WEANING PERIOD WITH SPECIAL REFERENCE
TO WEANING FOODS

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WEANING - A GENERAL REVIEW

by

Dr J. Paget Stanfield

The intention of this paper is to provide a review of the subject of weaning as seen from the viewpoint of the paediatrician working in a developing country.

The subject will be presented under the following headings :

1. DEFINITION
2. COMPONENTS OF WEANING
3. PATTERNS OF WEANING
4. FACTORS INFLUENCING WEANING
5. DANGERS OF WEANING
6. PRACTICAL PROTECTIVE PREVENTIVE MEASURES

1. DEFINITION OF WEANING

Clear understanding of the facts has been blurred by imprecise use of the word. It is used in two ways.

(a) "Weaning" is used as an inclusive term to mean the process of change when breast milk is being supplemented or replaced by other milks or when milk (or fluid diet) is being supplemented or replaced by semi-solid or solid foods. Both changes can occur at the same time. "Weaning" is inseparable from the change the infant undergoes in moving from the marsupial period of extrauterine life of total dependence on and close proximity to the mother to the articulate fully mobile child capable of communicating his needs and resisting in an 'adult' manner both hunger and infection. It is during this perilous period of change that the child is so vulnerable to his environment.

(b) The verb is also used to describe precise events in the weaning process and it is here that confusion arises. If, by virtue of long usage, it continues to be so used, then it should always be qualified by reference to the previous and subsequent method and type of feeding and the speed or the time from start to completion of the change of feeding.

2. COMPONENTS OF WEANING

2.1 The change from breast milk to other milk (bottle feeding).

2.2 The change from liquid to solid feeding.

2.3 The change of relationships.

2.4 The change of immunity to infection.

2.1 The change from breast milk to other milks

This is probably the most profound change the infant faces in a situation where the environment is poor in resource and should be one of the main concerns of this seminar.

Breast feeding may never be established. The change may be abrupt or gradual, temporary or more often permanent.

The main effects of this change concern :-

2.1.1. The composition of the food:

Cows milk contains more protein and salts than breast milk, allowing for more rapid growth. Other differences may be present if the milk preparation is artificial such as the recent finding of too much calcium in some proprietary milks. Effective antibody concentrations will also be less in cows milk than in human breast milk. The many complex differences in trace constituents between breast milk and other milks has been extensively studied without any conclusion of clear significance.

2.1.2. The method of feeding:

An immediate demand is laid on the mother or 'the environment' to reconstitute or adjust the substitute milk with the dangers of too dilute or concentrated a feed; to store it if necessary for it will not be available on tap; and to deliver it to the baby by bottle or cup or other utensils. The environmental hazards are reconstitution, and contamination.

2.1.3. The economics of feeding:

The cost of the milk and the methods needed to store and prepare and deliver it may be more than can be afforded or than are available. The environmental hazards are underfeeding and again contamination.

2.1.4. The mother-child interaction:

(See below under Change of Relationships).

2.2 The change from liquid to solid feeds.

The natural growth and development of the child demands that more concentrated foodstuffs be introduced to the diet of the infant. The natural process of weaning starts with supplementation or 'thickening' of the milk feeds with other, often farinaceous, foods. The supplement increases in volume and amount until it forms the main dietary intake with the milk as a supplement. Supplementary milk, which may be in the form of breast feeding, may continue for two or three years or even longer.

2.2.1. The type and composition of the food:

In many cultures in Africa the child is weaned on to the predominant adult staple foods. The concept of 'weaning' seems to be missing. These staples are often bulky and low in concentration of proteins and calories, particularly the former. The very constraint of volume which necessitates weaning begins to operate again in that the staple food on its own may be too bulky to allow more than a marginally adequate intake of essential calories and proteins. The staple is regarded as good food - satisfying the hunger, providing a warm, pultaceous bezoar filling the infant's stomach, inducing satisfaction and sleep. Any other foods - meat, fish, vegetables, are regarded as sauce into which the staple is dipped and which the infant finds difficulty in picking up, or chewing, or swallowing. Lack of variety of food is also a feature of rural subsistant cultures.

In sophisticated cultures too early enrichment with proteins and calories is leading to obesity and other nutritional imbalances - increasing for instance the tendency to hypernatraemia in dehydration.

2.2.2. The speed of change of feeding:

This is often very gradual with the introduction of 'pap' or other local weaning food sometimes premasticated. If supplementation is not adequately introduced when needed, intake will decline to marginal levels. Continuous high levels of milk intake may cause problems as the lactase levels in the intestinal mucosa of the gut fall in children of many ethnic groups.

Sometimes weaning is sudden; a bitter paint on the nipples or child removed to grandmother; illness or death of mother; or a further pregnancy. The hazards here are compounded by the emotional anorexia which may accompany this sudden deprivation.

2.2.3. The method and frequency of feeding:

In many cultures, feeding other than breast and bottle tends to be permissive, the child eating what he likes when he likes. He also is given food when the family food is prepared and shares in the family meals. This affects the frequency of feeding and may reduce feeding times from several to two or three a day.

During illness, infection or anorexia, he is not encouraged to eat and in fact in certain infections such as measles, food is withheld. All this tends to reduce intake often drastically during the weaning process.

2.3 The change of relationships. /

2.3 The change of relationships.

2.3.1. The effect on the child:

With the cessation of breast feeding much less contact between mother and child is necessary. The baby is weaned from the mother's breast and back or hip to the bottle, cot or pram. Stimulus is reduced and development retarded. Appetite may be reduced with refusal of substitute milks or other weaning foods. Reduction of the child's responses may increase maternal rejection and so produce a tendency for the deprivation to increase.

There are buffer systems preventing severe deprivation :-

(a) The extended family into which the child is naturally absorbed. Elder sisters (little mothers) often provide all the stimulus the child needs. Aunts and grandmothers also play their part. Single unmarried girls, backed up by the extended family, in rural surroundings seem to rehabilitate their babies better than nuclear families in urban surroundings. Second wives do not make good mother substitutes on the whole; jealousy and the feeling that this is not their own child tends to produce rejection.

(b) Wet nursing is sometimes culturally acceptable, in which case the mother substitute is complete.

(c) In rich resource situations, the mother either has the wealth and leisure to continue stimulating and playing with the baby, or an 'ayah' or 'amah' takes over.

2.3.2. The effect on the mother:

(a) Abrupt weaning from the breast : This may occur as a traditional demand on the mother, for instance on the discovery of a pregnancy, or the mother may reject the child for various reasons. This used to occur particularly with one of a pair of twins or an unwanted female heir. For whatever reason, the resulting reduction of the child's interaction with mother may lead to secondary loss of interest or rejection of the child by the mother.

(b) Maternal depletion or exhaustion syndrome : This describes the malnutrition which slowly overcomes a woman with an increasing family, repeated pregnancies and poverty. It is associated with decreasing breast milk supply and consequent malnutrition of the later children of the marasmic breast starvation type.

(c) Breast feeding as a contraceptive : This may be over-emphasised. Abstinence from sexual relationships demanded during breast feeding in some cultures has the most effective contraceptive effect.

(d) There may be other effects.

2.4 The change of immunity.

2.4.1. The protective effect of breast milk:

Breast milk and in particular colostrum and the milk of the first week or two of breast activity contains a considerable amount of IgA antibody active against a number of pathogens, particularly entero pathogens such as poliomyelitis.

There is also evidence that breast milk maintains an intestinal flora of lactobacilli which are inimical to other coliform invasion.

2.4.2.

Unrelated to, but coincident to the weaning process, is the rapidly waning maternal antibody level in the infant's serum.

2.4.3.

At the same time also, the infant is exposed to a high infection pressure both by droplet and ingestion. ASO titres have been shown to be very high within the first six months of life. If bottle feeding is adopted, this will increase the contamination of the environment of the baby at a time when his immunity is least and his dietary intake may be marginal. It has been shown clearly that frequent infection during this period is as equally responsible for malnutrition as the marginal dietary intake; an intake which could maintain growth but is not sufficient to allow for 'catch up' growth after infection. The weaning infant does not slide into malnutrition; he steps into it in a series of falters associated with infection and progressively less effective 'catch up' rehabilitation.

3. PATTERNS OF WEANING

Four main patterns of infant feeding have been differentiated by Raphael from which emerge subsidiary weaning patterns. These patterns are changing continually with the impact of increasing communication, modern ideas and decaying traditions.

Raphael's four patterns of infant feeding, as modified by Jelliffe et al. are :-

1. Traditional, pre-industrial (total breast feeding).
2. Urbanising poor (emerging bottle feeding).
3. Urban educated well-to-do (elite bottle feeding).
4. Naturalist urban educated (neo-elite breast feeding).

3.1. Traditional pre-industrial total breast feeding.

Here breast feeding is the norm, with minor variations at the 'colostrum' phase, weaning from the breast is late, aged one year or

more, feeding is on demand.

Weaning patterns in this group :

3.1.1. Prolonged breast feeding up to three or four years:

This is satisfactory nutritionally if the introduction of solid foods is sufficient, the breast milk acting as a supplement just as cow's milk may in more sophisticated communities.

In conditions of extreme poverty the child may be kept on the breast as his sole source of nutrition for longer than six months and 'breast starvation' may lead to late marasmus.

3.1.2. Absence of any traditional weaning foods:

Here the infant passes straight from demand breast feeding to two or three meals a day on the family staple, still only on demand. This often leads to kwashiorkor in the second year of life.

3.1.3. Early weaning from any cause and often abrupt:

There is no satisfactory replacement for breast milk and the child rapidly becomes marasmic.

3.2 Urbanising poor (emerging bottle feeding).

The decline of breast feeding in urban areas is the classical pattern all over the world. Where this is attended by an overcrowded, poor, unhygienic environment and the availability of high cost, prestigious artificial milks and weaning foods, dilute contaminated bottle feeding results in an increase of diarrhoeal disease and marasmus.

The weaning pattern is an early replacement of breast feeding for bottle feeding often given by someone other than the mother who may go out to work. Local home made weaning foods are replaced by expensive commercial weaning foods of high concentration and convenience.

This weaning pattern is invading the rural areas through commercial advertising and salesmanship, with inevitable decline of breast feeding and increasing risk of early diarrhoeal disease and marasmus.

3.3 Urban educated well-to-do (elite bottle feeding).

This is the usual infant feeding pattern in the wealthier urban quarters. Breast feeding is paid lip service in some hospitals but modern obstetric service often militates against the quiet confident proximity of mother and baby in which breast feeding only flourishes. In addition to bottle feeding being established within the first month in the vast majority, earlier introduction of convenient, highly concentrated weaning foods is resulting in obesity and possibly other harmful overloads.

3.4 Naturalist urban educated (neo-elite breast feeding).

This is a movement arising from a growing awareness of the separation which the bottle and prepacked weaning foods create between mother and child and the nutritional harm which may be associated with such feeding. The weaning pattern is breast feeding alone for four to six months with the introduction of home-prepared food mixes thereafter, breast feeding continuing up to one year or more.

4. FACTORS INFLUENCING WEANING

These can be summarised from the previous discussion.

4.1 Health of mother and child.

4.2 Economic - complex
rural subsistence encourages breast feeding
wealth often discourages breast feeding.

4.3 Social - single mother
large family - maternal depletion
urbanisation discourages breast feeding.

4.4 Cultural - climate of opinion) discourage breast
sophistication) feeding but
dress) could be
changing role of women) reversed.

4.5 'Ignorance' - different concepts of food
taboos and traditions

4.6 Education - none - assumes breast feeding natural.
some - affected by prestige symbols.
further - favours return to breast feeding.

4.7 Iatrogenic - medical and health workers advice or lack of advice.
hospital atmosphere.

4.8 Commerce - commercial 'milks') subtle advertising
commercial 'weaning foods')
expense
reconstitution
the bottle

5. /

5. THE DANGERS OF WEANING

As a result of the foregoing remarks, the dangers inherent in the weaning process in developing countries can be listed :

5.1 Malnutrition - Obesity
Anaemia and other specific deficiencies
Breast milk failure - early marasmus
Breast starvation - late marasmus
Weaning on to adult feeding with inadequate staple - kwashiorkor
Lactose intolerance

5.2 Infection - Gastroenteritis
Malaria
Respiratory infections
Others

5.3 Deprivation

6. PRACTICAL PROTECTIVE AND PREVENTIVE MEASURES

6.1 Maintain nutrition

6.2 Prevent infection

6.3 Reduce deprivation

6.1 Maintain nutrition

Practical programmes to achieve this can be divided into :-

6.1.1 Promotion of breast feeding

6.1.2 Nutrition education

6.1.3 Food supplementation

6.1.4 Dialogue with commercial companies

6.1.1 Promotion of breast feeding:

The decline of breast feeding has been said to be one of the gravest public health problems of the developing world, so that programmes to halt and reverse this decline are needed urgently. In many areas these must be preceded by integrated studies of the responsible factors.

Most /

Most of the work so far in this subject has been carried out in the United States, Scandinavia and to a lesser extent in the United Kingdom. It has been based on modifications of hospital procedures to allow for greater antenatal confidence in breast feeding, more continued contact between mother and newborn baby if necessary in a 'rooming-in' situation, and the formation of voluntary breast feeding associations actively supporting and informing women desiring to breast feed - such as La Leche League International, Natural Childbirth Trust (U.K.) and Ammehjelpen (Norway).

A great deal needs to be done to alert Governments to the seriousness of the problem and encourage "adequate social measures for mothers working away from their homes during the lactation period, and to review sales promotion activities on baby foods and to introduce appropriate remedial measures, including advertisement codes and legislation where necessary." (W.H.O. Rep. 27th World Health Assembly Agenda Item 2.2.3. 18/5/74).

The most crucial need is to find practical ways of changing attitudes and the climate of opinion about breast feeding, of inducing an atmosphere conducive to breast feeding.

6.1.2 Nutrition education:

The components of practical programmes of nutrition education are :-

(a) Target groups

Mothers with malnourished children using the cure to teach prevention
Community leaders
) at nutrition rehabilitation units

School children (particularly secondary girls) - Cookery or nutrition clubs have been formed and local recipes from different cultures prepared and eaten. Children may influence parents and will certainly become parents themselves one day.

Teachers at Teacher Training Colleges.

Medical, Nursing and Medical Auxiliary students.

(b) The use of the weight chart to define and detect children 'at risk' of malnutrition and to assess the success of nutrition rehabilitation (and education).

(c) /

(c) Nutrition rehabilitation units. These units may be of various sizes from a central teaching establishment to a two roomed model house and garden attached to a dispensary. They are aimed at teaching the mother and community that malnutrition can be cured and prevented by food grown, prepared, cooked and fed to the weaning child in the local area. They aim to wean the mother and community from dependence on the hospital, medicines and supplementary food in the overcoming of malnutrition.

(d) Teaching sessions at follow up home visits, club meetings, maternity villages, mobile clinics, etc.

(e) The basic lessons:-
Diversification of diet, recipies, etc. Monotony ~~Monitoring~~ of diet and dependence on staple low protein containing foods tends to increase the risk of malnutrition. A mixed diet prevents malnutrition. This can best be taught at schools in nutrition clubs.

Use of local foodstuffs in weaning multimixes - accompanied by meaningful local terms for such mixtures (ettu, kitobero, etc.)

Promote gradual weaning from the breast.

Maintain frequency of feeding during and after weaning.

Cook the child's food separate from the family meal.

"Get well - stay well", the cure of malnutrition by good mixed feeding teaches prevention.

(f) The techniques :-
Lay teachers - the mothers and community leaders often make very convincing teachers themselves.

In nutrition rehabilitation the mothers are actively involved in the cure rather than passively observing.

A barrage of experience - integrated learning involving agriculture, animal husbandry, storing, hygiene, building, protecting springs, family planning, forestry, etc.

The 'we' relationship is encouraged, in which all that happens is identified with the home situation and only what can be done there is taught.

Communication is exerted through the culture pattern by songs, dances, proverbs, calendars, films, etc.

The mass media is used as much as possible.

6.1.3 Food supplementation:

(a) Promotion of local weaning multimixes.

(b) Control of imported expensive weaning supplements or substitutes.

(c) It should be with considerable reluctance that recourse is made to supplementary feeding programmes using imported or surplus food or milk preparations from another country. The danger of creating 'dependence' on these supplies and stifling home production has to be faced if these gifts are accepted. They should only be accepted in emergency situations.

6.1.4 Dialogue with commercial companies:

Commerciogenic malnutrition is becoming increasingly important. The results of advertising artificial milks and ready to eat weaning foods have been discussed: decline of breast feeding and increasing infant morbidity from diarrhoeal disease, marasmus and obesity. Some commercial firms are recognising this and are in a very difficult position. They have begun to help promote breast feeding and are seeking ways to reduce the effect of their products. It is no good medical and health workers denouncing them or burying their heads in the sands. A combined study of the problem is needed, and it is hoped that this seminar may propose some action in this very important area.

6.2 Prevent infection.

6.2.1 Active immunisation:

6.2.2 Breast feeding:

6.2.3 Control of contamination: This needs perhaps some expansion. It is largely the problem of the bottle - a utensil which is difficult to keep clean in the absence of modern conveniences and readily available boiling water. Various devices have been suggested such as antiseptics (like Milton). Cups and spoons can be cleaned easily and are used in hospitals where the problem is recognised. The technique of cup and spoon feeding has to be learned and patience is needed to ensure adequate intake. This is a subject which needs further investigation.

One important point must be made here. During and after infection the infant must continue being fed and watered. He is liable to become rapidly dehydrated especially if he is feverish or has diarrhoea and/or vomiting. If he cannot tolerate milk, then some fluid must be given, and as soon as possible he must be encouraged

to eat again so that adequate "catch up" can be achieved. In some cultures there are old wives tales or traditions or taboos which mean the child is starved with a fever. This needs correction.

6.3 Reduce deprivation.

6.3.1 Child spacing:

Delaying the mother's next pregnancy until the child is fully weaned allows her to concentrate on supplying breast milk and introducing a weaning diet in the first and second years of her child's life. It also enables her to replete her reserves by preventing a continuous flow of pregnancies. The emphasis is on child spacing. This is a relatively easy concept to teach. In one country in East Africa there are local proverbs illustrating the fact that a few good coffee bushes, a few good laying hens, a few healthy cows, are worth more than many bare coffee bushes, many poor laying hens, many thin cows, etc. The analogy is clear.

With increasing opportunities of education, the motivation for fewer children is further increased. Life at subsistence level does not allow for planning, for a day at a time is sufficient and protects from disappointment or false expectations. Immediately saving or education or storing become possibilities, then planning is also possible and family planning a part of the whole.

Child spacing and family planning must be introduced in the course of a general enfranchisement of the community, as part of a whole health and social and economic service.

6.3.2 The encouragement of persisting with breast feeding:

This has already been discussed.

6.3.3 The use of 'substitute mothers':

This is a tradition in some cultures going as far even as 'wet nursing'. The substitute mother is often the eldest sib, the aunt or the granny. It is important that nutrition education be aimed at those people likely to be the substitute mother on return home.

6.3.4 Family stability:

With increasing movement from rural places to towns, from polygamy to monogamy, from traditional and religious constraints to 'free' relationships, the family is tending to break up. This break up of family life affects the weaning child most of all; the 'womb'

of the family is no idle phrase and in it the child, even deprived of his mother, can find relationships and security. If there is no family 'womb' the child is at risk of total insecurity and deprivation if mother abandons him or cannot look after him. Family life needs buttressing.

6.3.5 Institutions:

Replacements of the family by institutions can be helpful. The kibbutz organisation is a classical example. The place of creches and day care centres in the event of mothers in employment and the methods of feeding and stimulation they use is a subject relevant to weaning but of which the author has no experience.

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