

The effects of zinc supplementation on the TNF-a profile and diarrhea in severely malnourished children of low income family

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Abstrak

Defisiensi seng (Zn) mempunyai peran yang besar pada proses tumbuh-kembang. Hal ini terutama akan berdampak pada anak-anak kekurangan gizi. Zn penting dalam kekebalan tubuh baik yang bersifat lokal maupun sistemik. Tujuan penelitian ini adalah untuk menilai dampak suplementasi Zn pada sitokin TNF-a dan diare pada balita dengan malnutrisi berat dari keluarga berpendapatan rendah. Desain penelitian adalah jenis controlled randomized double blind pre-test post-test pada kelompok anak berusia 12-59 bulan. Anak-anak diberi makanan biasa dan dibagi menjadi 2, kelompok kontrol (n=60) dan kelompok intervensi yang diberikan makanan mengandung 15mg/ml Zn. Kadar Zn diukur menggunakan atomic absorption spectrophotometer (AAS), sedangkan TNF-a menggunakan ELISA. Data masukan makanan dikumpulkan melalui cara wawancara makanan dalam 24-jam. Hasil penelitian menunjukkan adanya peningkatan kadar Zn serum yang bermakna dan penurunan kadar TNF-a serta penurunan lama dan frekuensi diare setelah intervensi. Kadar Zn meningkat 87,0% pada kelompok intervensi, sedangkan pada kelompok kontrol peningkatan hanya sebesar 19,6%. Selain itu, terdapat penurunan bermakna baik pada kadar TNF-a serum maupun feses setelah intervensi ($p<0.05$). Beratnya gejala maupun lamanya diare berkurang secara bermakna pada kelompok intervensi ($p<0.001$). Dari hasil penelitian ini dapat disimpulkan bahwa pemberian suplemen Zn dapat mengurangi lama dan beratnya diare melalui peningkatan kekebalan tubuh, terutama imunitas lokal yang menggunakan TNF- a sebagai biomarker. (Med J Indones 2003; 12: 247-51)

Zinc deficiency has a great impact on growth and development, especially in malnourished children. Zinc is important in both local and systemic immunity. The aim of this study was to assess the impact of zinc supplementation on the cytokine, tumor necrosis factor a (TNF-a), and diarrhea in severely undernourished under-five children of low-income families. A randomized double blind pre-test post-test controlled design was selected. A group of 12-59 month-old children were given local food, and treated as control group (n=60), and another group (n=60) were given local food with 15 mg/5 ml zinc as intervention group. Zinc concentration was measured by atomic absorption spectrophotometer (AAS), and TNF-a concentration was determined by ELISA. Data on nutrient intakes were collected using 24-hour food recall method. The result of the study showed that after zinc intervention, zinc serum increased significantly, and TNF-a concentration decreased along with reduction of the duration and frequency of diarrhea. Zinc concentration increased 87.0% in the intervention group, while in the control group the increase was only 19.6%. There was a significant reduction of both serum and fecal TNF-a concentration after intervention ($p<0.05$). Severity and duration of diarrhea were reduced significantly in the intervention group compared to the control group ($p<0.001$). It was concluded that zinc intervention reduced the duration and severity of diarrhea through improvement of immunity, especially local immunity with TNF-a as biomarker. (Med J Indones 2003; 12: 247-51)