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SHORT COMMUNICATION

Recommendations to promote breast milk feeding and enhance nutritional care for preterm infants in the Asia-Pacific region: highlights from a roundtable discussion of key opinion leaders

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ABSTRACT

Introduction: Preterm infants are vulnerable to nutritional deficiencies, thus optimal nutrition is crucial in promoting growth among these infants. However, socio-cultural complexities and limited resources in the Asia-Pacific demands a judicious approach in implementing nutritional care that is pragmatic to align with current evidence-based recommendations. **Methods:** A roundtable meeting was held in Jakarta in 2017 for key opinion leaders in neonatology from the Asia-Pacific to discuss issues when delivering nutritional care in this region and the unique circumstances encountered. **Results:** Priority areas discussed include: (i) breast milk feeding, (ii) donor milk bank/sharing, (iii) human milk fortification, and (iv) nutrient-enriched breast milk substitutes. Socio-cultural practices impeding breastfeeding, insufficient maternity leave, the religious issue of milk kinship, and limited availability of specialty nutritional care products were among the most challenging factors. **Conclusion:** The group proposed recommendations to enhance breastfeeding uptake, accessibility to a complete portfolio of specialty nutritional care products, and encouraging more active collaborations to engage policy makers in addressing these contemporary issues.

Keywords: Breastfeeding, donor human milk, human milk fortifier, milk kinship, preterm infant

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INTRODUCTION

Preterm birth, defined as any live birth before 37 completed weeks of pregnancy, is one of the primary contributors to increased neonatal morbidity and mortality. Globally, it is estimated that one in ten infants are born preterm and more than half are in Asia (Chawanpaiboon *et al.*, 2019). Being cared for outside the womb, preterm infants are vulnerable to nutritional deficiencies and imbalance, which impact on their growth. There is substantial evidence that growth deficits amongst preterm infants are associated with poor neurodevelopmental outcomes later in life (Meyers *et al.*, 2018). Curbing postnatal growth failure is, therefore, an important agenda for improving neonatal care in this region.

METHODS

Given the socio-cultural complexity in the Asia-Pacific population, it is necessary for key opinion leaders (KOLs) in this region to meet and review challenges faced when providing nutritional care to preterm infants and to put forward a proposal to overcome these obstacles. A meeting was organised in Jakarta in 2017 to render a platform for neonatologists to exchange views on these issues. Eight experts in the field of neonatology from Australia, India, Cambodia, Indonesia, and Malaysia evaluated present feeding practices in this region and discussed the strengths and weaknesses in conforming to the current recommendations in feeding preterm infants.

RESULTS AND DISCUSSION

The roundtable discussion (RTD) highlighted four key areas in implementing quality nutritional care among preterm infants, namely (i) breastfeeding, (ii) donor milk bank/ sharing, (iii) human milk fortification, and (iv) the use of nutrient-enriched breast milk substitutes (BMS).

(i) Breastfeeding

The KOLs agreed on the use of human milk or breastfeeding as the first feeding option for preterm infants. Breastfeeding confers both short- and long-term advantages to infants and mothers. Human milk contains biologically active substances that promote gut development and foster immunity to fight against infections.

Despite the benefits of breastfeeding, it is not always feasible to breastfeed preterm infants due to several factors. Since preterm labour is a stressful event, a high level of stress hormone disturbs the lactational pathways, reducing the amount of breast milk being produced. The lack of nipple stimulation due to the inability of preterm infants to suck at the breast compromises breast milk production and the letdown process. Moreover, cultural practices in the postpartum confinement period, where women who just gave birth recuperate at home, separates the preterm infants in hospital from their mothers. Besides, large family units exist in this region, causing mothers to have difficulty to breastfeed their infants at the hospital as they have other children to care for at home. Short maternity leave is also associated with a shorter duration of breastfeeding (Seah & Cheah, 2017).

Promoting breastfeeding optimises the nutritional support of preterm infants and reduces the dependency on financial resources to buy BMS. Regarding this, more lactation consultants (nursing professionals who are trained to assist new mothers in breastfeeding) are needed to intensify breastfeeding support for mothers. Experts in this meeting acknowledged that socio-cultural practices, such as postpartum confinement, may have a negative impact on breastfeeding

preterm infants, but it may be culturally insensitive and practically impossible to do away with these rituals. The mobilisation of community nurses during home visits for mothers who just gave birth to educate on the necessary skills and facilitate the transport of expressed milk to hospital so that their preterm infants in hospital can receive the benefits of mother's own milk (MOM) may partly help in addressing this issue. Interestingly, in Indonesia, the engagement of courier services by mothers who returned to work early or who are still in confinement could be one way to facilitate the transfer of MOM to the hospital. However, strict quality assurance monitoring should be enforced to ensure the safety and quality of MOM especially in the tropical heat and with the significant delays from congested road traffic. The provision of more rooming-in facilities and private spaces for kangaroo mother care (KMC, the practice of skin-to-skin contact nursing for the baby by a parent) prior to discharge from hospital is likely to promote breastfeeding uptake that persists for a longer duration. If not possible, mothers should be encouraged to visit and stay for as long as possible in the neonatal intensive care unit (NICU) to partake in the care of their preterm infants and indulge in as many KMC sessions as possible to increase bonding and breastfeeding. At home, when mothers are not with their infants, they should be reminded to express their breast milk at least six to eight times a day, as if the infants were breastfeeding regularly.

The matter of short maternity leave was raised by several KOLs in this meeting. It was suggested that more efforts were required to engage with law-makers in enacting legislation to extend paid maternity leave to 18 weeks as per recommendations by the International Labour Organisation (Addati, Cassirer & Ghilcrist, 2014), in order to promote exclusive breastfeeding for at least six months after birth. Leaders in the community, non-governmental organisations, and celebrity personalities were some of the proposed personnels that could help to move this change. In India, the government has mandated paid maternity leave for six months to enhance the rate of continued exclusive breastfeeding in the country.

(ii) Donor milk bank/sharing

When there is inadequate MOM, donor human milk (DHM) is the next best option as recommended by the World Health Organization (WHO) (WHO, 2006). There are two primary approaches in obtaining DHM, either from the human milk bank or one-to-one breast milk sharing. In this meeting, only the KOL from Australia maintained that a milk bank is being established in Australia, but not in the other countries represented. The human milk bank is a centralised institution that collects and pools breast milk from multiple pre-screened mothers. The collected milk is pasteurised to reduce pathogenic contamination before being used to feed infants. This concept of distributing pooled DHM from a centralised institution, however, may not be acceptable in certain Southeast Asian countries with a predominantly Muslim population due to the issue of milk kinship (Seah & Cheah, 2017). Milk kinship in the Islamic context is deemed established when a baby is breastfed at least five times by a donor mother, which results in the recipient baby and donor's children becoming siblings. Although they are not biologically-related, marriage is prohibited between them in this religious perspective. The lack of expertise, shortage of funds, and limited infrastructure further hinder the establishment of human milk banks in most parts of this region.

Another approach is through one-to-one milk sharing. This remains as the current mainstream approach in the region's predominantly Muslim nations. Even so, the social, medical and legal implications of this practice need to be addressed more thoroughly as most hospitals do not have a formalised protocol to supervise and coordinate the milk sharing process.

With the above considerations, the involvement of religious leaders in human milk banking initiatives to address the issue of milk kinship is crucial to establish a permissible or "halal" milk bank in the religious context. Various safeguarding measures have been proposed when establishing a human milk bank in Muslim countries (Seah & Cheah, 2017). In addition, international collaborations may further facilitate the alignment of human milk banks globally with countries in the Asia-Pacific region. Currently, one-to-one milk sharing is practised sporadically and regarded as a feasible alternative. Nevertheless, the entire sharing process is preferably institutionalised, taking into account the safety aspects and protection of individuals, with pre-screening of the donors and pasteurisation of the donor's milk. It is emphasised that the commercialisation of milk sharing and informal sharing via social media should be strongly discouraged (European Milk Bank Association, 2020).

(iii) Human milk fortification

Next, fortification of breast milk refers to the addition of a milk-based supplement to boost the nutrient content of human milk. It is especially important to preterm infants, who require more energy and protein for growth and micronutrients for bone mineralisation when compared with term normal infants (Table 1). Despite its importance, human milk fortifiers were not accessible in some countries like Cambodia.

Table 1. Comparison of nutrient contents in unfortified, fortified breast milk, preterm and post-discharge formula in 100mL against the recommended intake (per kg/day) for preterm infants

Nutrient content	*Breast milk (unfortified)*	*Breast milk added with human milk fortifier (fortified)*	*Preterm formula*	*Post-discharge formula*	*Recommended intake*[†]
Energy (kcal)	49-73	63-87	82	74	110-135
Protein (g)	1.1-2.7	2.1-3.7	2.2	1.9	3.5-4.5
Carbohydrate (g)	5.1-6.2	6.9-8	8.4	7.7	11.6-13.2
Lipid (g)	2.2-3.3	2.5-3.6	4.4	4.1	4.8-6.6
Calcium (mg)	25-29	142-146	101	78	120-140
Phosphorus (mg)	9.5-12.8	76.5-79.8	61	46	60-90

[†]Recommended intake by the European Society of Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) Committee on Nutrition (Agostoni, Carnelli & Buonocore, 2010)
Note: The energy, macronutrient and micronutrient contents of breast milk (unfortified) (Gidrewicz & Fenton, 2014) are relatively lower than the ESPGHAN recommendation. However, the addition of human milk fortifier to breast milk increases the nutritional value to meet the recommended requirement and is comparable to the nutrient-enriched formula. Values are adapted with reference to the use of a typical human milk fortifier, preterm formula or post-discharge formula (Cheah, 2017).

(iv) Nutrient-enriched breast milk substitutes

Preterm infants who do not receive breast milk because of ongoing maternal illnesses require the use of specialty BMS, which is vital to promote growth. The BMS, previously called infant formula, is predominantly a cow's milk-based, nutrient-enriched formula, compounded to meet most of the infants' nutritional and growth requirement. The preterm infant BMS is a special category of nutrient-enriched BMS that supplies higher energy content to these infants, while post-discharge formula (PDF) is formulated with some extra energy and micronutrients for feeding preterm infants after hospital discharge until satisfactory "catch-up" growth is attained, while the standard term BMS is for normal term infants (Table 1).

The BMS for preterm infants is available in powder or ready-to-feed (RTF) liquid form. The RTF liquid formulation is made sterile with no risk of bacterial contamination. Less manpower is required compared with milk prepared from powder form and it may prove to be more cost-effective in the long run (Marino, Meyer & Cooke, 2013). From the safety perspective, it is generally recommended that the use of RTF is the preferred option over powdered milk formula for preterm infants in the neonatal intensive care unit. Regrettably, majority of the KOLs (except Malaysia and Australia) revealed that many countries in this region still have no access to RTF preterm formula.

At the time of hospital discharge, more than 80% of preterm infants are in some state of suboptimal growth in two countries in Asia (Lee *et al.*, 2019). In this regard, the nutrient-enriched PDF could promote some "catch-up" to attain a more satisfactory growth trajectory in infants who are especially not being breastfed at home. The use of PDF is associated with better weight gain and improved linear growth, likely from increased bone mineralisation compared to the standard term formula, particularly among preterm infants of very low birth weight (<1500 grams at birth) (Teller *et al.*, 2016). Nevertheless, PDF was considered expensive and still inaccessible in many resource-limited countries.

With regards to the limited and inconsistent availability of HMF and specialty BMS, a persuasive call is necessarily made to the respective governments, industries and related agencies to work together to actively promote breastfeeding and relax some regulatory processes such as reducing the price of human milk fortifiers and specialty preterm BMS. Furthermore, the expansion of health insurance benefits to subsidise the cost of special medical purpose formulas for infants, as ongoing in Victoria, Australia could promote affordable unlimited access to quality nutritional care for preterm infants. The key highlights of this RTD are summarised in Table 2.

CONCLUSION

In conclusion, with a socio-culturally diverse population in Asia-Pacific, the KOLs in this RTD canvassed all countries in the Asia Pacific region to collaborate in conducting multi-centre research projects to improve the uptake of breast milk, such as donor milk sharing or banking, and to promote ways to enhance the portfolio of nutritional care in the feeding of preterm infants. It is hoped that this research output will empower healthcare providers in putting forward an agenda to convince policy- and law-makers to create changes to overcome the various impediments to optimal nutrition for preterm infants in the Asia-Pacific.

Table 2. Key highlights from a Roundtable Discussion on Challenges and Potential Solutions in Feeding Preterm Infants in the Asia-Pacific

	Identified challenges	*Proposed solutions*
Mother's own milk	• Lacking in many cases because of maternal illness or preterm birth.	• Increase lactation consultants and community nurses for home visit to support mothers of preterm infants. • Provide quality and regulated courier services for transporting breast milk from home to hospital. • Offer rooming-in and kangaroo mother care support facilities. • Promote legislated longer and fully paid maternity leave.
Donor human milk	• The religious issue of milk kinship. • Lack of milk banking resources. • Lack of formal protocol for milk sharing. • Screening of the donor. • Safety issues.	• Continuous engagement of religious leaders' participation in dealing with issues on the use of donor milk. • Intensify sharing of expertise between countries in establishing human milk banking. • Formalise breast milk sharing procedures. • Develop a system that streamlines processes to address milk kinship.
Human milk fortifier (HMF)	• Relatively expensive. • Limited availability globally.	• Reduce price or subsidise. • Increase availability and distribution. • Innovative measures needed so as to not interrupt direct breastfeeding when HMF is added to breast milk.
Breast milk substitute (BMS)	• Limited range of nutrient-enriched BMS. • Limited availability and distribution of ready-to-feed (RTF) formulation. • Relatively expensive per unit of RTF item.	• Reduce price or subsidise. • Increase availability and distribution. • Regulatory bodies to refine policies on the use of specialty formula for preterm infants. • Balanced perspective on the use of BMS for preterm infants to avoid conflicting with the BFHI†.

†BFHI: Baby-Friendly Hospital Initiative – An effort to ensure that all hospitals, maternity facilities and communities become centres of breastfeeding support launched by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) since 1991.

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Authors' contributions

CFC, conceptualised and drafted the framework of this manuscript, represented Malaysia, and contributed in the writing and reviewed the manuscript; TTL, prepared the draft of the manuscript, reviewed the literature and compiled the references; HU and DC, coordinated the

project and collated all the data obtained during the roundtable meeting; ML, led and moderated the discussion of the group and summarised the highlights of the meeting; DG, represented the Australasian region and contributed in the writing and reviewed the manuscript; RR, represented Indonesia and contributed in the writing and reviewed the manuscript; SS, represented India and contributed in the writing and reviewed the manuscript; VERM, chaired the discussion and contributed in reviewing the manuscript.

Conflict of interest

The KOLs received travel and lodging financial support to attend this roundtable discussion in Jakarta from the Danone-Nutricia establishment in Indonesia. Staffs employed by Danone-Nutricia participated in the meeting to provide support but were not involved in any way in presenting the viewpoints raised at this roundtable discussion as reported in this manuscript.

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