Malnutrition in children under 5 years of age in Chisapani and Sutaiya (Banke) villages

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Abstract

Malnutrition is one of the major public health problems in developing countries including Nepal. Malnutrition not only directly affects the children by reducing their physical and mental performance but also makes the situation worse by making the child susceptible to infections. The long-term effects of malnutrition also need to be highlighted. Those suffering from malnutrition in early parts of their life tend to have lower weight even during adult life. The physical work capacity is hence reduced. The present study was conducted in the rural areas of Chisapani and Sutaiya (Banke). The total sample size taken in the study was 137. The study was conducted with the help of 5 volunteer students of the college. The anthropometric measurements of children were taken. To assess the degree of malnutrition the weight/height (length) ratio was compared to the WHO/NCHS standards and stunting was also taken into account. The result puts the total of malnourished children in the study group to 63 (46.4%). On drawing comparisons, malnutrition was found to be associated with female sex, joint family and the total number of children in the family. It is thus felt that the children in these villages need special attention. This can be done by providing nutritional education to the parents and among other things by bringing on a social change so that the female child is not neglected.

Keywords: Malnutrition; children.

Introduction

Malnutrition is one of the major public health problems in developing countries including Nepal. The second report on the World Nutrition Situation by WHO shows that one third of the children below 5 years of age are underweight in the developing world (i.e. less than 2 SD of the normalized values of weight for age).1 What holds importance is not only malnutrition per se but also the increased incidence of morbidity associated with it. Diseases like diarrhoea tend to stay for longer duration (owing to the fact that the recovery of the gastric mucosa is delayed).2 The number of severe episodes of the disease is also to the degree of malnutrition.3 Thus malnutrition not only directly affects the children by reducing their physical and mental performance but also makes the situation worse by making the children susceptible to infections.

The long-term effects of malnutrition are equally worse. Those suffering from malnutrition in early parts of their life tend to have lower weight even during adult life. The physical work capacity is hence reduced. Certain studies in industrial and agricultural workers validate the same conclusion4. This holds special relevance to the rural parts of the country where the main occupation of the people is agriculture and the very livelihood of many families is dependent on this. Thus malnutrition affecting a child would affect his performance as an adult also and hence reducing not only his earnings but also casting shadow on the next generation.

The present study was conducted with the aim of collecting data on the prevalence of malnutrition among children less than 5 yrs of age living around campus of Nepalgunj Medical College in rural areas. It was also planned to do the needful for such children by educating the mothers and if needed, referral to appropriate place.

Material and Methods

The present study was conducted in Chisapani and Sutaiya (Banke) villages. The total sample size taken in the study was 137. The study was conducted with the help of 5 volunteer students of the college. To minimize bias, standard instructions were given to all the students. The data was collected on a pre structured, semi-open-ended proforma, both for the family and individual child. Clinical examination and Anthropometric measurements of the children was carried out. The data was analyzed both manually and by computer using Epi-Info software. The results were compared with the available WHO/NCHS standards which are valid for international comparisons.5,6

Results

General Demographic features

A total of 100 families was surveyed, out of which 58 were nuclear families and 42 were joint families. The number of children in each of the families was variable from 1 to 7 in case of nuclear families and up to 11 in two of the joint families. The average number of children in a nuclear families were 2.6 (an approximation of the family size) and in a joint family were 3.2

Age and Sex distribution

In the present study, the subjects were almost equally distributed in different age groups. The maximum representation being in 0-1 year age group of 34% (Table I). There was also an almost equal representation of both sexes with males being 54% and females being 46%.

Table I: Age distribution of the children

Age	*Number*	*Percentage*
0-1	34	24.8
1-2	31	22.6
2-3	28	20.4
3-4	23	16.8
4-5	21	15.3
Total	137	100

Breastfeeding

It was encouraging to find that breast feeding was a common practice among all the families surveyed. It was 100% in children less than 1 year of age and almost 90% in children up to 2 years of age. Most of the children less than 4 months of age were on exclusive breast feeding.

Immunization coverage

In more than 95% of the children the immunization was complete for the age.

Clinical history

Among the subject, nearly 60% had suffered from some or the other health problem in recent past. Significant among these were diarrhoea in nearly 25% of the children in past 1-2 weeks and history suggestive of ARI in ~ 5% of the children.

The other significant finding was that 12 (~1%) children were either under treatment or had completed treatment for Tuberculosis.

History suggestive of Vitamin A deficiency (Night Blindness) was found in 4 children.

Anthropometry

For the purpose of measuring the degree of malnutrition the height and weight of the children was measured. The weight to height (or length) ratio of the children was compared with the WHO/NCHS standards. It was found that 24.1% of the children were malnourished (Ratio<median-2 SD of the given standards). It was also found that 41.6% of the children are in the borderline region i.e. between-1SD and - 2SD of median of the prescribed standards. (Table II). One child who was just 18 days old, had a length of 45 cm. Since the comparative data available is for length of 50 cm onwards, henceforth only the remaining 136 children have been taken into consideration.

Table II: Distrbution of chidren according
to their weight to height (or length) ratio as compared to WHO/NCHS standards

Weight/Height (or Length)	*Number**	*Percentage*
>=median - 1SD	46	33.5
median-1 SD to	57	41.6
median-2 SD		
median-2 SD to	22	16.1
median-3 SD		
<median-3 SD	11	8
Total	136	99.2

* Excluding one with length of 45 cm at 18 days of life

It was also felt that perhaps the weight to height/length ratio will not take into account malnutrition in those children where stunting (reduction in height due to chronic malnutrition) has taken place. The interpretation is that there could be more number of malnourished children than those shown by this method. Keeping this in mind the height of the children was also compared with international standards.[7] The comparison showed that there were 40 children who had stunting (weight/height < 10 centile of the standards) out of which 30 had not been taken into account. Out of these 30, there were 14 children who had weight/height ratio more than median-1SD of the WHO/NCHS standards and for the rest, the ratio was between median-1SD and median-2SD. This puts the total of malnourished children in the study group to 63 (46.4%).

The mid-upper-arm circumference (MUAC) of the children was taken. It showed malnutrition in only 8% of the children (<12.5 cm). Another 38.7% were borderline (12.5 cm-13.5 cm). The results differ widely with weight/ height ratio. It has also been mentioned in literature, that MUAC measurements are likely to be inaccurate for several reasons.[6]

1. Measuring techniques are difficult to standardize.
2. Inherent measuring error is large (ą 1 cm).
3. A normal increase in MUAC of about 2 cm between 6 mth. to 5 years of age.

Hence the data has not been used any further.

The nutritional status was then compared with various parameters. On analysing the comparative data, it was found that lesser percentage of children in nuclear families were malnourished as compared to those belonging to joint families (Table III). This could be due to the fact that there were on an average greater number of children in joint families (3.2 as compared to 2.6 in nuclear families). This is also highlighted when the nutritional status is compared to the total number of children in the family. It is seen that a larger percentage of children belonging to families with 5 or more children are malnourished although the increase found is not statistically significant (Table IV).

Table III: Comparison of type of family with nutritional status

Type of family	*Malnourished*	*Normal*
Joint	33	31
Nuclear	30	42
Total	63	73

OR=1.49 0.72<OR<3.11 Cornfield 95% confidence limit for OR

Table IV: Comparison between no. of children in the family and nutritional status of the children

No. of children in the family	*Malnourished*	*Normal*
1	9	11
2	13	22
3	16	16
4	9	9
>=5	16	15
Total	63	73

chisquare =2.34 df=4 p=6.73

The most significant finding is perhaps that a large percentage of females were malnourished. The odd ratio of 1.58 for female being malnourished as compared to males is definitely very high (Table V).

Table V: Comparison of sex with nutritional status

Sex	*Malnourished*	*Normal*
Female	33	30
Male	30	43
Total	63	73

OR=1.58 0.76<OR<3.30 Cornfield 95% confidence limit for OR

Table VI: Comparison of land owned with nutritional status

*Land Owned**	*Malnourished*	*Normal*
Yes	39	41

No	24	32
Total	63	73

OR=1.27 0.60<OR<2.67 Cornfield 95% confidence limit for OR

* Indicator of socio-economic status

Since it is difficult to know the exact monthly income and other parameters to calculate the socio-economic status, the families were divided into groups - those holding land and those not holding any land. The results here were in fact contrary to the expectation. The odd ratio of family holding the land and the child being malnourished were 1.27 (table VI). Perhaps land owing did not give a true picture of the socio-economic status. It is also possible that here other factors are playing greater role in determining the nutritional status.

It was felt that since immunization coverage and the practice of breast feeding was very high, the comparison with nutritional status would not hold much relevance.

Discussion

It has been mentioned in certain literature that in Nepal, the total percentage of children with undernutrition as indicated by stunting, wasting and both of these combined is estimated to be more than 50%. The findings in this study are quite close to the figure.

Hence we find that despite high levels of immunization coverage and breastfeeding practices, 46.4% of children have been found to be malnourished. It is known that the most important factor that influences the growth is probably the caloric content of food and quality of nutritional intake.[9] Genetic factors play a role but many presumed ethnic differences in growth rate have shown to disappear when nutritional and socio-economic status improved. This has been proven in studies on Japanese migrants to USA.[10]

Other factors that have shown to affect the growth rate are the psychological well-being, birthweight, the number of siblings and the maternal age. These are also a reflection of the parental socio-economic and educational status9. But what should not be ignored here is the role of social bias against the females in general and female child in particular. (The ways in which malnutrition perpetuates is described in fig. 1)

So to sum up what is needed is

1. Health education including nutritional education for the parents,

2. Proper management of diseases.

3. Most important is a concerted action by the society to raise the social status of females.

Most of the population in these villages has agriculture as occupation and there lies the paradox the one producing food doesn't have enough for himself and even among these the one to get least is the one who makes it worth eating.

Acknowledgment

A special mention needs to be made of all the students who participated in the project with great enthusiasm. Their names are - Mr. Dipen Kadaria, Mr. Pratap Karki, Mr. Ratna Joshi, Mr. Raj Kumar KC, Mr. Surendra Gauchan.

The authors also thank Prof S N Pandeya (Principal), Prof R S Khare (HOD, Community Medicine) for their valuable guidance.

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