International Journal of Medical and Health Research
ISSN: 2454-9142
Received: 25-10-2019; Accepted: 26-11-2019; Published: 28-12-2019
www.medicalsciencejournal.com
Volume 5; Issue 12; 2019; Page No. 195-199

Evaluation of factors responsible for the malnourished childrens admitted to DMCH Darbhanga

Dr. Binit Singh[1], Dr. Ved Prakash Gupta[2*]
[1, 2] Senior Resident, Department of Pediatrics, Darbhanga Medical College and Hospital, Laheriasarai Darbhanga, Bihar, India
[*] Corresponding Author: Dr. Ved Prakash Gupta

Abstract
The group most vulnerable to malnutrition and its adverse effects is children below five years, who constitute a special risk group in any population. Their nutritional requirement is disproportionately higher for body weight than older children and adults. There is strong evidence that malnutrition is associated with impaired growth, delayed mental development, poor school performance and reduced intellectual capacity. Thus even mild malnutrition in children can affect their long term intellectual ability, brain development and can predispose them to infections push them further into severe malnutrition. Hence based on above findings the present study was planned for Evaluation of Factors Responsible for the Malnourished Childrens Admitted to DMCH Darbhanga.
The present study was planned in Department of Pediatrics, Darbhanga Medical College and Hospital, Laheriasarai Darbhanga, Bihar, India. The study was conducted from the March 2019 to July 2019. In the present study total 25 cases of the malnourished childrens were evaluated and discussed as below. Study was conducted with the help of pre-tested proforma. Each child was examined clinically &the important laboratory findings were noticed from the case sheet. Malnutrition was classified according to Indian academy of pediatrics (IAP) classification. This IAP classification based on weight-forage values. The standard used in this classification for reference population was the 50thcentile of Harvard standards.
The data generated from the present study concludes that major epidemiological risk factors are Low birth weight, Low socio-economic status, illiteracy & low educational status among mothers, Improper breast feeding & complimentary feeding practice, Anemia during pregnancy in mothers, Improper birth spacing, high birth order., living in tribal, rural & urban slum areas. & the most of malnourished children were anaemic & suffering from diarrheal illness.

Keywords: malnourished, childrens, below 5 years, Bihar, Gaya, etc

Introduction
The level of child under nutrition remains unacceptable throughout the world, with 90 per cent of the developing world's chronically undernourished (stunted) children living in Asia and Africa. Detrimental and often undetected until severe, under nutrition undermines the survival, growth and development of children and women, and diminishes the strength and capacity of nations. With persistently high levels of under nutrition in the developing world, vital opportunities to save millions of lives are being lost, and many more millions of children are not growing and developing to their full potential. Nutrition is a core pillar of human development and concrete, large-scale programming not only can reduce the burden of under nutrition and deprivation in countries but also can advance the progress of nations.
In India 20 per cent of children under five years of age suffer from wasting due to acute under nutrition. More than one third of the world's children who are wasted live in India. Forty three per cent of Indian children under five years are underweight and 48 per cent (i.e. 61 million children) are stunted due to chronic undernutrition, India accounts for more than 3 out of every 10 stunted children in the world. Undernutrition is substantially higher in rural than in urban areas. Short birth intervals are associated with higher levels of undernutrition. The percentage of children who are severely underweight is almost five times higher among children whose mothers have no education than among children whose mothers have 12 or more years of schooling. Undernutrition is more common for children of mothers who are undernourished themselves (i.e. body mass index below 18.5) than for children whose mothers are not undernourished. Children from scheduled tribes have the poorest nutritional status on almost every measure and the high prevalence of wasting in this group (28 per cent) is of particular concern.
Undernutrition jeopardizes children's survival, health, growth and development, and it slows national progress towards development goals. Undernutrition is often an invisible problem.
There is a critical window of opportunity to prevent undernutrition by taking care of the nutrition of children in the first two years of life, girls during adolescence, and mothers during pregnancy and lactation – when proven nutrition interventions offer children the best chance to survive and reach optimal growth and development.
Optimal infant and young child feeding entails the initiation of breastfeeding within one hour of birth; exclusive breastfeeding for the first six months of the child's life; and continued breastfeeding for two years or more, together with safe, age-appropriate and hygienically prepared complementary foods starting at 6 months of age. There is growing evidence of the benefits to mother and child of early initiation of breastfeeding, preferably within the first hour after birth. Early initiation of breastfeeding contributes to reducing neonatal mortality.
It ensures early skin-to-skin contact, which is important in preventing hypothermia and establishing the bond between

the mother and her child. Early initiation of breastfeeding also reduces a mother's risk of post-partum haemorrhage, one of the leading causes of maternal mortality.

Colostrum, the milk produced by the mother just after delivery during the first post-partum days, provides protective antibodies and essential nutrients, acting as a first "natural" immunization for newborns, strengthening their immune system and reducing the chances of death in the neonatal period. Optimal complementary feeding is the most effective intervention that can significantly reduce stunting during the first two years of life.

A comprehensive programme approach to improving complementary feeding practices includes timely introduction of age-appropriate and hygienically prepared complementary foods, counseling for caregivers on feeding and care practices and on the optimal use of locally available foods, improving access to quality foods for poor families through social protection schemes and safety nets, and the provision of fortified foods and micronutrient supplements when needed. Vitamin and mineral deficiencies are highly prevalent throughout the developing world.

Anaemia in young children is a serious concern, because it can result in increased morbidity from infectious diseases and impaired cognitive performance, behavioral and motor development, coordination, language development, and school achievement. Vitamin A is essential for a well-functioning immune system; its deficiency increases the risk of mortality significantly.

Vitamin A supplementation twice yearly reduces the risk of blindness, infection, undernutrition and death associated with vitamin A deficiency, particularly among the most vulnerable children.

Iodized salt consumed as table salt and/or as food-grade salt (used in food processing) improves brain development; prevents motor and hearing deficits. Zinc given as part of Oral Rehydration Therapy for the treatments for diarrhoea reduces duration and severity of diarrhoea and subsequent episodes Hand washing with soap by caregivers' and children prior to food preparation and eating, serving foods immediately after preparation, using clean utensils and avoiding feeding bottles helps reduce diarrhoea and associated undernutrition in the child. Every adolescent girl must be protected against undernutrition and nutritional deficiencies like anaemia through dietary counseling, weekly iron and folic acid supplementation, twice yearly de-worming prophylaxis. In addition developing life-skills to avoid early marriage and early pregnancy is also vital. Every pregnant woman must have access to sufficient quality and quantity food including during pregnancy and lactation. Every pregnant woman and breastfeeding mother must take iron folic acid supplements daily to reduce maternal anaemia and improve pregnancy and lactation outcomes.

Regular consumption of salt with adequate levels of iodine is required by all pregnant women in order to prevent foetal brain damage associated with iodine deficiency. Significant disparity in nutritional status also exists in terms of mothers' education and literacy. A number of studies and analyses have found a significant association between low maternal literacy and poor nutrition status of young children.

In many developing countries, the low status of women is considered to be one of the primary determinants of undernutrition across the life cycle. Women's low status can result in their own health outcomes being compromised, which in turn can lead to lower infant birth weight and may affect the quality of infant care and nutrition. A study in India showed that women with higher autonomy (indicated by access to money and freedom to choose to go to the market) were significantly less likely to have a stunted child when compared with their peers who had less autonomy. Children who are undernourished, not optimally breastfed or suffering from micronutrient deficiencies have substantially lower chances of survival than children who are well nourished.

They are much more likely to suffer from a serious infection and die from common childhood illnesses such as diarrhoea, measles, pneumonia and malaria, as well as HIV and AIDS. According to the most recent estimates, child undernutrition contributes to more than one third of child deaths. Undernourished children who survive may enter the vicious cycle of recurring illness and faltering growth, with irreversible damage to their growth, cognitive development, school performance, and future productivity as adults [1].

Nutrition is a fundamental pillar of human life, health and development across the entire life span. The fundamental WHO goals of 'Health for All' means that people everywhere, throughout their lives, have the opportunity to reach and maintain the highest attainable level of health. This is impossible to attain in the presence of food insecurity and malnutrition problems. Good health is as essential to nutritional wellbeing, as good nutrition is crucial for maintaining healthy growth and development. Besides nutritional and vitamin deficiencies, rural and urban populace in the country also face lack of access to safe drinking water as well as sanitation facilities. Children 5 are the most valuable asset of a nation; their welfare and health is the edifice of sound and sustained economic development. An insufficient food intake and ignorance about nutrition coupled with low immunity ensure that the most vulnerable experience very fragile health. In this context, the greatest changes can occur only when there is an improvement in children's health and nutrition status. The health, nutrition, education and development opportunities given to a child at this stage to large extent determine his health and well-being for the entire life time. However, the preschool children receive low priority in policies and programmes in India in spite of all indicators showing that greater investments are urgently needed [2].

Investment in health can be considered under various heads i.e. the investment in the preventive and curative measures, and nutrition and population control. The preventive measures consist of routine immunization programmes like anti-cholera inoculation, anti-smallpox, vaccine, malaria eradication programme, tuberculosis campaigns and so on. Health and development are closely interlinked with poverty and hunger. As the National Human Development Report says in its most basic form- as a state of food deprivation and nutritional deficiency- poverty has a direct bearing on the morbidity and longevity of the people. Child malnutrition reflects a number of intermediary processes such as household access to food, access to health services and caring practices. A well-nourished child is more likely to stay in school and become educated, thereby improving lifetime earnings because of increased mental and physical capacity. In the long run, a well-nourished population can enhance the economic development of a country. It has been shown that the higher the levels of malnutrition or clinical indicators such as anaemia, the lower the overall

productivity. Therefore, good nutrition in children is crucial for achieving the goal of universal primary education as well as gender equity in education [3].

Since children are the most valuable asset of a nation, their welfare and health is the edifice of sound and sustained economic development. The most neglected form of human deprivation is malnutrition, particularly among preschool children. Malnutrition is associated with more than half of all deaths of children world-wide 6 [4]. Child development problems refer to problems of ill health, malnutrition, or inadequate psychosocial development, intellectual, social and emotional development. At least three factors are responsible for the rising interest in child development during the past few decades. Firstly, the increasing success of child survival programmes coupled with progress in economic development. Secondly, its failure results in reduced school performance, less productive labour force, and increased welfare and other social expenditures. Thirdly, International research findings give valuable inputs for giving more primacy to child development. Few countries also made major financial commitments to launch and expand child development programmes in the early 1980's. Taking this footstep, India implemented its Integrated Child Development Services (ICDS) and Effective Early Child Development programmes to combine interventions in health, nutrition and early education. The cross-sectoral approach is advocated in this regard partly because this makes sense to parents and children. A child is born without barriers and to achieve its full potential in life an integrated approach in the field of health, nutrition or education is required.

In keeping with its International commitment to the World declaration on the survival, protection and development of children, Government of India's Department of women and child development under the ministry of HRD formulated National plan of Action for children. Most of the recommendations of the World Summit Action plan are reflected in India's National plan of Action to fulfill the needs, rights and aspirations of 300 million children in the country. The priority areas in the plan are health, nutrition, education, water, sanitation and environment. The different strategies are required for addressing the health, nutrition and development needs of preschool children depending on their age.

The group most vulnerable to malnutrition and its adverse effects is children below five years, who constitute a special risk group in any population. Their nutritional requirement is disproportionately higher for body weight than older children and adults. There is strong evidence that malnutrition is associated with impaired growth, delayed mental development, poor school performance and reduced intellectual capacity. Thus even mild malnutrition in children can affect their long term intellectual ability, brain development and can predispose them to infections push them further into severe malnutrition. Hence based on above findings the present study was planned for Evaluation of Factors Responsible for the Malnourished Childrens Admitted to DMCH Darbhanga.

Methodology

The present study was planned in Department of Pediatrics, Darbhanga Medical College and Hospital, Laheriasarai Darbhanga, Bihar, India. The study was conducted from the March 2019 to July 2019. In the present study total 25 cases of the malnourished childrens were evaluated and discussed as below. Study was conducted with the help of pre-tested proforma. Each child was examined clinically &the important laboratory findings were noticed from the case sheet. Malnutrition was classified according to Indian academy of pediatrics (IAP) classification. This IAP classification based on weight-forage values. The standard used in this classification for reference population was the 50thcentile of Harvard standards.

A child was considered completely immunized for age if the child received all the doses as per Indian national immunization schedule. Low birth weight was defined as weight < 2.5 kg. Socio-economic state was classified according to modified 2007 kuppuswamy classification. Proper complementary feeding is taken as initiation of CF at 7months of age. Birth spacing about 24 months considered as normal. All the patients were informed consents. The aim and the objective of the present study were conveyed to them. Approval of the institutional ethical committee was taken prior to conduct of this study.

Results & Discussion

Nutrition is a fundamental pillar of human life, health and development across the entire life span. From the earliest stages of fetal development, at birth, through infancy, adolescence, and on into adulthood and old age, good nutrition is essential for survival, physical growth, mental development, performance, health and well-being. 'Malnutrition means "badly nourished" but it is more than a measure of what we eat, or fail to eat. Clinically, malnutrition is characterized by inadequate intake of protein, energy, micronutrients and by frequent infections or disease.

Table 1: Demographic Details

Parameters	No. of Cases
Malnutrition Status	
Mild	8
Moderate	7
Severe	10
Sex	
Male	12
Female	13
Locality	
Rural	19
Urban	6

Table 2: Related Details

Parameters	No. of Cases
Birth Spacing	
Proper	6
Improper	19
Socio Economic Status	
Upper	1
Middle	4
Lower	20
Exclusive breast feeding	
Yes	4
No	21
Anemia	
Yes	23
No	2
Immunization	
Complete	21
Incomplete	4

Devi *et al*. (1997) [5] in their study, revealed that the total of 452 new borns and 2210 children upto the age of 5 years were assessed through anthropometrical measurements in the urban areas of Manipur. The study revealed that 86.3% of the children had normal weight for age by Indian standard (ICMR) when compared with Harvard standard, 64.0% were having low weight for their age. On the basis of height for age, 64.7% of the children were normal by Harvard standard where as 90% were normal by Indian standard. The chest and head circumference ratio was more than one about the second year of life. Between boys and girls, malnutrition was more prevalent among girls [5].

Chhabra *et al*. (1997) [6] based their study, on a house – to – house survey, which included 366 children in the under – five age groups, in the village. Mothers were interviewed for personal characteristics. A detailed examination was done which included a general physical and systematic examination and assessment of nutritional status of children. The study revealed that out of 366 children, the majority 242, (65.9%) had a normal nutritional status 95 (26%) had mild nutrition and 30 (8%) had moderate to severe malnutrition. A statistically significant association was observed between overall incidence of ARI and the nutritional status. The incidence of ARI was 3.27, 2.87 and 2.26 episodes per child per year in the moderate to severely malnourished, mildly malnourished and children with a normal nutritional status respectively. The incidence of Upper Respiratory tract Infections (URI) was higher in the malnourished children than the children with a normal nutritional status. There was a significant association between the incidence of lower respiratory tract infections (LRI) and nutritional status and the incidence being highest (0.6 episodes per child) in the moderately to severely malnourished children and lowest in the children with a normal nutritional status (0.2 episodes) [6].

Grag, S.K. *et al*. (1997) [7] in their study, revealed that majority (58.2%) of children were having under-nutrition of varying grades irrespective of their sex and caste but influenced by their age and ICDS beneficiary status. Anemia, xerophtalmia and goitre were present in 14.7%, 1.6% and 0.6% children respectively. Average daily dietary intake of energy and nutrients were lower than the recommended daily allowances (RAD). Regular nutritional supplementation along with adequate nutrition education would reduce the nutritional deficiency disorders among children [7].

The Bulletin of WHO (2000) [8] 6 revealed that nutritional status can be assessed using clinical signs of malnutrition, biochemical indicators and anthropometry. Anthropometry has an important advantage over other nutritional indicators: whereas biochemical and clinical indicators are useful only at the extremes of malnutrition, body measurements are sensitive over the full spectrum. In addition, anthropometric measurements are non-invasive, inexpensive and relatively easy to obtain. The main disadvantage of anthropometry is its lack of specificity, as changes in body measurements are also sensitive to several other factors, including intake of essential nutrients, infection, attitude, stress and genetic background [8].

In other studies in India like the one conducted by B. Aneja P. Singh *et al* in Delhi in 2000 has given the prevalence of malnutrition among under-fives as 26% with 6% of them severely malnourished [10]. In another study conducted by A. Laxmaiah et.al in Punjab in 2001 shows that about a half of the preschool children (50.3%) were undernourished (<2SD weight for age); 60% were stunted (<2SD height for age) and 12% were wasted (<2SD weight for height) [11]. In another study conducted in Kerala by Meena Karunakaran *et al* in 1981 has put the prevalence of malnutrition in Kerala at 59.1% [12] Stunting was about 60%, underweight about 55% wasted 34.5% in a study conducted by R.J. R.J. Yadav and Padam Singh in 1999 [9]. Shally Awasthi, Rohini Das et.al conducted a study in Uttar Pradesh in 2003 the prevalence was 67.3% underweight and (87.6%) stunting [13]. Thus the prevalence of severely malnourished children in our study is also low but the proportion of children mildly malnourished is unacceptably high.

According to National Family Health Survey-3, 2005-06, 36% of women in Uttar Pradesh are thin, based on their BMI; almost half of them (14.9%) are severely or moderately thin. In the same survey, anemia was present in 49.9% of women with 14.8 % having severe to moderate degree of anemia [14]. Our data showed a much higher proportion of women having malnutrition and anemia. Association between malnutrition and multiple factors such as parents' education, number of under-five children, birth order, mother's BMI and height have been reported earlier [15, 16]. The maternal and child undernutrition study group concluded that to improve nutrition in mother and child, intervention in the dietary intake should be supplemented with other strategies like improvement in the underlying determinants of under- nutrition such as poverty, poor education, disease burden and lack of women empowerment [17].

Making India malnutrition free is possible, but it is not easy. It requires great and target-oriented efforts toward every relevant field. Besides monitoring and surveillance of ongoing programs, a comprehensive approach involving legislative, service, and educational inputs is also needed. To curtail the problem of undernutrition which has persisted since the independence of India and to tackle the emerging problem of overweight and its relative health risks as results of nutrition transition require grass-root level planning considering the rationale behind the problem instead of blanket approach. In spite of agricultural country and having enough grain availability, unfortunately, a large section of the country is in the condition of food deprivation; thus, there is a need to adopt modified strategies to ensure food and nutrition security to people living in India. This also requires organizational, financial, and managerial reforms.

Conclusion

The data generated from the present study concludes that major epidemiological risk factors are Low birth weight, Low socio-economic status, illiteracy & low educational status among mothers, Improper breast feeding & complimentary feeding practice, Anemia during pregnancy in mothers, Improper birth spacing, high birth order., living in tribal, rural & urban slum areas. & the most of malnourished children were anaemic & suffering from diarrheal illness.

References

1. https://unicef.in/Story/1124/Nutrition
2. Planning Commission. Strategies for Under Six: A framework for the 11th plan, Government of India, 2007.
3. World Bank. Repositioning Nutrition as central to

development: A strategy for large-scale action, The International Bank for Reconstruction and Development, World Bank, Washington DC, 2006.
4. Pelletier DL, Frongillo EA, Schroeder DG, Habicht JP. The effects of malnutrition on child mortality in developing countries, Bulletin of the World Health Organization. 1995; 73:443-448.
5. Devi SB, Devi RL, Singh WG. "Nutritional status of preschool children in Manipur", 'Indian Journal of Medical and Child Health'. 1997; 8(3 & 4):79-83.
6. Chhabra Garg. "Risk factors for acute respiratory infection in under – fives in a rural community", 'Indian Journal of Medical and Child Health'. 1997; 8(1):13-17.
7. Grag SK, Singh VL, Bhatnagar M, Chopra H. "Nutritional status of children (1 to 6 years) in slums of Ghaziabad city, Department of Social and preventive Medicine, LLRM Medical College, Meerut", 'Indian Journal of Community Medicine', 1997, 22.
8. Bulletin of the WHO, Genebra, 2000; 78:10.
9. Shanthi Ghosh. "Nutrition and child care: A practical guide "New delhi, Jaypee brother's medical publishers, 2004, 123-125.
10. Aneja P, Singh M, Tandon P, Pathak C, Singh U, Kapil " Etiological Factors of Malnutrition Among Infants in Two Urban Slums of Delhi" Indian Pediatrics. 2001; 38:160-165.
11. Laxmaiah K, Mallikharjuna Rao, Brahmam GNV, Sharad Kumar M, Ravindranath K, Kashinath G, *et al*. "Diet and Nutritional Status of Rural Preschool Children in Punjab" Indian Pediatrics. 2002; 39:331-338. (www.Indianpediatrics.net)
12. Meena Karunakaran, 'Nutritional status of children under five years of age in Vadakkevila Panchayath; with special reference to infant feeding and weaning practices, Thesis, Kerala University (Personal communication)
13. "Shally Awasthi, Rohini Das, Tuhina Verma, Sheila Vir Anemia and Undernutrition among Preschool Children in Uttar Pradesh" India Indian Pediatrics. 2003; 40:985-990.
14. Key indicators for Uttar Pradesh from NFHS-3. Available from: http://www.rchiips.org/NFHS/pdf/. Accessed October 11, 2014.
15. Moestue H, Huttly S. Adult education and child nutrition: The role of family and community. J Epidemiol Community Health. 2008; 62:153-9.
16. Rahman A, Chowdhury S. Determinants of chronic malnutrition among preschool children in Bangladesh. J Biosoc Sci. 2007; 39:161-73.
17. Bhutta ZA, Ahmed T, Black RE, Cousens S, Dewey K, Giugliani E, *et al*. Maternal and child survival undernutrition study group. What works? Interventions for maternal and child undernutrition and survival. Lancet. 2008; 371:417-40.