

## Effect of Omega-3 Supplementation on Stunted Egyptian Children at Risk of Environmental Enteric Dysfunction: An Interventional Study

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**Abstract :** Background: Environmental enteric dysfunction (EED) is asymptomatic villous atrophy of the small bowel that is prevalent in the developing world and is associated with altered intestinal function and integrity. Evidence has suggested that supplementary omega-3 might ameliorate this damage by reducing gastrointestinal inflammation and may also benefit cognitive development. Objective: We tested whether omega-3 supplementation improves intestinal integrity, growth, and cognitive function in stunted children predicted to have EED. Methodology: 100 Egyptian stunted children aged 1-5 years and 100 age and gender-matched normal children as controls. At the primary phase of the study, we assessed anthropometric measures and fecal markers such as myeloperoxidase (MPO), neopterin (NEO), and alpha-1-anti-trypsin (AAT) (as predictors of EED). Cognitive development was assessed (Bayley or Wechsler scores). Oral n-3 (omega-3) LC-PUFA at a dosage of 500 mg/d was supplemented to all cases and followed up for 6 months after which the 2ry phase of the study included the previous clinical, laboratory and cognitive assessment. Results: Fecal inflammatory markers were significantly higher in cases compared to controls. (MPO), (NEO) and (AAT) showed a significant decline in cases at the end of the 2ry phase ( $P < 0.001$  for all). Omega-3 supplementation resulted also in a significant increase in mid-upper arm circumference (MUAC) ( $P < 0.01$ ), weight for age z-score, and skinfold thicknesses ( $P < 0.05$  for both). Cases showed significant improvement of cognitive function at phase 2 of the study. Conclusions: Omega-3 supplementation successfully improved intestinal inflammatory state related to EED. Also, some improvement of anthropometric and cognitive parameters showed obvious improvement with omega-3 supplementation.

**Keywords :** cognitive functions, EED, omega-3, stunting

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