

Short Communication

PREVALENCE AND RISK FACTORS OF UNDER NUTRITION AMONG UNDER FIVE CHILDREN IN A RURAL COMMUNITY

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Abstract :

Children of today are citizens of tomorrow; the young child under 5 years is most vulnerable to the vicious cycles of malnutrition, infection and disability all of which influence the present condition of a child and the future human resource development of the nation as a whole. Hence the assessment of the ground reality as reflected by the statistics on nutritional status of children becomes very significant in this context.

The study was done to determine the prevalence of under-5 under nutrition and to identify the major child factors contributing to the development of under nutrition among the under 5 children.

This was a cross sectional study conducted in the rural community of Nitte, a field practice area of Department of Community medicine, K S Hegde Medical Academy among all the children of the anganwadis under ICDS scheme. A total of 133 under 5 children were assessed for their nutritional status and the factors that affect nutritional status.

The overall prevalence of under-5 under nutrition was found to be high at 63.16%. More girls were undernourished compared to boys, lower grades of undernourishment were more common and the prevalence of under nutrition increased with increasing age. There was a higher prevalence of underweight in children born with low birth weight, born premature, those children not exclusively breast fed and on improper complementary feeds. Immunization and Vitamin A supplementation of the under-5 children status was highly satisfactory.

Keywords : Under nutrition, under-5 children, ICDS

Introduction :

Early childhood, that is the first six years constitutes the most crucial period in life, when the foundations are laid for cognitive, social and emotional language, physical/motor development and cumulative lifelong learning ^[1]. Childhood under nutrition is a critical public health and development challenge in many developing countries including ours ^[2]. An estimated forty per cent of the world's

severely malnourished under-5 children live in India ^[3] and one in every three malnourished child in the world lives in India ^[4]. Under nutrition encompasses stunting (chronic under nutrition),

wasting (acute under nutrition) and deficiencies of micronutrients (essential vitamins and minerals). The level of child under nutrition is unacceptably high in almost all states, except some like Goa, Kerala, Manipur, Mizoram, Punjab and Sikkim. More than 6,000 Indian children below the age of five die every day due to malnourishment or lack of basic micronutrients such as vitamin A, iron, iodine, zinc or folic acid.

The causes and impact of childhood under nutrition are complex and manifold. An individual will experience under nutrition if the appropriate amount or quality of nutrients is not consumed for an extended period of time. The problem is multifaceted, the causes acting singly or in combination with other complex factors like poverty, purchasing power, health care, ignorance on nutrition and

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health education, female illiteracy, social convention etc. Besides being associated with high rates of mortality and morbidity, it is also an underlying factor in almost one-third to half of all under five deaths due to preventable causes.

A failure to combat child malnutrition reduces potential economic growth at the macro level. At the micro level, malnutrition both protein energy malnutrition and micronutrient deficiencies directly affects children's physical and cognitive growth and increases susceptibility to infection and diseases with frequent episodes of illness and longer recovery period ending up in growth retardation and poor cognitive development. Long term impact on education attainment may occur in correlation with stunting and iron deficiency anaemia. Without adequate care, such children also fail to reach their full potential due to irreversible effects beyond the first two years of life.

Some of the terms used to denote under nutrition include underweight, stunting and wasting which are measured by anthropometry. The percentage of children below 5 years classified as malnourished according to these three anthropometric indices of nutritional status in India as revealed by NFHS 3 (2005-06) is indicative of the significant malnourishment among Indian children. According to NFHS survey, 43 percent children under age of five years are underweight (low weight for age), 48 percent children under five are stunted (low height for age). 20 percent children under five years of age are wasted (low weight for height). Over 6 per cent of these belong to a category called Severe Acute Under nutrition or SAM (<-3SD).

The present study was undertaken to study the prevalence of under five under nutrition and to identify the major child factors contributing to the development of under nutrition among the under 5 children.

Material and Methods :

A cross sectional community based study was done in rural community of Nitte with universal sampling of all the anganwadis during the time period of August to September 2012.

Sample size was determined to be 200 with formula $4pq/L^2$ taking the prevalence of underweight as 15% and allowable error of 5% ($p=15$, $q=100-15$ and $L=5$)

We determined to survey all anganwadis in and around Nitte and recruit all the children for the study, but due to various logistic reasons like rainy season and various festivals during the study period, attendance in Anganwadi was very low, hence we could get a sample only of 133 under-5 children.

The anganwadis were visited and the mothers of the children were asked to come on a particular day and the anganwadis were revisited on that day; the study was undertaken with informed consent of the parents. Pre tested proforma with face validity and linguistic validation were used to identify the child factors like birth weight, breast feeding, complementary feeding, maturity status at birth, immunization and vitamin A supplementation. Children were examined for weight, height, mid arm circumference, head circumference and chest circumference.

Under nutrition is defined as underweight (weight for age < 2 SD), wasting (weight for height < 2 SD) and stunting (height for age < 2 SD) as per national guidelines⁽¹⁾. Weight-for-age is a composite index of height-for-age and weight-for-height and has been used to measure under nutrition in the present study and the grades of under nutrition here were defined as per IAP classification

Results :

A total of 133 under-5 children were surveyed of which a majority of 84 children were undernourished (63.16%). Out of the survey population, 77 (57.89%) were girls and 56 (42.01%) were boys. 55 girls (71.43%) and 29 (51.8%) of boys were undernourished, showing a higher prevalence in girls as compared to boys. Majority of the undernourished were females (65.47%).

57 out of 133 children had grade 1 under nutrition. There was a higher prevalence of grade 1 under nutrition (42.8%) compared to grade 2 (18.7%) and grade 3 under nutrition (1.5%). Majority with 40 (47.6%) of the undernourished

children belonged to 4-5 yrs age group and the prevalence of under nutrition increased as the age increased above 1 year age with the maximum prevalence of 68.9% seen in 4-5 year age group. However infants had a higher prevalence of under nutrition at 66.7%.

Majority (109 under-5, 81.95%) of the surveyed under-5 children were born with normal birth weight (>2.5 kgs). The prevalence of under nutrition was higher among the children born with low birth weight with 18 (75%) being undernourished among the low birth weight compared to 66 (60.6%) of 109 normal birth weight children.

A majority of 122 (91.72%) children among the survey population were born mature or term while 11(8.3%) were born premature. The prevalence of under nutrition was higher among those born premature at 72.7% as compared to those born mature at 62.3%, grades 2 and 3 was more common among premature but this difference was not

seen in case of grade 1 malnutrition.

Out of the 133, a majority of 114 (85.7%) children had been exclusively breast fed. The proportion of under nutrition was almost similar in the two categories with 62.3% of exclusively breast fed and 68.4% of the children not exclusively breast fed being undernourished.

Among the children who have been weaned, under nutrition was found to be more prevalent amongst children who are fed only rice as complimentary feed (percentage difference of 18%) and lesser among those who are given mixed feed (4%) while no difference was found between normal or malnourished children fed with cerelac based feeds.

100% of the surveyed children were immunized for age and received adequate vitamin A supplementation.

Table 1 : Distribution of under nutrition according to gender and birth weight

		Undernourished	Normal	Total
Gender	Male	29(51.78%)	27(55.1%)	56(42.01%)
	Female	55(71.42%)	22(44.89%)	77(57.89%)
	Total	84(63.15%)	49(36.84%)	133
Birth weight	<2.5kgs	18 (75%)	6 (25%)	24 (18.04%)
	>2.5kgs	66 (60.55%)	43 (39.44%)	109 (81.95%)
	Total	84(63.15%)	49(36.84%)	133

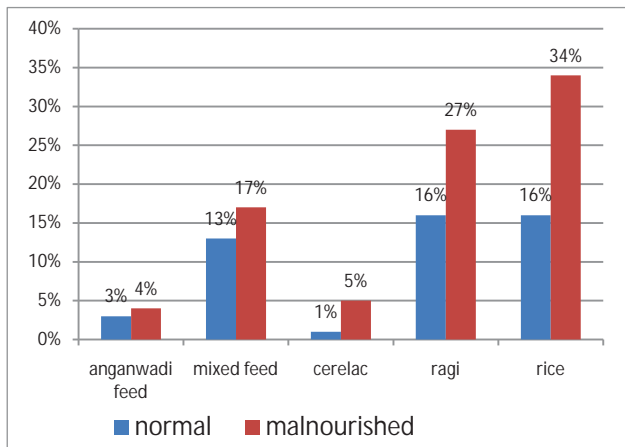
Table 2 : Distribution of under nutrition according to age

	Grade of under-nutrition	Age group					Total
		0-1	1-2	2-3	3-4	4-5	
	1	2 (3.5%)	3 (5.2%)	12 (21.05%)	19 (33.33%)	21 (36.8%)	57(42.8%)
	2	0	0	2 (8%)	5 (20%)	18 (72%)	25 (18.7%)
	3	0	0	1 (50%)	0	1 (50%)	2 (1.5%)
	nil	1 (2 %)	3 (6.1%)	14 (28.5%)	13 (26.5%)	18 (36.7%)	49 (36.8%)
	Total	3(0.2%)	6 (0.4%)	29 (2.18%)	37 (27.81%)	58 (43.6%)	133

Table 3: Distribution of under nutrition according to maturity at birth and breast feeding practices

	Maturity at birth	Grade of under nutrition				Total	
		1	2	3	nil		
	Mature	54 (44.26%)	21 (17.21%)	1 (0.8%)	46 (37.7%)	122 (91.7%)	
	Premature	3 (27.3%)	4 (36.36%)	1 (9.09%)	3 (27.3%)	11 (8.28%)	
	Total	57 (42.85%)	25 (18.79%)	2 (1.5%)	49 (36.84%)	133	
	Breast feeding	Exclusively breast fed	47 (41.23%)	22 (19.29%)	2 (1.75%)	43 (37.7%)	114 (85.71%)
		Not exclusively breast fed	10 (52.6%)	3 (15.7%)	0	6 (31.57%)	19 (14.28%)
		total	57 (42.85%)	25 (18.79%)	2 (1.5%)	49 (36.48%)	133

Figure 1: Distribution of under nutrition according to complementary feeding



Discussion :

The Integrated Childhood Development scheme (ICDS) developed with the concept of providing a package of services is based primarily on the consideration that the overall impact will be much larger if the different services develop in an integrated manner as the efficacy of a particular service depends upon the support it receives from related services delivered through public health infrastructure mainly in the anganwadi centres under the Ministry of Health & Family Welfare. This is at present India's response to the challenge of breaking the vicious cycle of malnutrition, morbidity, reduced learning capacity and mortality. Services include supplementary feeding and growth monitoring; and prophylaxis against vitamin A deficiency, Immunization, Referral Services and Non-formal Pre-School Education. The present study has focussed on under 5 children in such anganwadi centres and thereby strives to study the impact of ICDS services in the rural community.

The present study found the prevalence of under 5 under nutrition (underweight) to be 63.16% which is comparable to another study^[5] done in rural Bangalore by Bobby Joseph et al among 256 rural children aged 12-60 months which found that about 70% of the children were malnourished (wasting, stunting, or both) but much higher than the state average of 37.6% for under-3^[6] and the national average of 43%. This could be due to the fact that the present study was restricted to a rural area wherein majority of the

households belonged to classes 2, 3 and 4 socioeconomic status according to modified Kuppaswamy scale and a direct relationship between poverty or low socio economic status and under nutrition is well known. It also could be because malnourished were asked to come to the anganwadi and were more likely to be present as compared to normal children who missed due to it being rainy season.

A house to house cross sectional survey^[7] in rural UP by H S Joshi et al found the overall occurrence of PEM in under 6 years children to be 49.44% which is slightly lower than the present study, however it was found to be significantly higher (64.87%) in the age group of 3-6 years which corroborates with our study which also showed higher prevalence in higher age groups. The proportion of grade I, II, III and IV of under nutrition observed was 45.49%, 38.30%, 14.86 and 1.35% respectively. Prevalence of under nutrition was 39.92 % (99 out of 248) in males and 61.19% (123 out of 201) in females. The pattern of severity of malnutrition and gender distribution is similar to our study. The gender difference in under nutrition with females having higher prevalence has been found in several other studies both at regional^[8,9,10] and national levels^[11]

Age distribution of under nutrition in the present study shows that the prevalence increases with increasing age but with a significant higher prevalence in infancy. This is similar to some other studies^[8] but contrasts with yet some studies^[11] which show low proportion of underweight among infants. This may be due to other confounding factors in infancy like birth weight and other environmental factors.

Our study showed higher proportion of underweight among low birth weight (though associations have not been explored) and improper rice based complementary feeds. This is similar to a study^[9] done in 4 selected anganwadi areas in UP by Dinesh kumar et al which found that improper complementary feeding is a significant (P<0.05) risk factor for underweight. However exclusive breast-feeding was not found a significant correlate of nutritional status in the study. However in contrast to our study the proportion of underweight was lower at 36.4%

and the maximum proportion of underweight (45.5%) occurred among children aged 13-24 months. In the present study exclusive breastfeeding for the first 6 months was done in a majority of 85.7% children which is higher than the Karnataka statistical average of 59% and majority of the children who were not exclusively breast fed were undernourished similar to earlier studies.

The present study showed 100% immunization for age of the under 5 children surveyed, much higher than the national average of 61% among children aged 12-23 months, higher than the coverage of full immunization in Karnataka of 78%^[11] and higher than 55% of 12-23 months aged children that are fully vaccinated against six major childhood illnesses in Karnataka^[12]. 100% of under 5 children in the present study have received vitamin A supplementation which again is higher than the state average of 23 percent of last-born children age 12-35 months, and 53 percent of children age 6-35 months^[12]. These may be attributed to the higher female education status in Dakshina Kannada and Udupi districts.

The prevalence of low birth weight in the present study (18.1%) is almost similar to the national average of 22.5% as estimated by NFHS 3^[13], and prevalence of under

nutrition was more common among those born with low birth weight similar to other studies^[11]

Some of the limitations of the study are that we have not explored maternal factors like maternal BMI and antenatal care, socio demographic factors and other environmental factors which also play significant role in childhood under nutrition. Because of logistic reasons, we could not meet the adequate sample size.

Conclusion :

Prevalence of under nutrition is higher than the state average in spite of low birth weight prevalence being comparable to that of the state, high female education status with 100% immunisation and higher proportion of exclusive breast feeding. We thus attribute the major factor leading to under nutrition as defective complementary feeding. Hence we recommend proper maternal education on the right time of initiation and the right type of complementary feeds.

Acknowledgements :

I acknowledge the interns who helped me in the data collection (Dr Jazeela B. R, Dr Dipthi N, Dr Dipti K) and the anganwadi workers for their kind cooperation.

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