NURSING UPDATE
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Paediatrician scoops AWARD for groundbreaking publication

Paediatrician and senior lecturer at the University of Limpopo, Dr Siyazi Mda, was presented with the Nestlé Nutrition Institute of Africa (NNIA) Award for his peer-reviewed scientific publication in the field of nutrition. This ground-breaking scientific publication is featured in the *Journal of Nutrition* (2010:140:969 – 974) under the title: Short-term Micronutrient Supplementation Reduces the Duration of Pneumonia and Diarrhoeal Episodes in HIV- Infected Children.

The study shows a significant reduction in disease episodes and hospital stays of HIV-infected children aged 4 to 24 months who were under the multi-micronutrient supplementation programme as part of their treatment regime during hospitalisation due to pneumonia and diarrhoea.

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In his acceptance speech, Dr Mda told nutrition experts present that the commonest paediatric admission diagnosis in South African hospitals is pneumonia and diarrhoea. "These diseases are more severe in HIV-positive children – who make up 60% of paediatric admissions in South Africa. "[The] children are often micronutrient deficient and we know that micronutrient deficiencies result in increased infection rates, even for pneumonia and diarrhoea," said Dr Mda.

Dr Mda's research intends to break this cycle, which is compromising children's potential for recovery. The results also showed that hospitalisation was reduced by 1.6 days and 1.9 days for children admitted for diarrhoea and pneumonia respectively.

The award was presented by NNIA Chairman, Professor Gabriel Anabwani, who said the institute is committed to shared knowledge in the area of nutrition, and values the contribution that scientific publications make in advancing common understanding of nutrition in Africa.

Professor Anabwani is the former chair of Paediatrics at Botswana's largest hospital, the Princess Marina Hospital, and is the current head of Baylor College of Medicine in Gaborone. He has extensive leadership experience in paediatric HIV/Aids care, treatment and clinical research in Africa.

Dr Mda's Presentation: Effect of short-term multi-micronutrient supplementation on duration of hospitalisation in HIV-infected children

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Introduction (1)

- The number of HIV-infected people in South Africa is ± 6.1 million, with ± 500 000 of them under the age of 15 years.
- Most of these children present with illness within 24 months of life and over 50% die before 3 years of age.
- The commonest paediatric admission diagnosis in South African hospitals is pneumonia followed by diarrhoea.
- About 60% of paediatric admissions concern HIV infected children.
- Pneumonia and diarrhoea are more severe with HIV.

Introduction (2)

Micronutrient deficiencies result in increased infection rates, including for pneumonia and diarrhoea.

Micronutrient supplementation may decrease infection rates. Micronutrient deficiencies are seldom limited to a single micronutrient, thus it may be advisable to use a multi-micronutrient supplement.

Objective

To assess whether a multi-micronutrient supplement would reduce the duration of hospitalisation for pneumonia and for acute diarrhoea in HIV-infected young South African children

Subjects and methods (1)

- HIV-infected children aged 4 – 24 months admitted with pneumonia or diarrhoea
- Entered into a randomised double-blind trial within 24 hours of enrolment (Nov '05 – May '07)
- Treatment: either a multi-micronutrient supplement or placebo daily until hospital discharge
- Supplement contained vitamins A, B1, B2, B3, B6, B12, C, D, E and folic acid and zinc, iron, copper and selenium at RDA levels

Subjects and methods (2)

- Exclusion criteria
- Pneumonia or diarrhoea episode longer than 72 hours prior to admission
- Respiratory failure on supplemental O_2
- Intake of micronutrients in two months prior to study
- Use of antiretrovirals [prescription was not yet common practice at the time of study]
- Chronic illnesses unrelated to HIV
- All children received trimethoprim-sulfamethoxazole and standard hospital treatment

"[The] children are often micronutrient deficient and we know that micronutrient deficiencies result in increased infection rates, even for pneumonia and diarrhoea," said Dr Mda.

Subjects and methods (3)

- IRB approval was obtained
- Weight and lengths measured within 24 hours of enrolment
- Blood sampling for CD4 and CD8 lymphocytes within 24 hours of admission
- Fasting blood samples taken for serum zinc, retinol, iron, ferritin, and Hb and CRP (1 to 2 days before discharge)
- Discharge after diarrhoea or pneumonia resolved: duration of hospitalisation recorded

Results (1)

- 389 children screened, of whom 118 were enrolled: 50 admitted with diarrhoea and 68 with pneumonia
- 12 children died during hospitalisation, 7 from placebo group (5 with pneumonia), and 5 from supplement group (3 with pneumonia)
- So, data on 106 children available for further analysis

Results (2)

	Placebo	Supplement
N	52	54
Age (months)	25/27	31/23
Male/Female	10.6/4.8	13.2/6.1#
WAZ	-2.77/1.26	-2.68/1.32
HAZ	-2.32/1.59	-2.30/1.61
WHZ	-1.53/1.30	-1.61/1.35

No significant difference in WAZ, HAZ and WHZ between treatment groups or between children admitted with diarrhoea or pneumonia

Results (3)

- Large proportion of the children were wasted and/or stunted [poor growth and stunting are known to be common in HIV-infected children]
- No significant difference in CD4 lymphocyte percentage between placebo (20.6 ± 13.3) and supplement groups (20.0 ± 11.7)
- No significant differences between placebo and supplement group in serum
  zinc (7.7 ± 2.7 vs. 8.2 ± 3.0)
  retinol (0.69 ± 0.36 vs. 0.76 ± 0.39)
  iron (7.6 ± 6.0 vs. 7.5 ± 4.7)
  log ferritin levels (1.86 ± 0.62 vs. 1.81 ± 0.48)

Note:

- Unfortunately, micronutrient levels were not measured at admission, so effect of supplement on serum levels within children could not be assessed
- Micronutrient status poor when compared to local lab reference values [poor micronutrient status is common with HIV infection]

	• Placebo	• Supplement
• n	• 52	• 54
• Hospitalisation duration (days)	• 9.0 ± 4.9	• 7.3 ± 3.9#

- Duration of hospitalisation 1.7 days (19%) shorter among children on supplement (#: $p<0.05$)
- Among children with diarrhoea, hospitalisation was 1.6 days (19%) shorter in supplement group (7.0 ± 4.5 vs. 8.6 ± 5.0)
- Among those with pneumonia, hospitalisation was 1.9 days (20%) shorter in supplement group (7.5 ± 3.5 vs. 9.4 ± 4.9)
- Short-term multi-micronutrient supplementation seems to significantly reduce the duration of diarrhoea and of pneumonia in HIV-infected children
- While the benefits of a single micronutrient are equivocal, a multi-micronutrient supplement as used in this study,, might be more beneficial in HIV-infected children
- Since at present it has become general practice in SA hospitals to treat admitted HIV-infected children with antiretrovirals, the question might be raised whether the observed beneficial effects of multi-micronutrient supplementation on duration of hospitalisation might be confirmed in HIV-infected children simultaneously treated with antiretrovirals (Journal of Nutrition 2010: 140: 969 – 974).

About the Nestlé Nutrition Institute of Africa (NNIA)

The NNIA (www.nnia.org) is a virtual institute aimed at promoting the understanding of the science of nutrition in Africa. It facilitates various activities through public-private partnerships including: scientific meetings; capacity building in clinical skills and research; continuous professional development; support for higher education; and recognition of health professionals for their work in the field of nutrition.