



Glimpse

international centre for
diarrhoeal disease research, bangladesh
NEWSLETTER

Volume 11 Number 6

ISSN 0253 - 7508

November - December 1989

Identification of Potentially Malnourished Children

More than half of the deaths of young children in Bangladesh are associated with poor nutritional status. Diarrhoea and other diseases substantially increase the risk of dying in these nutritionally vulnerable children. Prevention of malnutrition is, therefore, a priority in any child survival programmes.

To combat the problem of malnutrition, there should be an effective way to identify children who are likely to become malnourished, and ideally such children should be identified before they become severely malnourished. Too often interventions are directed at children who are already malnourished, missing the opportunity to treat children when the most severe nutritional deficit is actually occurring, but the effects are not yet visible.

Growth monitoring is increasingly being used to detect children at risk of malnutrition. Although growth charts were developed to record the health of individual children they are also recommended as a tool to identify potentially malnourished children who need nutritional help. The underlying assumption is that children who experience poor weight gain are at risk of becoming malnourished. This is an appealing concept and has been applied by several major international organisations to target nutritional interventions.

A recent study tested whether regular monitoring of weight is an efficient way to detect children at risk of becoming malnourished (Henry FJ, Briend A, Cooper E. Targeting nutritional interventions: is there a role for growth monitoring? *Health Policy Plann* 1989 Dec;4(4):295-300). The study examined the relationship between weight changes and the subsequent weight of children in an attempt to determine whether there might not be a more practical and effective indicator of future malnutrition than monthly weighing.

Two cohorts of children in Bangladesh and the Caribbean were studied prospectively for 18 months. The results showed that, after one year of age, body weight was more closely correlated with weight at six months of age than with weight changes during the previous 3 months. Moreover, body weight at six months was more closely correlated with later weight than with birth weight. These findings indicate that providing nutritional support by supplementary food to 6-month-old children, who are in the lower portion of the weight distribution, might be more effective than using monthly growth monitoring or by identifying low-birth weight children. In a primary health care facility, this approach may give an earlier and more precise warning of nutritional deficiencies in infants than monitoring their monthly weight changes later in life. The advantage of single against repeated monthly measurements is also obvious. The children monitored at around 6 months of age may not necessarily be malnourished at the time, but they are likely to be the children who will be at the highest risk later.

Another purpose of growth monitoring is to reinforce the feeding and hygienic practices of mothers who have children growing well. In the two cohorts of children studied in Bangladesh and the Caribbean, the data show that children who have a high weight-for-age in early life are also likely to be better nourished later.

The benefits and limitations of growth monitoring have been discussed before, but most attention has been paid to the operational issues involved. In this paper, the authors question the importance of growth monitoring as a tool to identify children at the highest risk of malnutrition, and suggest that it is significantly and substantially weaker than measuring weight at 6 months. Another recent study (see *Glimpse*, vol. 11, no. 4, 1989) questioned the relevance of growth monitoring to detect children with a high risk of death. The results show that the measurement of their body weight at sixth month can better identify

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ICDDR,B Board Meeting Held

The twenty-first meeting of the Board of Trustees of the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) was held in Dhaka from December 14 to 16, 1989. The Chairman of the Board, Dr Peter Sumbung presided over the meeting.

The Trustees considered and approved the reports of the Board's Programme, Personnel and Selection, and Finance Committees. The meeting commended the Director and his staff for preparing the Centre's five-year Strategic Plan which details the priorities and programmes of ICDDR,B for the 1990-1994 period and approved its implementation.

The Strategic Plan is the result of substantial efforts on the part of the Centre's management and will serve as a working guide and integrating mechanism to the staff, as a terms of reference and framework upon which to build for the Trustees, and as an illuminating introduction to potential donors and a

clear statement of goals, paths and progress to current donors.

The Board also approved the Centre's budget for 1990. The current estimates indicate that there will be a shortfall in income of approximately US \$ 1.2 million which must be raised to meet the 1990 expenditure.

The meeting of the ICDDR,B Board was followed by the meeting of the ICDDR,B Donors Support Group on 17 December 1989. The donors expressed their satisfaction with the positive changes and directions taken by the Centre and with the Strategic Plan that was presented to them. The donors discussed ways in which they could assist the Centre to achieve a more sustainable and financially secure base.

It may be mentioned here that the Centre is governed by a Board of Trustees consisting of 17 members, including 3 from Bangladesh. The present members are from Australia, Bangladesh, Canada, Ethiopia, India, Indonesia, Jamaica, Japan, Saudi Arabia, Sweden, U.K., U.S.A., UNICEF and the World Health Organization. Three new members from Australia, Canada, and Saudi Arabia joined the Board in the current meeting.



The members of the ICDDR,B Board of Trustees are seated around the table.

ABSTRACTS of ICDDR,B Publications

Phillips JF, Simmons R, Koenig MA, Chakraborty J. Determinants of reproductive change in a traditional society: evidence from Matlab, Bangladesh. *Stud Fam Plann* 1988 Nov-Dec;19(6):313-34.

"A decade has elapsed since a project was launched in Matlab, Bangladesh to test the hypothesis that contraceptive services can induce and sustain fertility decline in a rural traditional population. The demographic impact of this project has been pronounced, lending support to the view that supply-side policies can succeed even where institutional supports for demand are weak. This paper reviews the relationship between the Bangladesh climate of demand and the Matlab system of supply with the aim of explaining how such effects arise. A sociologically appropriate system of supply can induce fertility change in a society where such change would not spontaneously arise. The study of programs and the "sociology of the supply side" thus deserve the same degree of rigor accorded to research on the "sociology of demand."

Nessa F, Rahman S. The effect of nutrition and breast feeding on fertility. *Bangladesh J Nutr* 1988 Dec;2(1):26-30.

"Undernutrition/malnutrition plays a very important role in reduction of fecundity and fertility and acts as natural contraception. The major effect is seen in delayed puberty and secondary amenorrhoea. Under-fed women has more abortion, foetal wastage and immature births leading to high neonatal mortality. Desire for replacement of child leads to frequent pregnancy and more malnutrition leading to more foetal wastage and maternal death which affects fertility pattern. Breast-feeding has a considerable impact on fertility in general and birth intervals in particular. Lactation achieves its birth spacing effect by delaying the resumption of ovulation."

Islam MS, Drasar BS, Bradley DJ. Attachment of toxigenic *Vibrio cholerae* 01 to various freshwater plants and survival with a filamentous green alga, *Rhizoclonium fontanum*. *J Trop Med Hyg* 1989 Dec;92(6):396-401.

"In Bangladesh, cholera epidemics occur twice a year. *V. cholerae* 01 are readily isolated from the environment only during epidemics. The interepidemic reservoirs or sites of survival and multiplication of *V. cholerae* are still unknown. Investigations were carried out with various fresh-water plants as possible reservoirs of *V. cholerae* in the environment. Attachment to and acute population changes of *V. cholerae* on various plant surfaces was used as a screening technique to screen a particular plant species for survival studies. Five plant species, *Anabaena variabilis*,

Rhizoclonium fontanum, *Cladophora* sp., *Fontinalis antipyretica* and *Elodea canadensis* were used for attachment experiments. Among these plants, *R. fontanum* showed the best attachment. On the basis of attachment results, survival experiments were carried out with *R. fontanum*. At 0.05% salinity toxigenic *V. cholerae* 01 survive longer in the presence of *R. fontanum* than in medium without algae."

Sayeed S, Sack DA, Qadri F. Cross-reacting antigens between *Plesiomonas shigelloides* 0:17 and *Shigella sonnei*. *Bangladesh J Microbiol* 1989 Dec;6(2):7-12.

"*Plesiomonas shigelloides*, a member of the family *Vibrionaceae*, has been reported sporadically as a possible diarrhoeal agent from different parts of the world. However, the actual mechanism of pathogenesis is unknown. Only one serovar (0:17) shares a common O-antigen with that of *Shigella sonnei* phase I variants and can agglutinate with anti-O *S. sonnei* serum. In this study, hyperimmune antiserum was raised in rabbits against whole cell-lysates of *S. sonnei*. In crossed-immunoelectrophoresis, multiple bands were detected against *P. shigelloides* SVC 01 antigens. The major cross-reacting antigen was a dark band near the sample well, typical of lipopolysaccharides. On heating, the mobility of the antigen increased although the antigenicity remained intact. Purified lipopolysaccharide obtained from *P. shigelloides* SVC 01 showed a similar pattern on crossed-immunoelectrophoresis indicating that the lipopolysaccharide is the only heat-stable cross-reacting antigen between the two species."

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Forthcoming International Meetings and Conferences

INTERNATIONAL SYMPOSIUM ON AEROMONAS AND PLESIOMONAS, Helsingor, Denmark, September 5-6, 1990. Dr A Ljungh or Dr T Wadstrom, Lund University, Department of Medical Microbiology, Solvegatan 23, S-223 62 Lund, Sweden.

33RD SEAMEO-TROPED REGIONAL SEMINAR ON EMERGING PROBLEMS IN FOOD-BORNE PARASITIC ZOOZONOSIS: IMPACT ON AGRICULTURE AND PUBLIC HEALTH, Chiang Mai, Thailand, November 14-17, 1990. For further information contact: Prof Chamlong Harinasuta, Coordinator, SEAMEO-TROPED Project, 420/6 Rajbithi Road, Bangkok 10 400, Thailand.

Malnourished children

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children at most risk of death than monitoring the changes in their weight over time.

These findings suggest that, for a primary health care intervention, choosing children who are in the lower portion of the weight distribution at 6 months of age could be a better and more economical way to identify children at the highest risk of malnutrition. The proportion of children to be selected to get additional nutrition will depend on the type of intervention to be implemented and the resources available. •

ABSTRACTS of ICDDR,B Publications

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Rahim Z, Suthienkul O, Aziz KMS, Echeverria P. *Aeromonas* and other indicator bacteria in aquatic sources in Thailand. *Bangladesh J Bot* 1989 Dec; 18(2):197-204.

"*Aeromonas* sp., faecal coliforms (FC), and *Klebsiella* sp. were counted in water samples collected from one lake, three ponds, and six points of the Chao Phraya river passing through three important places of Thailand: Bangkok city, Nonburi and Samutprakan province. Counts of *Aeromonas* sp., FC and *Klebsiella* sp., ranged from 1.5×10^3 to 2.6×10^4 , 1.3×10^2 to 1.1×10^4 and 1.7×10^3 to 1.5×10^4 per 100 ml of water respectively. Highest *Aeromonas* sp. and FC counts were recorded in the water samples collected from the Chao Phraya river at the Samutprakan province and from a pond at the National Zoo respectively. Variation of electrical conductivity, pH and salinity was noted in the waters of different sampling sites. The highest salinity 10.3 parts per thousand, pH (7.6) and electrical conductivity (1.4×10^4 micro ohm/cm) were recorded in the brackish water of the Chao Phraya river in Samutprakan province."

Butler T, Arnold M, Islam M. Depletion of hepatic glycogen in the hypoglycaemia of fatal childhood diarrhoeal illnesses. *Trans R Soc Trop Med Hyg* 1989 Nov-Dec; 83(6):839-43.

"To determine whether depletion of liver glycogen

or accumulation of liver fat (steatosis) was associated with the development of hypoglycaemia in children with fatal diarrhoeal illnesses, a case-control study was carried out comparing 17 children who had blood sugars < 30 mg/dl with 17 age matched control children who had blood sugars > 59 mg/dl. The most common causes of diarrhoea in the hypoglycaemic children were *Shigella* sp. and *Vibrio cholerae*. The mean duration of diarrhoea before admission for the hypoglycaemic children, 7.8 d, was shorter than the 20.7 d for the controls ($P < 0.01$). Most children in both groups showed signs of malnutrition, metabolic acidosis, and pneumonia. Liver specimens were obtained at post-mortem examination and stained with haematoxylin and eosin for general assessment and with periodic acid-Schiff stain for glycogen. Glycogen depletion was detected in 9 hypoglycaemic children and in only 3 control children ($P < 0.05$). Hepatic steatosis, on the other hand, occurred with equal frequency in both groups but was associated with severe malnutrition in the hypoglycaemic patients ($P < 0.05$). This result suggested that hypoglycaemia develops during acute diarrhoeal illnesses because gluconeogenesis fails to maintain the blood sugar concentration after depletion of liver glycogen. Frequent feeding of children with diarrhoea might help to prevent this complication." •

Journal of Diarrhoeal Diseases Research (JDDR)



JDDR is a quarterly journal on diarrhoeal disease-related subjects.

Subscription rates for 1990

SAARC region - US\$ 35
(Except Bangladesh)
Bangladesh - Tk. 200
All other countries - US\$ 45

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Cover design: Asem Ansari

Published by International Centre for Diarrhoeal Disease Research, Bangladesh, GPO Box 128, Dhaka 1000, Bangladesh.
Telephone: 600171 (8 lines); Cable: CHOLERA DHAKA; Telex: 675612 ICDD BJ; Fax: 880-2-883116

Printed by Minerva Offset Printing Press Ltd., 157 Shantinagar, Dhaka 1217