

Effect of Moringa Oliefera Supplementation During Pregnancy on Nutritional Status in Children 2–5 Years Old in Indonesia: A-Follow-Up Study

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Objectives: To examine the effects of prenatal *Moringa oleifera* extract (EG) or powder (PG), compared to iron-folic acid (IFA) supplementation during pregnancy on nutritional status of children aged 2–5 years in Indonesia.

Methods: Participants were children (2–5 y) born to pregnant women who participated in a randomized controlled trial. In the parent trial, pregnant women were randomized to receive Moringa oleifera extract (EG) or powder (PG), or iron-folic acid (IFA), twice weekly during pregnancy beginning in the third trimester. Capillary blood samples were collected in children by a trained phlebotomist. Whole blood samples were analyzed for hemoglobin (Hb) via portable hemoglobinometer (HemoCue Hb 201 + analyser, Helsingborg, Sweden). Hepcidin concentrations were measured by ELISA (ELISA Technique, BT LAB, Shanghai, China) and lactic acid was measured

via RT-PCR. Anemia was defined as hemoglobin concentrations of < 11.0 g/dL. Height-for-age (HAZ) Z-scores were calculated using the World Health Organization (WHO) Child Growth Standards and used to define stunting (HAZ < -2 SD). Multivariate analyses were conducted to determine the effect of the interventions on outcomes.

Results: The prevalence of stunting at baseline in EG was 42 (28.8) lower than PG and IFA [59 (40.4) and 45 (30.8)]. The prevalence of stunting (HAZ < -2) was lower at each time point (i.e., 2–3 y; 3–4 y; 4–5 y) during follow-up in the EG group, compared to PG or IFA groups ($P < 0.05$), and the number of stunted cases significantly decreased during follow-up in the EG group, compared to the PG or IFA groups ($P < 0.05$). The quantity of lactobacillus lactic acid bacteria was significantly higher in the EG group compared to the other groups at 2–3 y (6.88 log CFU/gram vs. 6.57; 5.94 log CFU/gram; $P < 0.05$). Hepcidin concentrations were significantly higher in EG groups than PG or IFA (1.85 ng/mL vs 1.38; 0.9 ng/mL, although there were no differences in hemoglobin concentrations between intervention groups).

Conclusions: Findings suggest that *Moringa oleifera* extract supplementation during pregnancy was associated with lower prevalence of stunting in children in this population.

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