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Lead Author
Vaman Khadilkar

Co-Author
Nimisha S Dange

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IAP HSG 2022-23

The Concept of Composite Index of Anthropometric Failure (CIAF): Revisited and Revised

Vaman Khadilkar[1], Nimisha S Dange[2]

Senior Consultant, Pediatric Endocrinologist, Jehangir Hospital, Pune, India[1]
Clinical and Research Fellow, Pediatric Endocrinology, Jehangir Hospital, Pune, India[2]

BASED ON ARTICLE

ABSTRACT

Estimation of total undernutrition with summation of Gomez and Waterlow's three class divisions in Svedberg formulated composite index of anthropometric failure (CIAF) and Nandy's revised CIAF have underestimated the prevalence of stunting with overweight children and only overweight children. The present report proposes a new scheme which would accurately estimate the prevalence of anthropometric failure (both under as well as overweight). This new classification will help in better estimating the dual burden of malnutrition among children.

Keywords
Anthropometric Failure; Underweight; Stunting; Wasting

COMMENTARY

Conventional indicators of malnutrition reflecting chronic malnutrition by stunting (low height for age), wasting (low weight for height) and underweight (low weight for age) were unable to provide a comprehensive picture of the overall burden of malnutrition in the population. To fill in these gaps and provide total magnitude of undernutrition, Svedberg in the year 2000, conceptualized the composite index of anthropometric failure (CIAF) model comprising six groups namely A, B, C, D, E and F (1). While group A was defined as no failure, remaining groups classified children based on failure in either a specific conventional indicator or combinations of them (double/ triple failure). Nandy et al introduced additional group Y containing only underweight children (2).

In its aggregated form, CIAF showed 61.8% prevalence of malnutrition in Indian under-five children using NFHS-5 data, proportionately higher than the prevalence of conventional indicators alone (stunting, wasting or underweight) (3). Specific failures as well as combination of failures in disaggregated form of CIAF might have greater predictive power than the conventional indicators. There is a well-established relationship between ill health and malnutrition using CIAF. The morbidity risk for children suffering from diarrhea and dysentery was around 50% and 80%, respectively, more

likely than children with no failures using CIAF whereas maximum risk was observed for children who experience a triple failure (stunted, wasted and underweight, in group D) (3). Children with triple failure were more likely to belong to families with poor wealth index in comparison with those having single failure. This revised Svedberg model has become a useful policy making tool for planners for designing intervention programs to reduce malnutrition in developing countries (4).

The terminology of CIAF was extended to include group G and H in the current review article with purpose to estimate over failure (over nutrition) and address the double burden of malnutrition (Table 1). Group G includes stunted children with overweight while group H includes only overweight children. Kuiti et al, further propose the revised summation formula for detecting under failure (undernutrition), over failure (over nutrition) and only normal children in a given population. In Argentina, extended CIAF recognized 50% under-five children with double burden in comparison with 22.1% undernourished children by CIAF classification (5). Prevalence of double burden of malnutrition was 55.8% using Indian Demographic and Health Survey (IDHS) 2015-16 data in under-five Indian children, highest among the South Asian region (6).

Table 1: The newly proposed categories of CIAF:

CIAF Categories	Wasted	Stunted	Underweight	Overweight
Group A -No failure	No	No	No	No
Group B - Wasted only	Yes	No	No	No
Group C - Wasted & Underweight	Yes	No	Yes	No
Group D-Wasted, Stunted & Underweight	Yes	Yes	Yes	No
Group E - Stunted & Underweight	No	Yes	Yes	No
Group F - Stunted only	No	Yes	No	No
Group G-Stunted & Overweight	No	Yes	No	Yes
Group H - Overweight only	No	No	No	Yes
Group Y - Underweight only	No	No	Yes	No

In summary, considering the rising prevalence of overweight/obesity even in rural areas, extended CIAF can be a useful screening tool at the community level for evaluating double burden of malnutrition and for implementation of national health programs.

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