NUTRITION IN PREGNANCY*

BY

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In all discussions upon nutrition many problems and difficulties arise, as the subject involves not only the physiological requirements of the individual but social and economic factors. When the question arises as to what is a suitable diet in pregnancy the problem is even more complicated, as it involves not only the maintenance of maternal health but in addition the nutrition and growth of the foetus.

The reduction of maternal mortality has now become a national responsibility, and if further progress is to be made more attention must be paid to nutritional defects in the diet of the expectant mother. The more one studies the diseases of pregnancy and even the complications of childbirth, the more is one convinced that these owe their origin in many cases to dietetic defects and that they should be classified as deficiency diseases. In spite of all the valuable research that has been undertaken with regard to nutrition both in man and in animals, it is only during the past few years that these results have begun to be applied to obstetrical practice.

The maternal organism has not only to maintain its normal condition of nutrition but it has to act as a storehouse for the needs of the foetus. If these reserves become depleted at any time the foetus may become a parasite upon the maternal host, as it is imperious in its demands for growth and maintenance. We know that, for example, the liver stores up glycogen, calcium, iron, and other substances for the needs of the foetus. If these reserves become inadequate the result is shown by the onset of anaemia, toxæmia, eclampsia, or vomiting of pregnancy. If the supply of vitamins and mineral salts is deficient abortions and stillbirths may take place. Such knowledge has been of inestimable value clinically in the treatment of the complications of pregnancy by substances which after all reinforce, one might say, the diet of the expectant mother.

It is within the bounds of possibility that one of the chief determining causes of puerperal sepsis, which is responsible to a large extent for the maternal death rate, is defective nutrition, with the consequent lowering of resistance to infective organisms.

Importance of Diet

In the ordinary course of work in an ante-natal clinic we find that many patients complain of dyspeptic disturbances, muscular cramps, sleeplessness, backache, and other symptoms during pregnancy. These can be treated with good results not by sedatives as formerly but by the administration of mineral salts such as iron and calcium and by careful advice as to diet, together with the observation of routine weighing and control of open-air exercise. If we could prevent the occurrence of such symptoms by dieting the results would obviously be much more satisfactory.

Infant mortality has been reduced to a very marked extent not by the discovery of new methods of treatment but by the careful attention to diet and general hygiene which is carried out in infant welfare clinics. The establishment of these clinics has reduced the admission to hospitals of children suffering from deficiency diseases such as rickets.

My aim in the present discussion is not to stress the subject of diet deficiency in pregnancy so much as to endeavour to obtain some practical solution for the problems we meet with in the ante-natal clinics attended by working-class mothers.

How much time does the average medical officer of a clinic spend upon each patient in giving advice as to her diet? What are the possibilities of carrying out this advice when given? The average woman cares little about the mathematical exactitude of the caloric value of foodstuffs or their vitamin contents. Her concern is the best possible return for her financial outlay, so that the hunger of her family may be satisfied. Her attention is directed towards appetizing foodstuffs which give little trouble in preparation and allow of the smallest amount of waste. Too often do we find that in the poorer districts the patient sacrifices her own needs to those of her family, and it is for this reason that the supply of food for those in attendance in clinics has been somewhat of a failure. The problem of expense is the greatest difficulty when we know that the chief source of vitamin supply is to be obtained from fresh dairy produce and green vegetables. Not only is the price prohibitive, but there is the difficulty of obtaining pure milk and fresh food. Even in pastoral counties I have known of instances where it is impossible to obtain an adequate supply of milk for expectant mothers. Dairy produce is purchased in quantities for the supply of cities and the local requirements are neglected. Green vegetables are as a rule prohibitive in price, especially in the winter months.

The whole question of diet and supply must be discussed from a common-sense and practical standpoint. We must not try only to adapt the patients to existing conditions, but must improve those conditions of supply to what we consider just demands. It is an easy way out of the difficulty for the medical practitioner to order gallons of cod-liver oil and tablets of mineral salts, but it is an artificial method of procedure. Fresh herrings, which contain life-giving vitamins, are often unobtainable because of the difficulties of transport, and for this reason are thrown back into the sea.

What is the diet of the average working-class mother of to-day? We have only to look at the shops in the country villages as well as in towns. Windows are heaped with bread made from milled flour, which is now the substitute for the home baking of our ancestors. It is cheap and satisfying, and is ready prepared. There are piled up tins of every conceivable form of foodstuff, meat, vegetables, and fruits, which are not an addition to the diet but a substitute in many cases. These tinned foods are appetizing, are ready prepared, and have little waste, but in spite of assurances to the contrary they can never replace fresh foods. Supplies come from abroad from long distances, and we find our working classes consume chilled meat, imperfectly thawed and then cooked out of all recognition of its original nutritional substances.

How many ante-natal clinics or hospitals concern themselves with lessons in the preparation of foodstuffs? Do our rural institutes give demonstrations in food expenditure and values and in the storage of perishable articles? It is all very well for our laboratory workers to publish lengthy treatises on food values or the amount necessary for family maintenance. The whole commissariat system breaks down in the hands of the woman of the house, whose lack of knowledge of cooking and storage is responsible for the destruction of the main vitamin content of the food she supplies to herself and her family. An indescribable amount of waste takes place in homes

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because of lack of proper storage. Deterioration rapidly occurs in milk and vegetables, and it is not to be wondered at that so many suffer from malnutrition and come to the hospitals with complaints due to digestive disorders.

Conclusion

I know all this may seem below the standard of a scientific discussion, but in my opinion little progress will be made until we tackle the problem from this point of view. It is a national concern which involves the support of our own agricultural producers, the transport of foodstuffs, the wise buying, education in cooking, and the provision of houses where facilities for storage are made available.

The problem of maternal nutrition is a national one and we can all help in its solution, but the methods we employ must be in co-operation with other forces outside our own profession.

DIETARY REQUIREMENTS IN PREGNANCY AND LACTATION *

BY

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The efficient performance of the function of reproduction is closely associated with the nutritional state of the reproducing female. This is clearly recognized by the farmer when feeding his cows, sheep, and pigs, and much of his success as a farmer is dependent upon his application of this knowledge.

The reproducing female requires, in addition to the dietary constituents (adequate in quantity and variety) necessary for her own bodily maintenance, supplementary quantities of many foodstuffs in order to nourish her offspring both *in utero* and at the breast. The question of how intimately successful reproduction in the human being is associated with nutritional factors has not yet received the attention it deserves. Consideration of maternal mortality and morbidity, of abortion, miscarriage, and stillbirth, of neo-natal and infantile mortality, has, it seems to me, been orientated too closely to the pathological and infective processes which may be the terminal factor in obstetric disaster, and too little to the fundamental factors of nutrition which may prove to be the precursors of the morbid conditions just referred to. There is much basal truth in the suggestion made by Dame Louise Mellroy in 1935 that the solution of the problem of maternal mortality and morbidity lies in the kitchen rather than in the laboratory or hospital ward.

There are those who have advocated a restricted intake of food during pregnancy in order that the birth weight of the child may be kept low and so ensure easy delivery. The balance of evidence, however, appears to indicate that the birth weight is uninfluenced by restrictions of diet that are likely to be submitted to by the expectant mother. Further, there appears to be little reliable evidence to support the contention that excessive eating by the mother results in the production of overweight infants, whatever effect it may have on the maternal organism. Nor is it certain that food restriction during pregnancy reduces the incidence of toxæmias; for there now is evidence supporting the view that it is food re-

strictions or deficiencies that are potent causal factors in the production of the toxæmias which we have tried to avoid by cutting down the quantity of food eaten.

It appears to me that the mere determination in grammes and milligrammes of the minimal requirements of the pregnant woman for the proximate principles of a satisfactory diet is of academic rather than of practical importance; for as deficiencies seem to be of more consequence than excesses there must be in the field application of laboratory findings a factor of safety introduced which, in the daily routine of marketing and cooking, has of necessity to be somewhat generous. The idea that special diets are essential for the reproductive phase of female activity does not coincide with physiological dicta. If the diet of a woman of reproductive age requires, during pregnancy, additions not merely quantitative in nature it is indicative, not that she needs new substances for the purpose of gestation, but that her previous diet was inadequate.

The quantity of food eaten, expressed in mere calories, is of little practical importance. Gross shortage of calories, except among a very small section of the impoverished, is rarely encountered. A deficient calorie intake can be easily and cheaply corrected by the addition of cereals and/or sugar, and little anxiety need be felt on this score. The unfortunate factor is that if the calorie intake is mainly derived from carbohydrate sources these substances may bulk too largely in the total intake and may, by substitution, reduce below the safety level the ingestion of foods containing protein, minerals, and vitamins. There is real danger of this among women who exist at a low income level.

There is a lack of reliable data as to the optimal intake of fat during pregnancy. It is probable that the kind of fat eaten is of more importance than the quantity, and that the varying value of fats from different sources lies not so much in their chemical composition as in the extent to which they act as vehicles for various vitamins. Linoleic acid, however (a constituent of some fats), does seem to have special qualities.

There has been much controversy as to the role of protein during pregnancy. Many practising obstetricians advocate a low protein intake in order to avoid toxæmias. I suggest that this attitude be examined with care. The League of Nations Technical Committee recommends 2 grammes of protein per kilo of body weight. Those who advise a diet containing a large quantity of milk do not seem to realize that they are recommending large quantities of protein and in a form in which there is no loss from cooking such as occurs with flesh proteins. Terroine, mainly on theoretical grounds, is an advocate for a low protein diet at all ages, but the recent work of McCance and Widdowson on the losses of protein during the preparation and cooking of food points to the advisability of a safety factor in consumption much greater than theoretical considerations warrant. Analysis of the food intake of the poorer sections of the community shows that the amount of protein is often very, very low, and is even precariously near the maintenance level of the mother herself. Some native races, notably the Eskimo, consume enormous quantities of protein, and apparently without ill effect.

Mineral Requirements

Minerals constitute an essential part of the dietary of pregnant women and, certainly among the poor, deficiencies in these substances are not uncommon. Anaemia is very often present in those with restricted income, and the degree of anaemia seems to be progressive, the

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