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Short children with a low MUAC do not gain excessive fat with food supplementation: an observational study from Burkina Faso

Introduction: Children with moderate acute malnutrition (MAM) in many settings receive food supplementation through outpatient programs. It is common practice to avoid measurement of mid-upper arm circumference (MUAC) of children, whose length is below a certain threshold (67 or 65 cm). Thus, even if short children have low MUAC they are excluded from malnutrition programs. This seems based on expert opinion that supplementation of shorter children with weight-for-height z-score (WHZ) ≥-2 may increase risk of excessive fat accumulation during treatment and later risk of non-communicable diseases. We have previously shown that ponderal growth rates are similar in short and longer children with low MUAC. To what extent there is difference in fat accumulation has not been assessed.

Objective: To assess if short children gain more fat than longer children when treated for MAM diagnosed by low MUAC.
Method: This was an observational study nested in a randomized nutrition trial. Children aged 6-23 months were included in this sub-study if their MUAC was between 115-125 mm, but WHZ ≥-2. Based on length at admission the children were categorized as SHORT if <67 cm and LONG if ≥67 cm. Linear mixed-effects models with site-specific random effects were used to compare changes in body composition, based on deuterium dilution, and skinfold thickness while adjusting for month of admission, baseline measure, intervention, sex and age.

Results: Following 12 weeks of supplementation, there was no difference in change in fat mass index (-0.038 kg/m2, 95%CI -0.257; 0.181, p=0.74) or fat-free mass index (0.061 kg/m2, 95%CI -0.150; 0.271; p=0.57) in SHORT vs LONG. In absolute terms, the SHORT children gained both less fat-free mass (-230 g, 95%CI: -355, -106, P<0.001) and less fat mass (-97 g, 95%CI -205, 10, p=0.076). There were no difference in changes in absolute subscapular and triceps skinfold thickness and z-scores (all p>0.5).

Conclusions: SHORT children with low MUAC do not gain excessive fat during supplementation. These data support a recommendation for policy change to include all children ≥6 months with low MUAC in supplementary feeding programs, regardless of length. The use of length as a criterion for measuring MUAC to determine treatment eligibility should be discontinued in policy and practice wherever such restrictions exist

Country

Denmark, Senegal

Institution

Department of Nutrition, Exercise and Sports, University of Copenhagen/ MSF-DK/ALIMA

Author: Dr FABIANSEN, Christian (Department of Nutrition, Exercise and Sports, University of Copenhagen, Rolighedsvej 30, DK-1958 Frederiksberg C, Denmark. Médecins Sans Frontières - Denmark, Dronningensgade 68, 3, 1420 Copenhagen, ALIMA, Route de l'Aéroport, Rue NG 96 BP: 15530. Dakar, Sénégal)

Co-authors: Prof. BRIEND, André (Department of Nutrition, Exercise and Sports, University of Copenhagen, Rolighedsvej 30, DK-1958 Frederiksberg C, Denmark. Center for Child Health Research, University of Tampere School of Medicine and Tampere University Hospital, Lääkärinkatu 1, 33014 University of Tampere, Finland); Prof. KURPAD, Anura (Division of Nutrition, St John´s Research Institute, Opp. BDA Complex, Koramangala, Bangalore –560 034); Dr CICHON, Bernardette (Department of Nutrition, Exercise and Sports, University of Copenhagen, Rolighedsvej 30, DK-1958 Frederiksberg C, Denmark. Médecins Sans Frontières - Denmark, Dronningensgade 68, 3, 1420 Copenhagen, Denmark); Mr YAMÉOGO, Charles W (Département Biomédical et Santé Publique, Institut

de Recherche en Sciences de la Santé, 03 BP 7047 Ouagadougou 03, Burkina Faso); Dr RITZ, Christian (Department of Nutrition, Exercise and Sports, University of Copenhagen, Rolighedsvej 30, DK-1958 Frederiksberg C, Denmark); Prof. FRIIS, Henrik (Department of Nutrition, Exercise and Sports, University of Copenhagen, Rolighedsvej 30, DK-1958 Frederiksberg C, Denmark); Dr IUEL-BROCKDORFF (Department of Nutrition, Exercise and Sports, University of Copenhagen, Rolighedsvej 30, DK-1958 Frederiksberg C, Denmark. Médecins Sans Frontières - Denmark, Dronningensgade 68, 3, 1420 Copenhagen,); Prof. WELLS, Jonathan (Childhood Nutrition Research Centre, UCL Great Ormond Street Institute of Child Health, 30 Guilford Street, London WC1N 1EH, UK); Mr PHELAN, Kevin (ALIMA, Route de l'Aéroport, Rue NG 96 BP: 15530. Dakar, Sénégal); Prof. MICHAELSEN, Kim F (Department of Nutrition, Exercise and Sports, University of Copenhagen, Rolighedsvej 30, DK-1958 Frederiksberg C, Denmark); Dr SHEPHERD, Susan (ALIMA, Route de l'Aéroport, Rue NG 96 BP: 15530. Dakar, Sénégal); Prof. FILTEAU, Suzanne (London School of Hygiene and Tropical Medicine, Faculty of Epidemiology and Population Health; Keppel Street, London, WC1E 7HT); Dr CHRISTENSEN, Vibeke (Médecins Sans Frontières - Denmark, Dronningensgade 68, 3, 1420 Copenhagen, Denmark. Department of Paediatrics, Righospitalet, Blegdamsvej 9, 2100, Copenhagen, Denmark)

Presenter: Dr FABIANSEN, Christian (Department of Nutrition, Exercise and Sports, University of Copenhagen, Rolighedsvej 30, DK-1958 Frederiksberg C, Denmark. Médecins Sans Frontières - Denmark, Dronningensgade 68, 3, 1420 Copenhagen, ALIMA, Route de l'Aéroport, Rue NG 96 BP: 15530. Dakar, Sénégal)

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