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# Nutritional Problems of Children

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## *1. Introduction*

It is very sad to realize that a world food and nutrition crisis, in which millions are actually dying of hunger, was necessary to shake the conscience of the international community and political leaders about the problem of malnutrition. In fact, we believe that the increasing prevalence of acute hunger which we are seeing today is only an exacerbation and the more visible and dramatic manifestation of the much greater problem of hidden and chronic hunger which has affected the majority of the world's population for centuries.

Acute hunger is intolerable in these days of advanced and sophisticated technology and I hope that the world community will shortly find ways of solving the problem. My main concern is, however, with chronic, sub-clinical malnutrition, and it is on this subject and its effect on children that I would like to speak today. I will not deal with the syndromes of marasmus and kwashiorkor, which are only the final stages although frequently the only recognized ones of malnutrition in children. Their existence in a given population should be seem primarily as an indication of the presence, in much greater proportions, of chronic malnutrition which, as I will try to illustrate, has very serious social and economic implications. The relatively few children who unfortunately reach the point of developing kwashiorkor or marasmus should be treated, but the problem which their presence indicates should not be neglected. How does chronic malnutrition manifest itself and what are its consequences?

## *2. Birth weight*

It has been recognized for a long time that the average birth weight of babies in populations of underdeveloped areas is lower than in Europe or the United States, although the difference may not be great. However, there are two points which should be further analyzed in this respect. The first is that the information on birth weights in underdeveloped areas, usually taken from hospital records, refers to a selected group of the population – those who go to hospital for delivery – and is frequently not representative of the population as a whole. The second and more important consideration is that the average

figure has relatively little value: what is important is the proportion of underweight babies.

In studies carried out by INCAP in Guatemala in which it was possible to obtain the birth weight of all babies born alive in an Indian rural community over a period of seven years [1], it was found that about 40% had a birth weight below 2,500 g: only 9% were premature by gestational age and about 32% were "small for date" or babies born at term but with a very low birth weight. Now what is the significance of this phenomenon? It has been said that it could be a genetic characteristic – the studies were carried out in a population of almost pure Indians of Mayan descent – but we have indications that a similar situation occurs in white populations of Spanish origin but living in similar poor environmental conditions and with an inadequate diet. Furthermore, other INCAP studies have shown that food supplementation of the mother's diet during pregnancy results in an increased birth weight [2]. We must therefore conclude that we are really dealing with intrauterine malnutrition. But what could be the importance of this high frequency of low birth weight? We have evidence indicating that these low birth weight babies are less likely to survive, particularly in the poor environment in which they have to live. They are the main contributors to the very high infant mortality rates observed in these populations. The mortality of the low birth weight babies is very high, not only during the neo-natal period as has been demonstrated even in developed countries, but during the post neo-natal period as well [1]. The practical implication of these observations is that it seems that the single measure which would have the greatest impact in reducing infant mortality in populations like the ones studied would be to improve the nutritional condition of the mothers.

### *3. Growth and development*

Life is very difficult for those children who manage to survive. Their physical growth is impaired. Starting from about six months, when breast milk, on which all these children are fed, becomes insufficient as the main source of energy and nutrients, their rate of growth diminishes considerably in relation to the standard. Again, we have evidence indicating that this is not a genetic phenomenon but the result of environmental factors, primarily poor nutrition and a high rate of infectious diseases acting simultaneously and synergistically.

These children will grow to be very small for their age and will become small adults. We strongly believe that bigger is not necessarily better, when the variation in size is within the normal genetic variation in a given population; but what is the significance of whole populations stunted by environmental factors? Many recent studies have shown that these children, retarded in growth because of malnutrition, also have a retardation in mental and psychological development and a reduced learning capacity [3]. I do not consider that it has yet been clearly demonstrated that this mental retardation is directly related to

the nutritional deficiencies these children suffer, or whether the cause is the deprivation of social and psychological stimuli which goes together with malnutrition in their lives. Studies at present being conducted by INCAP suggest that both types of deprivation affect their mental performance in different and complementary ways. In any case, the question is more of academic than of practical importance because the fact is that, irrespective of the cause, their learning capacity is reduced at the time when it is most intense and most important. The question then arises as to whether this reduces their capabilities as adults with subsequent effect on their chances for success in life. Since, even if their mental capacity recovers later, they have been handicapped during the learning period. In rapidly developing countries there is a growing demand for greater knowledge and mental capability. Their opportunities for becoming more useful citizens and rising above the poor conditions into which they were born may therefore be reduced. They will become the parents of similar children and the inequalities in society will continue. This is not only morally unacceptable but it also interfers with real progress and socio-economic development.

*4. Effects of transculturization*

So far I have described the situation of traditional populations in which prolonged breast feeding, usually for more than a year, is the only known way of raising babies. This has enabled these populations to survive under the very unfavourable conditions in which they live. But unfortunately, during the last decades, the effects of urbanization, industrialization and the influence of the occidental culture is changing the pattern. Babies are being weaned and bottle fed from a very early age. Without entering into a discussion on the relative value of breast feeding against artificial feeding, it is all too evident that bottle feeding is not a safe and convenient practice in population groups with low sanitary standards, low economic capacity and low educational levels. The result is that the synergistic effect of malnutrition and infection starts earlier in life and with more dangerous results. In spite of the efforts made to provide more and better medical services, infant mortality is not reduced and may even increase. Artificial feeding under these circumstances and the resulting higher frequency of disease and malnutrition in early infance deteriorates still further the economy of the family and the community and the risk of damage to the surviving population becomes greater. In this way what we call "civilization" is further disturbing the already very weak ecological equilibrium in which these populations have managed to survive.

*5. Conclusions*

The lessons to be learned from these observations can be summarized as follows:

1. More attention should be given in nutritional programmes to improving the nutritional condition of mothers. In the past most of the intervention programmes in nutrition, mainly supplementary feeding programmes, were concentrated on school children, primarily because it is a captive population easily reached. With the realization that at that age most of the damage resulting from malnutrition was already done, attention focussed on the preschool child – and even more recently in communities where early weaning has become a common practice – on the infant. However, in our view the intrauterine period of life has not yet received enough attention. We should remember that when a baby is born he is already about nine months old and that these nine months are the period of greatest growth and development.

2. Efforts should be made to prevent early weaning, particularly in population groups which are not ready for the complicated and at least questionable practice of artificial feeding. Once the trend has changed it is much more difficult to reverse it. Improved nutrition of the mothers, in addition to reducing low birth weights of their babies, will also improve their lactation performance. Thus, if nutritional supplements have to be provided to these population groups, the pregnant and lactating mothers should have preference over the infants. Providing food supplements to infants will further encourage early weaning.

3. In late infancy and early childhood, efforts should be oriented towards making local foods such as cereals and legumes more easily available and stimulating the adequate use of them for small children. If properly prepared and combined, these foods can satisfy the nutritional requirements of young children. It should be remembered that milk is not really indispensable for this purpose, nor are other animal foods. Although these foods are very convenient if available within the reach of the populations concerned and are accepted as part of their food habits, adequate diets could be designed, even for small children, on the basis of cereals and legumes in accordance with local availability and customs. What may be required, in addition to ensuring the availability of these foods, is the introduction of simple technology for making possible an adequate diet for young children based on them. For instance in Guatemala, although corn and beans are the staple foods, small children are not given beans but only the water in which they are cooked as the whole beans are not easily digested by children not able to masticate properly. If mashed beans, but even better strained to eliminate the husks, were given in sufficient amounts, they could supplement the predominantly corn diet responsible for the present poor nutrition. It is by simple measures like this and not by attempting a complete change of diet to the norms accepted in an occidental culture, that there is hope of correcting the problem of feeding small children in the technically underdeveloped areas of the world without creating more problems than already exist and without waiting for an overall improvement in the socio-economic standard of living. Although this should be the ultimate goal it is a long-term propo-

sition and the vicious circle of poverty, ignorance, malnutrition and disease, if not broken, will tend to maintain the present unacceptable situation. In the long-term, malnutrition should be seen only as the symptom of a disease in society. It cannot be controlled by specific measures oriented towards correcting the symptom: this is palliative medicine, but some measures like the ones suggested could be of great help as part of an overall effort to eliminate the disease from its roots.

**Summary**

In the underdeveloped areas of the world malnutrition frequently starts "in utero" as indicated by a high proportion of low birth weight babies. These "small for date" babies have a high risk of death and contribute significantly to the high infant mortality rates observed in these populations. After birth inadequate physical growth is the most frequent manifestation of malnutrition. It is not yet clear if the observed mental retardation is directly related to malnutrition or more to psycho-social deprivation, but it is anyhow an important problem. The effects of transculturization resulting in early weaning is complicating the situation even more by producing severe malnutrition at earlier ages.

**Zusammenfassung**

In den unterentwickelten Ländern der Erde beginnt die Fehlernährung häufig schon «in utero», wie der hohe Prozentsatz an Neugeborenen mit niedrigem Geburtsgewicht zu zeigen scheint. Die Letalität dieser relativ unterentwikkelten Neugeborenen ist hoch und trägt in signifikanter Weise dazu bei, die kindliche Mortalität in den unterentwickelten Bevölkerungsgruppen zu erhöhen. Die häufigste Erscheinung der Fehlernährung nach der Geburt ist das mangelnde Körperwachstum. Es ist noch nicht sicher, ob der beobachtete geistige Rückstand in direktem Zusammenhang mit der Mangelernährung steht, oder ob er vielmehr auf psychische und soziale Mängel zurückzuführen ist; dies bleibt auf jeden Fall ein wichtiges Problem. Die Folgen der kulturellen Veränderungen, in Zusammenhang mit vorzeitigem Abstillen, komplizieren zusätzlich die Situation, indem sie zu schwerer Fehlernährung im frühen Kindesalter beitragen können.

**Résumé**

Dans les régions de la terre en voie de développement, le syndrome de malnutrition commence souvent déjà «in utero», comme l'indique la haute proportion de nouveaux-nés souffrant d'un retard pondéral. Le risque létal de ces nouveaux-nés, relativement mal développés par rapport à leur âge, est haut et contribue de façon significative à l'élévation du taux de mortalité infantile

observé dans les populations de telles régions. La manifestation la plus fréquente de la dystrophie alimentaire après la naissance est la croissance physique inadéquate. Il n'est pas encore clair si le retard mental qu'on a pu observer est en relation directe avec la malnutrition ou bien s'il est plutôt dû à des privations sur le plan psychique et social; il reste toutefois un problème important. Les effets de modifications culturelles résultant de la cessation précoce de l'allaitement maternel compliquent encore plus la situation, puisqu'elle peut causer une dystrophie alimentaire sévère dès l'âge précoce.

**Riassunto**

Nelle regioni della terra in via di sviluppo, la sindrome di malnutrizione ha frequentemente inizio già «in utero», come lo indica l'alta proporzione di neonati di basso peso. Il rischio letale di questi neonati, relativamente sottosviluppati per la loro età, è alto e contribuisce in modo significativo ad elevare il tasso di mortalità infantile osservato nelle popolazioni di tali regioni. La manifestazione più frequente della distrofia alimentare dopo la nascita è la crescita fisica inadeguata. Non è ancora chiaro se il ritardo mentale che si è potuto osservare sia direttamente in relazione con la distrofia alimentare, oppure se esso sia piuttosto dovuto a carenze sul piano psichico e sociale; ciò è tuttavia un problema importante. L'effetto di modificazioni culturali risultanti dalla cessazione precoce dell'allattamento materno rende ancora più complessa la situazione, dato che ciò può provocare sindromi severe di carenza alimentare nell'età precoce.

1 Mata L. J. et al.: Antenatal events and postnatal growth of children. Western Hemisphere Nutrition Congress IV, Bal Harbour, Florida, August 1974.

2 Habicht J. P. et al.: Relation of maternal supplementary feeding during pregnancy to birthweight and other sociobiological factors. In: Nutrition and Fetal Development. Myron Winick (ed.), p. 127–145. John Wiley & Sons, New York 1974.

3 Cravioto J., Hambroeus L. and Vahlquist B. (ed.): Early Malnutrition and Mental Development. Almquist and Wiksell, Stockholm 1974.

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