INTERRELATIONSHIP BETWEEN FOOD INTAKE & NUTRITIONAL ANAEMIA AMONG THE CHILDREN STUDIED IN A TERTIARY CARE HOSPITAL IN DHAKA CITY

HOSSAIN D1, MOWLAH G2, RAZZAK M3

Abstract:
This study was carried out on 128 children of which 80 were male & 48 were female admitted in Paediatric department of DMCH. They were 1 to 12 yrs. 31, 27, 24 and 46 children were of 1-3 yrs, 4-6 yrs, 7-9 yrs & 10-12 yrs age group respectively. A cross sectional sample survey study was carried out. Main variables were age, family size, monthly family income, parents education & occupation Hb and PCV levels. 58% children were illiterate group which also includes less than 5 yrs children. 12% were at primary level & 30% were at high school level. The children of 1-3yrs, 4-6yrs, 7-9yrs & 10-12yrs age groups took an average of 290, 285, 505 & 555 gm foods/child/day. Cereals intake was highest (67.7%) in comparison to other foods. Consumption of meat, fruits, fats & milk was very low. Iron intake was found more than requirement & Vit-C intake was found lowest of the nutrients requirement.

The study revealed the children met protein, iron, folic acid, Vit-A, Vit-B12, Vit-C, Vit-B6, Zinc & Copper 70.79%, 122.2%, 92%, 72%, 68.5%, 55%, 83%, 57%, 89% & 82% respectively of the requirements. Less than 50% of the requirements of iron, protein, Vit-A, Vit-C, Vit-B12 & folic acid is met by 15%, 50.5%, 39%, 45%, 12% & 29% children respectively.

Mean Hb level is found (10.39±2.23)gm/dl of blood & ranges from 4.7gm/dl to 12.9gm/dl & mean PCV level is found (30.1±2.21) percent & ranges from 13.63% to 37.41%. According to Nutrition Survey of Rural Bangladesh 1981-82 & WHO, 1972 28,29 Hb level<11gm/dl for <6yrs and <12gm/dl for 6-12 yrs age group are considered to be anaemic. In the present study I found 20(15.62%) children were severely anaemic, 32(25.26%) children were moderately anaemic & 17 (13.02%) children were mildly anaemic by this criterion.

Peripheral blood film showed 5.47% & 26.57% children with normocytic & microcytic hypocromic anaemic respectively & 14.85% children with malignancy of blood(ALL). Haemolytic anaemia with raised serum bilirubin level was found in 6.25% children. Eosinophilia was found in 18% children. Aplastic anaemia was found in 5.47% children. Aplastic anaemia & malignancy of blood were confirmed by bone marrow examination.

Introduction:
Anaemia affecting more than a billion people in the world. Nutritional anaemia is defined as a condition in which the Hb content of blood is less due to deficiency of one or more essential nutrients regardless of the cause of such deficiency1. In public health terms iron deficiency anaemia is now considered to be the most common cause of anaemia, estimated to occur in 46-50% of the children in less developed countries and 7-12% in more developed countries3. Bangladesh has a young population of 1-12 years of age of about 10%, of which 17% of 1-4 years of age (19) According to
Nutrition Survey carried out during the year of 1962—'63, 1975- '76& 1981-'82 Iron intake has shown an overall rising trend which was 10.3 mg, 22.2 mg & 23.4 mg respectively and 27.5 mg in the present study.

Methodology:
This is a cross sectional sample survey study. Food intakes was assessed by 24 hours recall method. Usual pattern of food intake was examined by 7 days food frequency method. Food values were calculated according to food conversion table. Recorded cooked foods were converted to their raw equivalents & the nutrients of these foods were calculated by using local food composition table. Paired t-test was done and multiple regression analysis was done by using SPSS/PC.

Results and Discussion: According to clinical features 43.48%, 12.08%, 8.70%, 8.21%, 4.83%, 4.35%, 3.86%, 2.41%, 1.93%, 1.45% & 8.70% children were found anaemic due to iron, folic acid, malignancy, Vit-C, Zinc, Vit-A, Vit-B₁₂, Copper, Vit-B₆, Vit-B₂, & worm infestation respectively. It was found that 14.84%, 10.94%, 12.5% & 15.63% were anaemic of the 1-3, 4-6, 7-9 & 10-12 yrs age group respectively. Hb level was found lower than acceptable to be normal level in 54% children of which 15.62%, 25.26% & 13.02% were severely, moderately & mildly anaemic respectively.

According to nutrient containing drug supplements it was found that 23.44%, 6.51%, 2.08%, 2.34%, 4.42%, .78%, 1.04%, 3.60%, 1.30% & 4.69% children were taking iron, folic acid, Vit-B₁₂, Vit-A, Vit-C, Vit-B₂, Vit-B₆, Zinc & Copper containing drugs adequately & anthelmintic drugs respectively.

The children of 1-3yrs, 4-6yrs, 7-9yrs & 10-12yrs age groups took an average of 290, 285, 505 & 555 gm foods/child/day. Cereals intake was highest (67.7%) in comparison to other foods.

Consumption of meat, fruits, fats & milk was very low. Iron intake was found more than requirement & Vit-C intake was found lowest of the nutrients requirement.

During the 7 days study period, the pattern of food intake did not differ in terms of food contents or frequency of intake. The food was poor & monotonous. Most of the respondents (67%) of the children brought food from suitable places. 15-30% of the patients were totally dependents on hospital diets.

Children of 1-1.5yrs and 1.5-2 yrs 82.1% & 63.7% were breast-fed respectively. Breast feeding often continued to the age of 3 yrs & occasionally beyond this. Milk supplementation was found in 93.1% and 95.1% among 1-1.5 & 1.5-2 yrs age group respectively. Supplementary foods were taken by 87.5% and 98.1% children of 1-1.5 & 1.5-2 yrs age group respectively.

The study revealed the children met protein, iron, folic acid, Vit-A, Vit-B₁₂, Vit-C, Vit-B₂, Vit-B₆, Zinc & Copper 70.79%, 122.2%, 92%, 72%, 68.5%, 55%, 83%, 57%, 89% & 82% respectively of the requirements. Less than 50% of the requirements of iron, protein, Vit-A, Vit-C, Vit-B₂ & folic acid is met by 15%, 50.5%, 39%, 45%, 12% & 29% children respectively.

In the present study a small fraction of the children took Vit-A capsules and anthelmintic drugs during the government’s distribution program. Those who took their levels of Hb & PCV were higher. Food scoring data revealed that 35.16%, 56.25%, 27.86%, 6.51%, 14.32%, 23.96%, 14.84%, 41.14% & 39.32% used to take iron, folic acid, Vit-B₁₂, Vit-A, Vit-C, Vit-B₂, Vit-B₆, Zinc & Copper containing foods regularly & others mostly met less than 3 times a week.

Food scoring data showed that 43.21% children got weaning foods twice daily & 38% of the other children got normal diet twice weekly in adequate amount which was found highest.

Conclusion:
Illiteracy & ignorance about food preparation have been found to have effect on the development of anaemia & its consequences.

Recommendation:
To control high prevalence of anaemia improved counselling in nutrition, fortification of food with iron & folic acid, multivitamin supplementation, anthelmintic supply to the children are needed under consideration in planned national anaemia survey.
**Fig.-1:** Contribution of different food groups to protein, iron, Vit-A, Vit-C, Riboflavin & Zinc.

**Fig.-2:** Comparison of percent intake of nutrients by the children by sex. Foot Note: Fig.-2 shows percent intake of different nutrients by the male and female children. In indicates intake of Vit. $\text{B}_{12}$, Vit-A, Bit $\text{B}_{2}$, and copper is comparatively higher by the female children. On the other hand, protein, iron, Folic acid, Vit C, Vit $\text{B}_{6}$, Zinc intakes are higher by the male children. It also indicates that iron intake is more than the requirement.
Table-III
**Nutrient Intake Per Child Per Day By Sources (Per 100 gm)**

<table>
<thead>
<tr>
<th>Nutrients</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cereals</td>
</tr>
<tr>
<td>Protein (gm)</td>
<td>56.91</td>
</tr>
<tr>
<td>Iron (gm)</td>
<td>3.08</td>
</tr>
<tr>
<td>Folic</td>
<td>12.0</td>
</tr>
<tr>
<td>Vit. B12 (ug)</td>
<td>0</td>
</tr>
<tr>
<td>Vit. A (ug)</td>
<td>4.37</td>
</tr>
<tr>
<td>Vit. C (mg)</td>
<td>0</td>
</tr>
<tr>
<td>Vit. B2(mg)</td>
<td>.92</td>
</tr>
<tr>
<td>Vit.B6(mg)</td>
<td>.10</td>
</tr>
<tr>
<td>Zinc (mg)</td>
<td>0</td>
</tr>
<tr>
<td>Copper(mg)</td>
<td>.33</td>
</tr>
</tbody>
</table>

Table- II
**Per Capita Food Intake Per day (mean ±sd) by The children**

<table>
<thead>
<tr>
<th>Food Item</th>
<th>Gm/child/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cereals</td>
<td>328.95±175.94</td>
</tr>
<tr>
<td>Roots</td>
<td>10±5</td>
</tr>
<tr>
<td>Sugars</td>
<td>.50±.20</td>
</tr>
<tr>
<td>Pulses</td>
<td>10±3</td>
</tr>
<tr>
<td>Leafy Vegetables</td>
<td>25±20</td>
</tr>
<tr>
<td>Non-leafy vegetables</td>
<td>50±45</td>
</tr>
<tr>
<td>Fruits</td>
<td>2.5±4.2</td>
</tr>
<tr>
<td>Meat</td>
<td>2.5±1.5</td>
</tr>
<tr>
<td>Egg</td>
<td>107.5</td>
</tr>
<tr>
<td>Fish</td>
<td>5.15±4.2</td>
</tr>
<tr>
<td>Milk</td>
<td>22±20</td>
</tr>
<tr>
<td>Fats and oils</td>
<td>2.5±1.0</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>9±2</td>
</tr>
<tr>
<td>Total</td>
<td>485.6 gm/child/day</td>
</tr>
</tbody>
</table>

Foot Note:- Table-IV shows daily average food intake by the children. Mean intake is 485.6 gm/child/day. The contribution from cereals is 328.95 -gm (67.7% of the total food intake) per day. Food intake from animal sources is only 23.65gm (4.9%) of total food intake. Protein also comes from cereals. Total protein intake is 13.7% of total food intake. Pulse intake is about 10 gm/child/day. The intake of cereal is more than the recommended value compared to the animal foods. The consumption of fruits, fats and (after weaning period) milk is very low.

References
37. CNU cut off points.


