Mini Review

‘ELIZ Modified IMPACT’ – A Tool for Under Nutrition&Obesity- The Dual Burden of Malnutrition

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Abstract

Assessment and care plan for children with malnutrition; both under nutrition and obesity are the need of the hour. This is in the context of 1/3rd of the global children having under nutrition, 1/3rd obesity only the rest having normal weight. A large majority; whether underweight, overweight or normal weight have micronutrient deficiencies. Various malnutrition assessment tools are available; which focus mainly on anthropometry and current diseases. As part of Nutrition Education Program (NEP) in India, a holistic ‘ABCDEF assessment scale’ was proposed, with aspects covering anthropometric, biochemical/labs, clinical, dietary, ecological/environmental and functional parameters. In the evaluation of quality of life and plan for intervention, a tool called ‘IMPACT’ (IAP’s Malnutrition Proactive Assessment-A Comprehensive Tool) was developed.

Based on creative suggestions to capture both under nutrition and obesity in a single tool and incorporating experiences from piloting the tool, ‘ELIZ Modified IMPACT’ – A Tool for Under nutrition& Obesity was developed and is presented to address the dual burden of malnutrition.

Key Words: Dual Burden of Malnutrition; ABCDEF Assessment; IMPACT Assessment Tool; ELIZ Modified IMPACT- A Tool for Under Nutrition& Obesity

Introduction & Background

Gabriela Mistral, the Nobel Laureate from Chile wrote, “We are guilty of many errors and many faults, but our worst crime is abandoning the children, neglecting the fountain of life”. Even after six decades of this thought provoking writing, many global countries are unable to tackle the burden of under nutrition. It is a paradox to note that, even when under nutrition and anemia are rampant, the global overweight and obesity pandemic is affecting developing countries as well. Hence, the morbidity and mortality of infants and children in the multi-burden countries like India are unacceptably high. It is right time to make objective assessment of the situation and plan holistic intervention by empowering the pediatricians and general practitioners and also Para medicals, health workers, health activists and community volunteers. This shall help to accomplish the sustainable development goals. It is also important to consider the changing profile of malnutrition occurring independent of illiteracy, poverty and ignorance as well as obesity occurring independent of extreme affluence; mostly due to wrong information and wrong practices [1]. It is gratifying to note that, Nutrition Education Program (NEP) has been initiated in countries like India. The truth is that the globe cannot achieve the goals without India conquering it, in view of the large population [2].

Malnutrition is often a man-made disease; more often due to faulty nurture and not by nature. By getting ourselves sensitized about the burden and assessment of malnutrition, we are expected to conquer more than 50% of the way ahead. By concentrating on three basic things like Breast feeding & IYCF practices, Immunization coverage and Growth monitoring, one can become “BIG” and make sizeable contribution with respect to prevention and early intervention [3]. Various malnutrition assessment tools are available; which focus on anthropometry and current diseases, but do not follow a holistic approach [4,5].

In the crusade against malnutrition, a holistic ‘ABCDEF assessment scale’ was proposed, with aspects covering Anthropometric, Biochemical/labs, Clinical, Dietary, Ecological/Environmental and Functional parameters[6]. In the evaluation of quality of life and plan for intervention, a tool called ‘IMPACT’ (IAP’s Malnutrition Proactive Assessment-A Comprehensive Tool) was created [6]. Based on the need to address both under nutrition and obesity, this was further modified and is presented.

Methods

The ABCDEF components of the IMPACT tool were pilot tested and validated. Based on creative suggestions to capture both under nutrition and obesity in a single tool and based on the experiences form piloting the tool, ‘ELIZ Modified IMPACT’ A Tool for under nutrition& obesity was developed to address the dual burden of
malnutrition. The tool is presented in view of its holistic approach and is open for a multicentric usage and validation.

The ‘ABCDEF’ Components

(A) Anthropometric Measurements

Community screening using weight-for-age shall be undertaken to pick up all underweight and overweight/obese children. They shall be further evaluated using height-for-age for short stature/tall stature and also weight-for-height and BMI for wasting/obesity.

(B) Biochemical & Laboratory Parameters

Baseline investigations; complete blood counts, type and severity of anemia, presence of malarial parasite, serum protein, serum albumin, liver enzymes for associated fatty liver disease, blood urea, serum creatinine, sepsis screen and HIV ELISA are recommended before starting appropriate intervention. Blood sugar, lipid profile, thyroid function tests, chromosomal/genetic tests and others may be decided on a case to case basis.

(C) Clinical Features

Features of extreme wasting as evidenced by loose skin folds in axilla, groin, thigh, buttocks, chest, back and loss of buccal pad of fat, excess adipose tissue, lipomastia/gynecomastia, nutritional bipedal edema, elicited by pitting on dorsum of foot using finger pressure for a few seconds, skin changes; nutritional dermatosis, acanthosis nigricans, hair changes and specific micronutrient deficiency signs should be recorded systematically.

(D) Dietary Evaluation

Nutrition during the first 1000 days of life; 270 intrauterine days and 730 first post-natal days up to two years of life, should be interrogated. Being the basis for future nutrition, health, immunity and diseases, baseline information regarding the well-being in utero evidenced by the birth weight, breastfeeding and complementary feeding practices and other IYCF components, including care of the mother during pregnancy and adolescent period should be recorded.

(E) Ecological and Environmental Data

The ecology of malnutrition being multifactorial; ranging from illiteracy, poverty, ignorance, abrupt stoppage of breastfeeding, early or late complementary feeding, over dilution of feeds, wrong information, quick transition to obesogenic junk food, lack of awareness, child neglect, child abuse, lack of parental harmony and care. Lack of environmental factors like safe drinking water, disposal of waste and excreta, air pollution, radiation exposure and biologic hazards, these are also to be captured.

(F) Functional Assessment

Morphological assessment for > 70% mutilated or unrepaired cells in buccal smear, delayed bone age on radiological assessment, night blindness due to vitamin A deficiency, and delayed gross motor milestones due to muscle wasting and hypotonia, shall be undertaken.

The various components and the ways of assessment and

| A. Anthropometry                           | Score | Assigned Score |
|--------------------------------------------|-------|----------------|
| Birth Weight                               |       |                |
| Normal                                     |       |                |
| VLBW <1.5Kg                                | 4     |                |
| LBW <2.5 Kg                                | 3     |                |
| LGA > 4 Kg                                 | 2     |                |
| If underweight- Weight for Length          |       |                |
| Weight for Height                          |       |                |
| < 70%/1st centile/                         | 5     |                |
| < 3 Z score (Severe Acute Malnutrition- SAM)|       |                |
| < 80%/3rd centile/                         | 4     |                |
| < 2 Z score (Moderate Acute Malnutrition- MAM)|       |                |
| < 90%/5th centile/                         | 3     |                |
| < 1 Z score (Underweight- Mild wasting)    |       |                |
### If overweight-

| BMI | Description | Score |
|-----|-------------|-------|
| > 99th centile/ | > 3 Z score  
(Morbid Obesity) | 5 |
| > 97th centile/ | >2 Z score  
(Obesity) | 4 |
| > 95th Centile/ | > 1 Z score  
(Overweight) | 3 |
| > 85th centile | (Risk for obesity) | 2 |

### Cumulative Score

#### B. Biochemical & Labs

| Parameter | Score |
|-----------|-------|
| Moderate- Severe Anemia | 4 |
| Any one micronutrient deficiency | 3 |
| Serum albumin < 3g/dl | 4 |
| Any one abnormal lab Parameter (sugar, RFT, LFT, Lipid profile) | 4 |

### Cumulative Score

#### C. Clinical

| Parameter | Score |
|-----------|-------|
| Nutritional edema | 5 |
| Visible wasting  
(Loose skin folds) | 4 |
| Skin changes  
(Nutritional dermatosis, Acanthosis nigricans) | 4 |
| Hair changes | 3 |

#### D. Dietary

| IYCF Practices | Score |
|----------------|-------|
| Not exclusively breastfed  
Up to 6 months | 2 |
| Not given semisolids at  
6 months | 2 |
| Not breastfed up to  
2 years | 2 |
| Not given family pot  
Feeding by 2 years | 2 |

### Current Diet
| Item                                                                 | Score |
|----------------------------------------------------------------------|-------|
| Not taking balanced diet                                            | 3     |
| Meeting > 80% RDA (US≥ 5 food groups, 5 colors, 5 times/day)        |       |
| HFSS- High Fat, Salt & Sugar Junk food daily                        | 4     |
| 4-6 days/week                                                        | 3     |
| 1-3 days/week                                                        | 2     |
| Sugary drinks/ colas daily                                          | 4     |
| 4-6 days/week                                                        | 3     |
| 1-3 days/week                                                        | 2     |
| Any food addictions/Picky eating                                    | 2     |

Cumulative Score

**E. Ecological/ Environmental**

| Item                                                                 | Score |
|----------------------------------------------------------------------|-------|
| Child abuse/neglect/labor                                            | 5     |
| Parental disharmony/Poor family support                             | 4     |
| Comorbidities (congenital/chromosomal/others)                        | 4     |
| Similar illness in the family                                        | 2     |

Cumulative Score

**F. Functional**

| Item                                                                 | Score |
|----------------------------------------------------------------------|-------|
| Developmental delay/disability                                      | 5     |
| Special sense organ defects (Vision, hearing, speech)               | 4     |
| Short/ Tall stature                                                 | 2     |
| Delayed bone age                                                    | 2     |

Cumulative Score

**Total Score**

*Total Score- > 44- Red Flags- Critically ill & ICU care
22-43- Close observation & Hospital care
11- 42- Close follow up & Ambulatory care
< 11- Periodic screening & Home Care*
assessment and care plan. As this was part of the National IAP Action Plan, 2015, Nutrition Education Program (NEP), 'IMPACT- IAP's Malnutrition Proactive Assessment- A Comprehensive Tool' [6], lot of creative suggestions were obtained and was later modified as the 'ELIZ Modified IMPACT’ A Tool for under nutrition & obesity-the dual burden of malnutrition.

The newly proposed 'ELIZ Modified IMPACT' is expected to pave the way towards a holistic thinking and behavioral change communication (BCC) in the most relevant field of child nutrition. This shall result in complete assessment and care of children with both under nutrition and obesity. The way towards behavioral change communication (BCC) in the most relevant field of child nutrition and result in early diagnosis and care of children with both under nutrition and obesity.

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