

Factors associated with growth in the first 1,000 days: Translating evidence into programs for stunting, wasting, and the double burden of malnutrition

Concurrent Session | Oct. 8, 2015 | 11:00am - 12:30pm | Balcony Room B

Moderator: Jennifer Burns, International Medical Corps

Speakers: William Checkley, Johns Hopkins Bloomberg School of Public Health; Justine Kavle, USAID's Maternal and Child Survival Program / PATH; and Amelia Reese-Masterson, International Medical Corps

Overview

Jenn Burns, IMC, served as the moderator of this concurrent session, and introduced the three speakers. This session meeting room was filled to capacity with interested listeners! The speakers followed one another, with a short period for discussion at the end of the session.

Dr. William Checkley, JHU School of Medicine

Dr. Checkley addressed the topic of malnutrition, both wasting and stunting. His funding comes primarily from the Gates Foundation. Malnutrition is the leading cause of childhood mortality and morbidity in developing countries, with up to 2 million deaths per year. Wasting is critically related to rates of mortality, while weight faltering is the more prevalent condition. Once a child is stunted it is hard to recover; stunted growth persists and has been associated with developmental delays.

What is the relationship between weight and height in the measurement of malnutrition? He looked at 8 cohort studies that included about 27,000 anthropometric measures of about 1,600 children. Stunting seemed to level off around 2-3 years of age, while weight velocity appeared to be more sensitive, and varied earlier in life. Statistical correlations between the two were not strong. The researchers looked at children who were wasted early in life, and looked at stunting. They observed that as wasting occurred, there appeared to be a dose-response relationship between wasting and stunting. They also found that those who had the largest amount of variability between the two measures were more likely to become stunted. Dr. Checkley's conclusions: interventions for early wasting may contribute to reduced stunting, and there may be other causes of stunting, other than wasting.

He then turned his attention to risks factors related to stunting during the first two years of life. In another study, they looked at multiple causes related to stunting among 1,800 children in 7 different countries from birth to 24 months. In 6 of the 7 countries, the data showed downward trajectories in growth velocity (with the exception of data from Fortaleza, Brazil). They looked at a series of maternal and neonatal variables, SES, micronutrients, diet, inflammation, infectious diseases, gut function, age and study site. They also looked at children at risk (-1 to -2 SD) and malnourished (>-2 SD). Overall, they saw increasing risk and prevalence with age, from about 7 to 18 months. The top five factors related to stunting included: 1) enrollment weight (larger children stayed larger); 2) maternal height; 3) non-diarrheal entero-pathogen detection; 4) WAMI index (WAMI= water and sanitation, assets, maternal education and income; these SES measures become more important as children age); and 5) percent energy from protein (lower rates resulted in more stunting). They did not find a relationship between diarrhea and stunting, perhaps because women are now getting treatment more quickly and effectively.

Enrollment weight and maternal weight were the most important predictive variables, and the other three variables became increasingly important over the 24 months.

Justine Kavle, MCSP

Justine reported the results of a recently published article she co-authored, Factors associated with early growth in Egyptian infants: implications for addressing the dual burden of malnutrition, funded through USAID's MCH Program.¹ In Egypt, 1 in 4 children are stunted, and 15% under 5 years of age are overweight; the classic double burden of malnutrition.

Background: Stunted children become stunted adults with decrease work capacity and increased risk of obesity and selected non-contagious diseases. There are also economic costs associated with long-term stunting. In lower Egypt, there was a doubling of stunting, associated with an outbreak of avian influenza. Her study allowed comparisons across areas with differential stunting rates. She described the study as having four parts: she focused for this presentation on follow up growth to determine differences in growth patterns and factors associated with growth, and the interplay between weight and height. For this they studied about 300 mother/infant pairs.

Key findings: There was some variation of mothers' characteristics between the upper and lower Egypt study areas. There was higher parity and age, with lower educational attainment in upper Egypt. In lower Egypt, the highest level of wasting was seen at birth, with cumulative increased stunting over time. In both areas, length velocity decreased and weight for length increased from 6 to 12 months of age. Overall, there appeared to be a cumulative increase in overweight with stunted children. In both areas, there was very limited dietary diversity. Minimum dietary diversity was associated with lower weight for length in lower Egypt, but not in upper Egypt. Diarrhea, fever and program exposure were not associated with any growth outcomes.

Implications: Overweight and stunting begin in the first year of life. In lower Egypt, 25% of infants studied were stunted, and about 30% were overweight. In countries like Egypt, infant and young child nutrition programs need to address both stunting and overweight through improving dietary quality and reducing reliance on energy-dense foods.

Amelia Reese-Masterson, IMC

This speaker addressed stunting and wasting in children under 2 years of age in a semi-pastoralist population in Kenya. The study's objective was to identify SES and health risk factors in children under 2 years of age that were associated with stunting and wasting. Initial factors to be measured were identified through a review of existing literature, and included: maternal height, weight, ANC inadequacy, enteric dysfunction, previous stunting, birth outcomes, infectious disease, poor IYCF, and diarrhea, among others. The study relied on SMART data collected during 2013.

Finding /interpretations: A total of 277 families were studied. About 13% of caretakers reported washing their hands at the 4 critical times; about 35% families used unsafe water; 61% did not have access to

¹ Kavle, J., et. al. Factors associated with early growth in Egyptian infants: implications for addressing the dual burden of malnutrition. Maternal and Child Nutrition, 2015.

toilets; fever and malaria were the two causes of highest morbidity; vaccination rates were high (>80%); health seeking behavior was reported to be poor (30% sought health for a sick child, mostly at public health clinics, largely ignoring local CHWs); most foods were purchased; there was very poor household dietary diversity; about 90% of mothers initiated breastfeeding with their youngest child within the first hour of birth, and 74% reported exclusive breastfeeding at 3 days. Wasting of children was reported for about 8% of the children, and was associated with a lack of access to toilets; other variables were not associated with wasting. About 28% were stunted, and it increased slightly over time. An unusual finding was that handwashing behaviors, and fever/malaria incidence were not correlated to stunting.

The presenter stated that there were “not strong findings here.” There was no strong relationship between stunting and wasting, except for those who were not involved with herding. There were some limitations of the data which the author reviewed. She concluded by stating that WASH practices need to be improved, as well as the need to address low health seeking behavior, and increased dietary diversity. She recommended increased integration of programming for RH, WASH, nutrition and management of infectious diseases.

Discussion

Three topics were addressed. Dr. Checkley discussed the content of the WAMI measure, and its utility (high). There was a question about the importance of measuring protein in addition to just measuring dietary diversity, with the presenters agreeing with this suggestion. There also was a discussion about the importance maternal mental health and depression, and how that might be measured in other studies of malnutrition.