Symposium

Tuesday, 6 August 2019
09:30 – 11:00

Adequate supply of LCPUFAs during early life and its benefits for maternal and infant health

The first 1000 days of life, generally designed as the period from conception to age of two, are critical for growth and development. This window is characterized by rapid growth and development with nutritional requirements generally at their highest to support optimal growth and development of the fetus, infant and young child. Long-chain polyunsaturated fatty acids (LCPUFAs), and in particular docosahexaenoic acid (DHA) and arachidonic acid (ARA), are well known to play a key role in the development and function of the brain and vision during this window. New evidence also shows that genomic variation in the FADs genes can influence the metabolism of LCPUFA synthesis and thus the endogenous synthesis of DHA and ARA which might impact maternal and infant health outcomes.

At the Asian Congress of nutrition, we present on the latest evidence that further supports the importance of adequate availability of these essential LCPUFAs during pregnancy, lactation and discuss the consequences on maternal and early life health outcomes.

More specifically, the following key opinion leaders will share their latest scientific work.

Emeritus Professor Kraisid Tontisirin, Mahidol University Bangkok, will discuss the importance of adequate nutrition during the first 1000 days and provide a specific focus on the intake, status and recommendations regarding LCPUFAs in Asian countries.

Professor Maria Makrides, Adelaide Medical School, will discuss her recent Cochrane paper on importance of Omega 3 fatty acids (O3FA) in the risk reduction of early preterm and preterm births and will expand on her newest, unpublished findings of the ORIP trial (Omega-3 LCPUFA supplementation to reduce the incidence of preterm birth).

Doctor Conny Tanjung, Pantai Indah Kapuk Hospital Jakarta, will discuss her results of the prevalence of genetic variation in the FADs genes in an Indonesian cohort and its contribution to individual variability in response to PUFA consumption in the diet. She will further elaborate on the consequences for fetal and infant health in Indonesia.

The role of adequate nutrition in the first 1,000 days–Reflections on Asian region.

Kraisid Tontisirin, M.D., Ph.D., Professor Emeritus and Senior Advisor

Institute of Nutrition, Mahidol University, Thailand

The first 1,000 days of life is a critical period for promoting optimum nutrition and health outcomes from conception to two years of age when rapid growth and development of organs and the whole body occur. Inadequate nutrition and cares will result in malnutrition, poor growth, development, low cognitive and immune functions, and high risk for non-communicable diseases in later period of life. Asia is the largest continent in the world, both in terms of areas and population, and most countries have faced with a various degree of both macro and micronutrients deficiencies among pregnant and lactation mothers as well as infants and young children. As a consequence, maternal anemia, low birth weight, stunting, underweight and iodine deficiency are still highly prevalent. Main causes of malnutrition include poor maternal nutrition and health, declining of breastfeeding practices, inadequate and inappropriate complementary feedings, poor sanitation in feeding and cares, frequent infections and illness. Problematic nutrients identified recently as often limited in diets of young children worldwide by one international expert group are vitamins A, D, B12, C and folate, and calcium, iodine iron, zinc and DHA.

National nutrition and health service programs implemented at community or local level through antenatal cares with food, and multiple vitamins and minerals supplements are required for pregnant and lactating mothers as well as growth monitoring and promotion for infants and young children to cover breastfeeding, complementary feeding, cares, monitoring of growth and development, and take remedial actions as needed. These interventions hopefully will lead for achieving global nutrition targets and wellbeing of current and future generation.

Professor Emeritus Kraisid Tontisirin, is a Senior Advisor, Institute of Nutrition, Mahidol University (INMU), was a member of the National Food Committee and chairman of the Planning Committee for the Strategic Framework for Food Management in Thailand, and a member of the National Research and Innovation Council. He had contributed significantly in policy planning, research and development to the successful nutrition program of Thailand during the eighty under the “National Poverty Alleviation Plan” and has continued involving at national and international levels to share experience for achieving food and nutrition security.

Prof. Kraisid Tontisirin served as the Director of Food and Nutrition Division, the Food and Agriculture Organization of the United Nations (FAO) in Rome, Italy from 2000-2006, the Director of INMU from 1991 to 1999 and the Vice President of Mahidol University on Planning and Research from 1987-1991. He was a Professor of Pediatrics at the Faculty of Medicine Ramathibodi Hospital, Mahidol University. His education and training included M.D. with honor from Siriraj Medical Faculty, Mahidol University, PhD in Nutrition from M.I.T., pediatric training from Vanderbilt and Harvard Universities.

He received numerous recognitions and awards including the Distinguished Alumni from Faculty of Science and from Siriraj Medical Faculty, Mahidol University, the Most Distinguished Thai of the Year in 1999 from the Royal Thai Government, Dusadee Mala Kem Silapa Vithaya (the most distinguished medal in recognition of the contributions in art and science for Thailand) from His Majesty the King in 2005, and Breast Feeding Promotion Award from UNICEF and Ministry of Health. He also received the American Dietetic Association’s Frances E Fischer Lecture Award in August 2008. In September 2013 at the 20th International Congress of Nutrition, he received the “The 2013 IUNS Lifetime Achievement Award” from the International Union of Nutritional Science. This award has been given every 4 years to a person who has made exceptionally contributions in nutrition at national, regional and global levels. Recently in 2018 he received the most Distinguished Physician Award from the Medical Council of Thailand.

Nutritional strategies involving omega-3 fatty acids to reduce the risk of prematurity

Maria Makrides

South Australian Health and Medical Research Institute
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There is strong interest in the effect of omega-3 long chain polyunsaturated fatty acids, from fish and marine sources, on pregnancy outcomes. In November 2018, we published a Cochrane review assessing the effects of omega-3 supplementation on pregnancy outcomes. The review included 70 randomised trials involved 19,927 women at low, mixed or high risk of poor pregnancy outcomes. Almost all trials included women with singleton pregnancies and most trials were conducted in upper-middle or high-income countries. Omega 3 LCPUFA supplementation was associated with reduced preterm birth (<37 weeks, from 13.4% to 11.9%) and early preterm birth (<34 weeks, from 4.6% to 2.7%). Prolonged gestation >42 weeks was probably increased (from 1.6% to 2.6%) in women who received omega-3 LCPUFA compared with no omega-3. There was a reduced risk of low birthweight babies; but a possible small increase in large-for-gestational age babies with omega-3 LCPUFA. There were possibly fewer perinatal deaths and possibly fewer neonatal care admissions with omega-3 LCPUFA.

The review concluded that omega-3 LCPUFA supplementation during pregnancy can be an effective strategy for reducing the incidence of preterm birth for women with singleton pregnancies. With an additional 23 on-going studies, the review also indicated that new studies to assess the efficacy of omega-3 LCPUFA were not justified but that further studies should establish if, and how, outcomes vary by different types of omega-3 LCPUFA, timing and doses; and/or by characteristics of women.

Important clues are emerging from new studies to indicate that women with the lowest omega-3 LCPUFA status are most at risk of preterm birth, raising the possibility that it will be able to identify groups of women with a functional omega-3 LCPUFA insufficiency and who are most likely to respond to supplementation to reduce their risk of having a preterm baby. This has the potential to optimise the benefits of omega-3 LCPUFA supplementation by reducing preterm and early preterm birth while avoiding possible adverse outcomes of supplementation.

Maria Makrides is the Theme Leader for SAHMRI Women and Kids, which is based at the Women's and Children's Hospital and Deputy Director at the South Australian Health and Medical Research Institute (SAHMRI), Adelaide, Australia.

As a research dietitian, Maria is committed to improving the nutrition and health of mothers and their babies through the conduct and translation of high quality research. She has over 250 peer reviewed publications including in the prestigious journals the Lancet, the New England Journal of Medicine, the Journal of the American Medical Association and the British Medical Journal.

Maria's work has been responsible for changes in international policy regarding the safe composition of infant foods, national and international guidance on diet and supplementation during pregnancy, and infant feeding guidelines to minimise the risk of childhood allergies. She is an elected Fellow of the Australian Academy of Science (2019) and the Australian Academy of Health and Medical Science (2014). In 2018 she was awarded the Alexander Leaf Distinguished Scientist Award for Lifetime Achievement by the International Society for the Study of Fatty Acids and Lipids (ISSFAL).

Recent Findings On FADS, SNPS And Implications On Infant Nutrition And Health With The Focus On Indonesian Infant

Conny Tanjung

Pantai Indah Kapuk Hospital
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Long chain polyunsaturated fatty acid (LC-PUFAs) with its metabolites of both the n-6 and n-3 families is important in every stage of human life. Furthermore, the concentration of LC-PUFAs in phospholipids has been associated with numerous complex diseases like cardiovascular disease, atopic disease and metabolic syndrome. The level and composition of LC-PUFAs in the human body is mainly dependent on their dietary intake or on the intake of fatty acid precursors, which are endogenously elongated and desaturated to physiologically active LC-PUFAs.

Randomized controlled trials supplementing infants with L-PUFAs in different stages of the perinatal period have used different types and doses of LC-PUFAs as well as different tests to assess cognitive outcomes. Findings from these studies have not shown consistent effects in meta-analyses. One more thing to take into consideration is the marked impact of single nucleotide polymorphisms (SNPs) in the fatty acid desaturase (FADS) gene clusters on the activity of FADS enzymes, as well as precursor PUFA and LC-PUFA levels in blood and tissue. Some recent findings had shown good association among FADS SNPs, LCPUFA composition and health outcome in the field of developmental such as IQ and autism, allergic diseases, heart disease and diabetes mellitus type 2.

Our study regarding variants of the FADS1, FADS2, and FADS3 genes in Indonesian newborns and their relation to LC-PUFA composition in umbilical artery plasma has shown a marked impact of genetic variation in the FADS1-3 gene clusters on plasma LC-PUFA composition in umbilical artery plasma lipid and their functional effect are on contrary to European population. In our study, the minor alleles in Indonesian infants were associated with lower levels of substrates (LA and ALA) and higher levels of products (DGLA and ARA) and ratios of DGLA/LA, ARA/DGLA, and ARA/LA, indicating higher desaturase activity. Understanding this genetic variation among populations should increase the awareness about the importance of personalised nutrition for the development of more effective interventions for improving public health.

EDUCATION

1986-1993	:	Faculty of Medicine, Hasanuddin University, Ujung Pandang, Indonesia
2001-2005	:	Pediatric Department, Indonesian University, Jakarta, Indonesia
2009-2014	:	Nutrition and Metabolic Subspeciality, Indonesian University, Jakarta, Indonesia
2014	:	Fellowship Inborn Errors of Metabolism, Sheffield, United Kingdom,
2016	:	Finished PhD degree from Indonesian University, Jakarta, Indonesia

ORGANISATION POSITION

2017-2020	:	Secretary of Nutrition and Metabolic Diseases Working Group of Indonesian Pediatric Association
2005-2008	:	Secretary of Nutrition and Metabolic Diseases Working Group, Jakarta Branch, Indonesian Pediatric Association
2008-2011	:	Chairperson of Nutrition and Metabolic Diseases Working Group, Jakarta Branch, Indonesian Pediatric Association

PUBLISHED ARTICLES

1. MF Conny Tanjung, Rini Sekartini. Masalah gangguan tidur pada anak. Sari Pediatri. 2004;6:138-42
2. Tanjung C, Lukito J, Meylani P. Nutritional status and physical activity of childhood leukemia survivors. Pediatrica Indonesiana [Internet]. 30Apr.2014;54(2):67-2.
3. Penambahan lutein dalam susu formula: suatu review sistematik. Cermin Dunia Kedokteran
4. Susu Formula dan Peraturan Perundang-Undangan. Buku Ajar Nutrisi dan Penyakit Metabolik hal 98-116. Jilid 1. Penyunting Damayanti Rusli Sjarif, Endang Dewi Lestari, Maria Mexitalia, Sri Soedarjati Nasa. Ikatan Dokter Anak Indonesia. 2011.
5. Tanjung C, Watkinson J, Olpin S, et al. Lysinuric Protein Intolerance: A Treatable Cause of Developmental Delay with Multiple Complications. Pediatr Neonat biol 2016, 1(1): 000103.
6. Tanjung C, Rzehak P, Mansyur M, et al. Study protocol to investigate the environmental and genetic aetiology of atopic dermatitis: the Indonesian Prospective Study of Atopic Dermatitis in Infants (ISADI). BMJ Open 2017;7:e012475. doi: 10.1136/bmjopen-2016-012475
7. Tanjung C, Rzehak P, Sudoyo H, et al. The association of fatty acid desaturase gene polymorphisms on long-chain polyunsaturated fatty acid composition in Indonesian infants. Am J Clin Nutr 2018;108:1135–1144.