglobulins, cytokines, immune cells, lysozyme, lactoferrin and other immunomodulatory factors.[9-12] All of the benefits of human milk are magnified in the preterm infant as it protects against a multitude of NICU challenges.[2,13] Early breast milk, known as colostrum, provides immune benefits to infants, offering potential risk reduction for nosocomial infection, sepsis and necrotizing enterocolitis (NEC).[14] It lowers the mortality rates, decrease length of hospital stay and long-term growth failure and improves feeding tolerance. Other benefits include a decreased readmissions after NICU discharge and maternal psychological benefits.[15-20] Long- term studies also suggest that human milk feeding in NICU is associated with greater neurodevelopmental outcomes, lower rates of severe Retinopathy of Prematurity (ROP), metabolic syndrome, blood pressures and LDL concentrations and improved leptin and insulin metabolism.[8,21,22]

Several studies indicate that immunoprotective factors are more highly concentrated in the colostrum of mothers who deliver preterm infants than those who give birth at term.[23,24] Provision of colostrum is recognized as oral immune therapy (OIT) and is valuable to all NICU infants unable to feed orally including extremely low birth weight (ELBW; BW<1000g) infants.[25,26] During this intervention, a small amount of colostrum is placed directly onto the oropharyngeal mucosa for absorption.[27] In theory, the abundant immune factors in colostrum interact with lymphoid tissues in the oropharynx and stimulate the immature neonatal immune system.[28]

Mothers of preterm infants experience physiological and emotional challenges, which may adversely affect breast feeding outcome.[29] The reasons are:

- mammary growth may be incomplete;
- decreased exposure of mammary epithelium to prolactin, cortisol, and other hormones that normally occur during a full-term pregnancy ;
- poor placental function with low levels of placental lactogen.[30]

Maternal stress and several causes underlying preterm birth (eg, hypertension, diabetes, and maternal obesity) have been associated with delayed lactogenesis II, which begins with the production of copious amounts of breastmilk following delivery.[20,30-33] These mothers start and sustain breast feeding at lower rates than mothers of term babies.[30] A delay in lactogenesis stage II also common in term infants, especially if initiation of breastfeeding is delayed following delivery.[34] However,

some mothers seem to achieve compensatory growth by the adoption of a frequent milk expression schedule in the early postpartum period.[29,35,36] The first milk expression should take place as soon as possible (within 1 hour) following delivery.[36-38] The amount produced can be as little as a few drops of colostrum at each expression for the first 24–48 hours post partum. Mothers should be encouraged to express at least eight times in 24 hours.[39] Milk production and adequacy (defined as greater than 500 ml/ day), for mothers of both healthy breastfeeding term infants and non-nursing preterm infants, have been shown to have a significant relationship with milk production 4–6 days after birth.[28,40] Because of the abundance benefit of breastmilk for babies especially in NICU, we want to report the use of MOM and compare the breastmilk production from mothers of preterm and term babies in our NICU.

Material & Methods

This is an observational descriptive with comparative study of mother's milk production of preterm (<37 weeks) and term (≥37 weeks) babies during the first week of life in NICU Siloam Hospitals Kebon Jeruk from 1st January until 31st December 2018. We have admitted 181 patients in NICU during 2018 consist of 43 preterm and 138 term babies, but we can only documented 31 samples from preterm and 77 samples from term babies. The uncomplete breastfeeding documentation was due to not all the babies were born in our NICU, so they were reffered from other hospital not at the first day of life. Another reasons were mom didn't express breastmilk regularly eventhough we already encourage them to do so or administration mistakes by NICU staff.

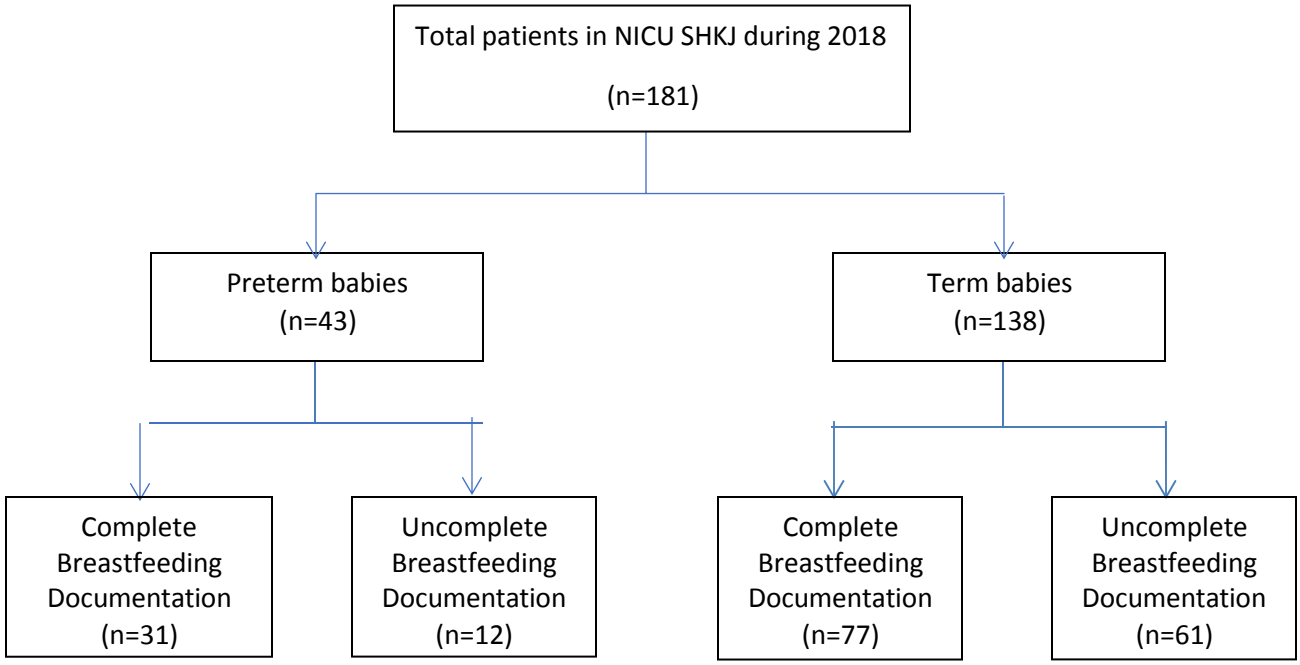
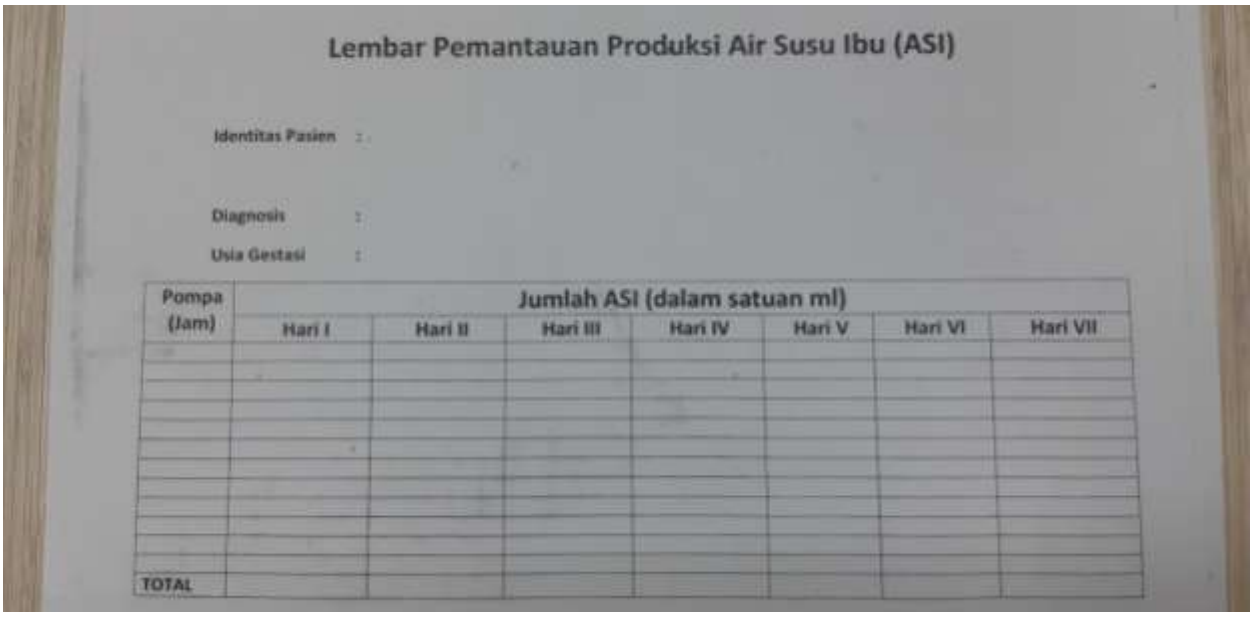


Figure 1. Sampling design

We encourage all mothers in our NICU to express MOM. If they were give birth in our hospital, our policies is to express breastmilk after 4-6 hours of delivery. We teach the parents to wash hands before expressing breastmilk and how to express breastmilk with hands (using syringe) or breast pump. Then, we try to get breastmilk expression every 3-4 hours, collect the data for 1 week (from colostrum until day 7 everyday) and fill the amount of breastmilk in the form below:


Lembar Pemantauan Produksi Air Susu Ibu (ASI)

Identitas Pasien :

Diagnosis :

Usia Gestasi :

Pompa (Jam)	Jumlah ASI (dalam satuan ml)						
	Hari I	Hari II	Hari III	Hari IV	Hari V	Hari VI	Hari VII
TOTAL							

Figure 2. Breastmilk production documentation form

Results

The characteristic of our samples are shown in the table below:

Table 1. Sample Characteristics

	Preterm Babies		Term Babies	
	n=31	%	n=77	%
Gestational Age				
<32 week	4	12,9		
≥32 -35 week	15	48,4		
≥35 -37 week	12	38,7		
≥37 week			77	100

Number of Pregnancies				
G1	19	61,3	37	48
G2	8	25,8	24	31,2
G3	4	12,9	12	15,6
≥G4	0	0	4	5,2
Delivery Method				
Vaginal Delivery	4	12,9	16	20,8
Vacuum Extraction	0	0	1	1,3
Caesarean Section	27	87,1	60	77,9
Baby Gender				
Boy	18	58,1	47	61
Girl	13	41,9	30	39
Birth Weight				
1000 - <1500 g	5	16,1	0	0
1500 - <2500 g	21	67,8	6	7,8
2500 - <4000 g	5	16,1	67	87
≥ 4000 g			4	5,2

We calculate the average amount of breastmilk produced by each mom everyday then we differentiate the average from all preterm compare to term babies from day 1 until day 7 of birth. The chart is presented in figure 3.

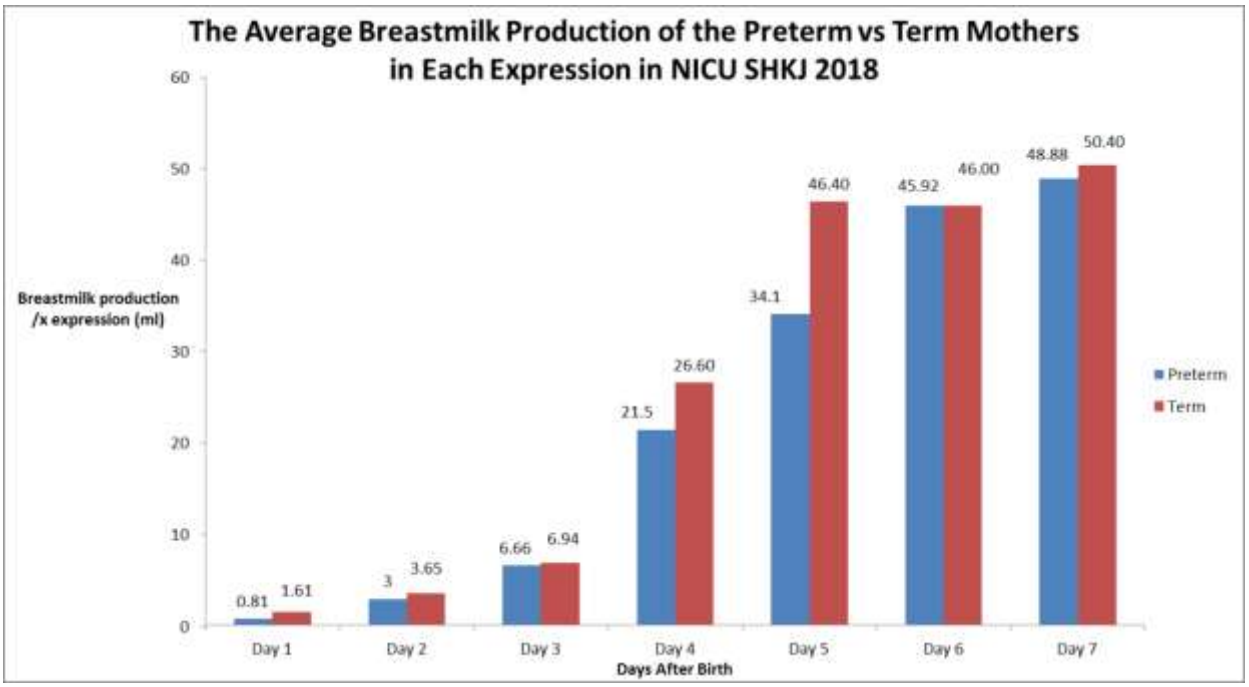


Figure 3. Breastmilk Production Chart

The breastmilk production is increasing everyday both in preterm and term babies. The highest increment can be seen in day 4 after birth and continues until day 7. Breastmilk production of preterm babies seem to be fewer than term babies in day 1 until day 5, but become almost same in day 6 until day 7 after birth. The highest average breastmilk production per expression in our NICU is 50.4 ml for term baby and 48.8 ml for preterm baby at day 7.

Discussion

Human milk is the preferred food for infants, including ill and preterm infants. As we all know, it is difficult to get MOM for preterm babies due to delayed of lactogenesis II and mother's stress. Because of that, we try to implement the 5 concepts of Family Centred Care (FCC) to support the successful of MOM production in our NICU. It include family's care taking, equal family participation, collaboration, maintaining family's respect and dignity & knowledge transformation.[41]

The implementation of FCC concepts is as follows:

1. Change in paradigm of care-giving in NICU
2. Parents are integral part of the care team and are partners with nurses and medical team
3. Nurses are teachers and consultants to parents
4. Parents assume most of the care of baby, except for IV, medication and tests
5. Parents gain confidence, knowledge and control.[41]

We build the FCC concept and special rooms in our NICU so mothers can stay 24 hours beside the babies. They can do Kangaroo Mother Care (KMC)and breastfed with Cpap. Mothers also encouraged to empty the breast every 3 hours using hands for 3 initial days and breastpump thereafter. NICU staff and Lactation team routinely educate and monitor the discipline of the mothers. We also give psychological support to reduce maternal stress. We documented breastmilk production per expression from day 1 until day 7 after birth. We adjust the lactation intervention according to patient's needs e.g. breast massage, lactation massage, lactagogue or supplementation with breastmilk donor.

Our hospital especially NICU staff and Lactation team always encourage mothers of ill and premature babies to begin milk expression within 4-6 hours following delivery. This mothers produced greater milk volumes at the initial milk expression session and at every 24-hour period during the first 7 days following delivery. Breast milk production between mothers of premature and mature babies in the first 7 days of life in our NICU is not significantly different.

Mothers who began milk expression after 6 hours following delivery had an earlier onset of lactogenesis stage II. Lactogenesis stage II define by a sudden feeling of breast fullness. In term mothers, timing of lactogenesis stage II begins by approximately 36 hours following delivery and is completed by approximately 4 days. However, 82% of mothers delivering premature infants had an impaired lactogenesis stage II and there was a finding reported a 1-day delay in the onset of lactogenesis stage II in mothers of premature infants.[20] In this study, mothers experienced a delay in timing of lactogenesis stage II, which begin at day 4 after birth.

Hill et al. found an association between timing of expression initiation and adequate milk production (defined as milk output of ≥ 3.500 mL/week) in weeks 2-6.[20] In this study, the highest average breastmilk production per expression in our NICU is 50.4 ml, around 2822.4 mL/week in week 1. This data support 63.2% successful rate of exclusive breastfeeding in our NICU during 2018.

Conclusions

Expressing for a preterm or unwell baby requires commitment by the mother and effective support from staff. Commence breast milk expression as soon as possible after birth and at least within the first six hours, followed by frequent, regular and effective breast milk expression to stimulate adequate breast milk production may provide MOM even for preterm babies in NICU.

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