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Original Research Article

Incidence of Malnutrition among Infants below 5yrs in Shendi Town during 2013 - 2014

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Abstract

Malnutrition has been associated with increased morbidity and mortality. Therefore, the aim of the study was to find out the incidence of malnutrition among Infants Below 5yrs In Shendi Town during 2013 – 2014. A variety of methods were used by the pediatricians in Al-MakNimir Hospital and Shendi Emergency department to determine the nutrition status of Infants who were admitted. About 102 infants below the age of 5 years were investigated. Of the 102 infants 64/102(62.7%) of infants 1-2 years of age were found malnourished and 10/102 (9.8%) of infant 2-3 years of age were also found malnourished. Malnutrition is prevalent in Shendi particularly among younger infants 1-2 years of age.

Key words: Infants, Incidence, Malnutrition, Mortality, Shendi

INTRODUCTION

The World Health Organization (WHO) classifies malnutrition worldwide as the greatest threat to public health.According to the literature, malnutrition is prevalent in 20 - 60 % of patients on hospital admission (Imoberdorf and Ballmer, 2014).

Insufficient nutrition during the first two years of life may lead to childhood morbidity and mortality, as well as inadequate brain development. Infants are at increased risk of malnutrition by six months, when breast milk alone is no longer sufficient to meet their nutritional requirements (Fekadu et al., 2015). To describe trends in country- and individual-level dual burden of malnutrition in children <5 years, and age-stratified (<2 years, ≥2 years) country-level trends, in thirty-six low- and middle-income countries (LMIC).Overall malnutritionprevalence decreased in children<5 years, driven by stunting decreases. Stunting rates decreased in 78 % of countries, wasting rates decreased in 58 % of countries and overweight rates increased in 36 % of countries. Rates of change differed for children</≥2 years, with children <2 years experiencing decreases in stunting in fewer countries yet increases in overweight in more countries. Countries with nearly equal prevalence's of stunting and overweight in children <5 years increased from 2000 to the final year. Within a country, 0·3-10·9 % of children<5 years were stunted and overweight, and 0·6-37·8 % of stunted children<5 years were overweight.The dual burden exists in children<5 years on both country and individual levels, indicating a shift is needed in policies and programmes to address both sides of malnutrition. Children<2 years should be identified as a high-risk demographic (Sarmiento et al., 2014; Tzioumis et al., 2016). Malnutrition is prevalent in mechanically ventilated children on admission to Pediatric Intensive Care Unitsworldwide. Classification as underweight or obese was associated with higher risk of hospital-acquired infections and lower likelihood of hospital discharge. Underweight children had a higher risk of mortality and fewer ventilator-free days (Bechard et al., 2016; Malnutrition is common in Ugandan children with cerebral palsy, particularly those over the age of five and those who had neonatal complications. ActaPaediatr., 2015). Malnutrition also increases the risk of infections from different etiological factors (Ndir et al., 2016). Protein quality refers to the amounts and ratios of essential amino acids in a food. Two methods most commonly used for determining protein quality are the protein digestibility-corrected amino acid score

(PDCAAS) and the digestible indispensable amino acid score (DIAAS) (Manary et al., 2016). The FAO has recommended replacing the protein digestibility-corrected amino acid score (PDCAAS) with the digestible indispensable amino acid score (DIAAS) (Rutherfurd et al., 2015).

Understanding the levels and trends of the leading causes of death and disability among children and adolescents is critical to guide investment and inform policies. Monitoring these trends over time is also key to understanding where interventions are having an impact. Proven interventions exist to prevent or treat the leading causes of unnecessary death and disability among children and adolescents (Global Burden of Disease Pediatrics Collaboration et al., 2016). Therefore, the objective of this study was to determine the burdenmalnutrition among Infants Below 5yrs in Shendi Town, Sudan during one year time.

MATERIALS AND METHODS

This is a hospital based study (all infants referred for malnutrition assessment) investigated 102 infants below the age of 5 years who were admitted to the department of pediatric in Al-MakNimir Hospital and Shendi Emergency department to determine nutrition status (suspected as having malnutrition).A variety of methods were used by the pediatricians in Al-MakNimir Hospital and Shendi Emergency Department to determine the nutrition status of Infants who were admitted. These methods include:

-Anthropometric Assessment which comprises of measurements of variations of physical dimensions and gross composition of the body. These are of two types; 1-Growth and body composition, 2-Body composition measurements involve measurement of fat free mass and body fat i.e. the two major compartments of body mass.

-Growth measurements; the most widely used anthropometric measurements of growth are those of the stature, (Height and length) and body weight.

- Body weight: Body weight represents the sum of proteins, fat, water and bone mineral mass. Hence changes in body weight reflect a change in one or more of these chemical compartments.

-Recumbent length and stature; the distribution of weight and height at a given age within most populations is usually narrow.

-Weight for height: This index has been recommended by the world health organization (WHO) instead of weight for age because it differentiates between nutritional stunting, when weight may be appropriate for height, and wasting when weight is low for height as a result in deficits in both tissue and fat mass.

-Length- or height for age; this index is also recommended by WHO to detect stunted children in relation to combination in weight and height.

-Quetelet's index; Body mass index for age(BMI for Age). This is calculated from the formula weight/height^2 /Age. It is the least biased by height and easily calculated.

Body composition measurements

-Mid arm upper circumference (It's Mid upper arm circumference – MUAC-); In Al-MakNimir hospital MAUC is used as a reflection in the diagnosis of protein energy malnutrition. It's frequently used when the child's age is uncertain.

-Skin fold thickness; these measurement are said to provide an estimate of subcutaneous fat depot, which in turn provides an estimate of the total body fat. Such estimates are based on two assumptions.

This study mostly depended on: weight-for-height and body mass index-for-age

Data analysis: The data was analyzed using computer software (statistical package for social sciences (SPSS) (version 16)) and frequencies and percentages and cross tabulations were produced. Chi square test with the 95% confidence level was used and P value less than 0.05 was considered statistically significant.

Ethical consent: Theprotocol of this studywas approved by the scientific committee boardat College of Medicine, University of Shendi, and then permission was taken from general hospital manger and the head of nursing department. The purpose of the study was explained verbally to infant's relatives and they all agreed to participate.

RESULTS

This study investigated 102 infants, their ages raging between 1 to 5 years with a mean age of 2.5 years.The great majority of infants were in age range 1-2 years, followed by 2-3 years, 3-4 and 4-5 years, constituting (58%), (23%), (10%), and (9%), respectively, as shown in Figure 1 of the 102 infants, 52/102 (50.9%) were males and 50/102(49.1%) were females, giving males' females' ratio of 1.04: 1.00.

The overall incidence of infants with malnutrition (cases) was found to be 64/102(62.7%).Of the 64 cases of malnutrition, the incidence rates were 33/64(51.6%) for males and 31/64(48.4%) for females.The highest incidence of malnutrition was found among infants in age range 1-2years, followed by 4-5 years, 3-4 years, and 2-3 years, representing 40/64(62.5%), 11/64(17.2%), 7/64(10.9%), and 6/64(9.4%), respectively, as indicated in Figure 2

About 98.5% of infants admitted in the pediatric ward had at least a malnutrition related risk factor. Infants whose meal plans were at least 3-4 meals or above had the lowest incidence of malnutrition.

Gastro intestinal tract infections and poor weaning

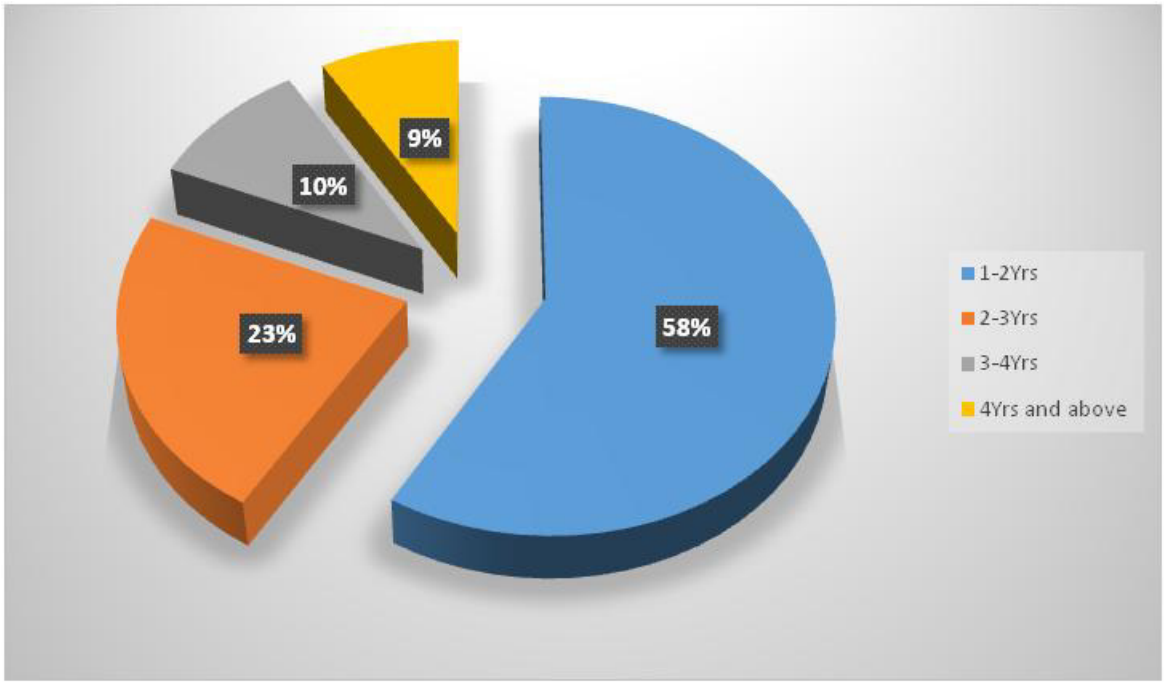

Figure 1. Description of the study population by age.

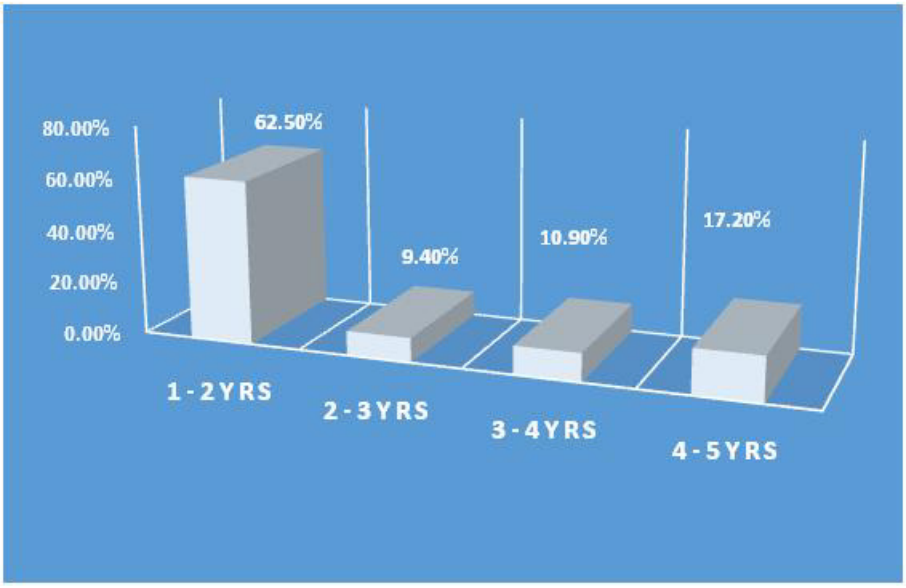

Figure 2. Description of incidence rates of malnutrition by age.

practices were the leading cause of malnutrition in Shendi Town. The best intervention practices of controlling malnutrition in infants under 5 years in Shendi town was proper weaning practices (43.8%) and good nutrition practices (15.6%). Infants born to mothers who had an education experience were at lower risks of getting malnutrition disorders compared to non-educated infants' mother, (P=0.026). Severity of malnutrition reversely increases with the decrease of family income.

There is a directly proportional relationship between number of family members and infant malnutrition. Families with more than 6 members had the highest incidence of malnutrition compared to families with lower members.

About 1.6% of malnutrition cases had a medical history of measles infection. Results reveal that there is a relevant relationship between the child's appetite and risk of getting malnourished. This was proven by determining

some of children's appetite with Ready to Feed Therapy (RUTF).

DISCUSSION

The incidence rate of malnutrition is very high among children admitted to the pediatric hospitals in Shendi town, particularly the younger children and the incidence of malnutrition in male and female infants was relatively the same. This is probably due to poor deity substitutes after weaning at this age. Most of the mothers wean off their kids from breast feeding at the age of 1.5-3 years.The criteria to determine an optimal feeding was depending on, Feeding history, Appetite and intake, Diet history, and Socioeconomic background.

However, there a lack of studies in this context from Sudan. In a recent study from Sudan medical files of children with severe malnutrition admitted at New Halfa hospital, Sudan during 2007-2009 were reviewed. A total of 1097 children (54.9%, 602 male) with severe malnutrition were admitted during the three year period. Oedematous severe malnutrition was found in 179 (16.3%) children. Of these 1097, 796 (72.6%) patients with severe malnutrition were children <2 years old. Out of these 1097 children, 780 (71.1%) and 112 (10.2%) had diarrhoea and malaria, respectively. Sixty-one (5.5%) of these children died, 237 (21.6%) discharged against medical advice and 799 (72.8%) were discharged. Of the 61 children who died 11 (18.0%) had septicaemia following diarrhoea and respiratory tract infections. The case fatality rate was not different with sex or with presence/absence of oedema (Mahgoub and Adam, 2012). However, edema was not evaluated in the current study.

However the Incidence of malnutrition in uneducated mothers was high and this can be accounted for lack of knowledge concerning proper feeding practices and sanitation which are the two main Malnutrition predisposing factors in Shendi town. In poor hygienic conditions infants are prone to catch gastro intestinal tract infections which interfere with absorption of nutrients and appetite of the infants thus triggering malnutrition.There was a gross increase in the incidence of malnutrition with poverty or law income per capita of the families. Families with high income had the ability to provide the basic meals for their infants. In addition to this the living expenses of Shendi town are relatively highcompared to similar owns in Sudan.

Infants offered 4 or more meals had the least incidence of Malnutrition. Most of the child's needs of nutrients are availablewithin these meals.

There was a general increase in malnourished children with increase in Family population. This can be accounted to the fact that overcrowding leads to competition in terms of food and easy spread of communicable diseases which in turn affect the child's Nutrition trends. Results also show that the trend in malnutrition cases was higher among male infants compared to the female infants. This can explained as a result of family care in the Sudanese Home which concentrates on the girls more than the boys, though there was no significant statistical value. "A good psychological environment also had a nutritional role in children. Whenever kids play well, live a happy life and health minds, they feed well"

In conclusion: These results show that malnutrition is still a serious public health problem in Shendi Town and requires urgent attention. Well thought out and targeted intervention programs are long overdue. The results of this survey and others emphasize the importance of having a well-established surveillance system which would ensure necessary and timely action.

Furthermore, it recommended that Health Canters of Shendi to try to expand the programs of Health Education to the mothers because and according to the results there was a great relationship between Mothers knowledge and Infant malnutrition.

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