Iron Status is Associated with Body Composition in Cambodian Infants and Young Children

Frank Tammo Wieringa1*, Jutta Skau2, Chhoun Chamnan3, Henrik Friis2, Marjoleine Amma Dijkhuizen2, Jacques Berger1, Kim Michaelsen2 and Nanna Roos2

1Institute de Recherche pour le Développement, Montpellier, France.
2Copenhagen University, Copenhagen, Denmark.
3Department of Fisheries Post-Harvest Technologies and Quality Control, Fisheries Administration, Phnom Penh, Cambodia.

ABSTRACT

Objectives: Malnutrition in early childhood predisposes to a higher risk for non-communicable diseases such as obesity and cardio-vascular diseases later in life through not fully understood metabolic alterations. Little is known about body composition in early childhood in relation to micronutrient status.

Methods: Infants were recruited through the WinFood project which studied the effectiveness of fortified complementary foods (FCF) in improving health and growth. Anthropometry (weight, height, MUAC, skinfolds), body composition (deuterium dilution) and micronutrient status (iron, zinc, vitamin A) were measured at 6 mo and 15 mo of age.

Results: From 269 Cambodian infants data on body composition and micronutrient status were available for both time-points. Lean body mass increased with 1.96 ±0.59 kg, whereas percentage body fat decreased from 21.7% to 14.9% over the study period (P<0.001). At 6 and 15 mo of age, body fat was strongly correlated to ponderal growth (WHZ, P<0.01) but not to length growth (HAZ) or gender. Vitamin A and zinc status were not related to fat mass. Iron status at 6 and 15 months of age significantly correlated with body composition, with infants with no iron stores at endpoint.
having a higher fat mass (14.0% vs 15.5%, P=0.02). Infants without iron deficiency during the study had significant lower fat mass (13.3%) than infants who were iron deficient at both time-points (16.4%, P<0.01).

**Conclusions:** Iron status, but not vitamin A or zinc status, was related to body composition in Cambodian infants. FCF aimed at improving iron status in early childhood may have long-term health benefits.

© 2015 Wieringa et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.