REFRESHER COURSE FOR GENERAL PRACTITIONERS

THE USE AND ABUSE OF VITAMINS

BY

L. S. P. DAVIDSON, B.A., M.D., F.R.C.P.*Professor of Medicine, University of Edinburgh*

During the past 40 years discoveries in medicine and related sciences have led to an immense improvement in the health, happiness, and efficiency of millions of human beings throughout the world. In no branch of science have more important advances been made than in nutrition. The fascinating story of the discovery of the vitamins, the dramatic changes produced by their deficiency, and the remarkable therapeutic effects which result when they are supplied to individuals who have been eating an inadequate diet have received great publicity in both lay and medical press. The imagination of all who have heard or read about these discoveries has been stimulated and captivated. It is not surprising therefore that there has arisen a demand for vitamin preparations which has led to their manufacture and distribution on an enormous scale. But there is little doubt that at present large quantities of these preparations are consumed by individuals who can expect to receive no benefit whatsoever from them, since they are not suffering from nutritional deficiencies. The medical schools of Great Britain must shoulder their share of responsibility for the continuation of this unsatisfactory state of affairs, since it indicates that many members of the medical profession must have received insufficient training as undergraduates or postgraduates in the science of nutrition. Better instruction is essential to enable doctors to assess properly the validity of the claims made for vitamin preparations in the advertisements with which they are daily bombarded, and to investigate adequately the dietetic history of patients they suspect of suffering from nutritional deficiency.

Confronted with a patient complaining of such symptoms as fatigue, lassitude, loss of appetite, irritability, or insomnia, which are repeatedly stressed in advertisements of vitamin preparations as being the stigmata of subclinical states of nutritional deficiency, there is danger of the doctor prescribing a vitamin preparation without first fully investigating the physical, social, and environmental factors that so commonly lead to similar subjective features.

General Considerations

(1) It should constantly be remembered that in Great Britain fully developed states of vitamin deficiency such as beriberi, scurvy, and pellagra are very rarely encountered. When they do occur they usually appear in individuals of a certain type—elderly persons, frequently males who live alone, and in people with abnormal mental states who are either unable or unwilling to eat a normal diet. They also arise as “conditioned” states of vitamin deficiency—as a result of gastro-intestinal disorders which lead to a failure in digestion and absorption, or from the increased demands which occur during pregnancy and lactation, rapid growth, or markedly increased metabolism.

(2) Food supplies at present available from rationed and unrationed sources in Great Britain are capable of supplying all nutritional demands, provided the individual has some knowledge of what constitutes a reasonably well balanced diet. This has been clearly established from our

knowledge of the total supplies of food available for distribution, from studies of the consumption of food by large numbers of working-class families, and from public health statistics. The general practitioner, if adequately trained in the science of nutrition, is the proper person to give advice to the family on how to eat, when to eat, and what to eat.

(3) It is a well-established fact that, if an individual is eating a sufficiency of any vitamin, supplementation of the diet by a vitamin preparation will effect no benefit and is therefore wasteful and uneconomic.

(4) Although the dominant clinical features may suggest a deficiency of one particular vitamin, experience has shown that deficiency of a single nutritional factor is seldom present alone. Almost invariably the diet will be found to be lacking in several factors. The administration of a single or multiple vitamin preparation without correcting the diet as a whole will lead to little or no benefit. This finding has been noted by many observers, including myself. I found no beneficial effects from supplying a preparation of vitamin A and D to school-children whose diet was defective in several factors, including protein, minerals, and vitamins. The children were drawn from the poorest classes and were investigated during the years of depression between the two world wars. At about the same time, in another region of Scotland, excellent effects on the health and growth of a similar group of children resulted from supplying them with a pint of milk daily. The psychological effects of giving vitamin preparations were clearly demonstrated in the former experiment, since many of the school teachers concerned in the experiment reported dramatic benefits in children whom they believed to be taking vitamins A and D but who were in fact being given an innocuous preparation of arachis oil in capsules identical with those containing the vitamins. This clearly indicates the need for caution on the part of a doctor in accepting subjective improvement after the administration of a vitamin preparation as being necessarily due to the correction of a state of pre-existing nutritional deficiency.

(5) Recent advances in knowledge call for a reconsideration of the generally accepted standards of vitamin requirements for the maintenance of health. The proof that many vitamins are manufactured in the alimentary tract by bacterial syntheses is a discovery of the greatest interest and importance which largely explains the variable incidence of vitamin-deficiency diseases in individuals ingesting a similar diet. This fact also explains the difficulty in deciding what values should be accepted as desirable for the maintenance of health.

Information derived from studies of human volunteers living on a diet almost completely devoid of vitamins A and C (see references to Table) clearly shows that many months must elapse before symptoms or signs develop, and that clinical features will disappear completely on supplementing the diet with amounts of vitamins considerably lower than those formerly accepted as necessary. These investigations strengthen the view that the food supplies

TABLE

Vitamin	Recommended Daily Allowance	Therapeutic Dose	Foods of Special Value
Aneurin (vitamin B ₁)	1-2 mg.	10-50 mg.	85% extraction wheat flour, oatmeal, peas and beans, eggs, meat and offal
Nicotinic acid	10-20 mg.	200-500 mg.	
Riboflavin ..	1-2 mg.	5-50 mg.	As above, and milk and cheese
Ascorbic acid (vitamin C)	30 mg.*	200-500 mg.	Fruits, esp. citrus, currants and berries; green vegetables, tomatoes, potatoes
Vitamin A ..	2,500 I.U.†	25,000-50,000 I.U.	Eggs, cheese, milk, butter, vitaminized margarine, liver, fatty fishes, green and yellow vegetables
Vitamin D ..	Adults: (?) 100 I.U.; infants, pre-school children, pregnant and lactating women: 400-800 I.U.	1,500 I.U. up to 100,000 I.U. in special cases	Eggs, milk, butter, vitaminized margarine, fatty fishes (Note the importance of sunshine in promoting the synthesis of vitamin D in the skin)

The following vitamins are not included in the Table because their place in human nutrition is not clearly established or because they are only used for the treatment of certain pathological states: Pyridoxin, pantothenic acid, biotin, para-aminobenzoic acid, folic acid, vitamin B₁₂, vitamin E, and vitamin K.

* A preliminary report by Vitamin C Subcommittee of the M.R.C. (*Lancet*, 1948, 1, 853).

† M.R.C. Special Report Series No. 264, 1949.

available to the people in Great Britain are more than adequate to meet the vitamin requirements of the population without supplementing them with vitamin preparations, provided a reasonably intelligent selection of the available foods is made.

Prescription of Vitamins

Vitamin preparations have been prescribed for:

- (1) Supplementing the diet to make it optimal for growth and the maintenance of health.
- (2) Treating so-called "subclinical" states of vitamin deficiency.
- (3) Treating fully established "frank" vitamin-deficiency diseases.

Bearing in mind the general considerations discussed above, the practitioner should make the following investigations before prescribing vitamin supplements:

- (1) Take a careful history and make a full physical examination to determine the presence or absence of subjective phenomena or objective signs indicating vitamin-deficiency states.
- (2) Consider whether any clinical features discovered are due to emotional states or organic diseases which can produce symptoms and signs simulating closely those of subclinical and "frank" vitamin-deficiency states.
- (3) Take a careful dietetic history to determine whether there is evidence to show that the patient has in fact been eating inadequate quantities of essential nutritional factors.
- (4) If the clinical features are in keeping with the existence of a state of vitamin deficiency and yet the dietary history does not suggest it, a search should be made for causes which are known to enhance the requirements for vitamins—malabsorption from the intestinal tract, pregnancy and lactation, rapid growth, infections, and states of increased metabolism. If no positive evidence can be obtained that a direct or conditioned state of nutritional deficiency has preceded the onset of the clinical features under investigation, it is extremely unlikely that they are nutritional in origin and it is illogical to treat them with vitamin supplements. The case should be carefully reviewed with particular reference to the possibility of hidden organic disease and to the factors operating in the home and at

work which lead to psychological symptoms simulating those of subclinical states of vitamin deficiency.

Vitamin Supplements

Vitamin supplements should therefore only be prescribed as follows.

(1) *For the Maintenance of Health.*—Since all the factors required for the maintenance of health can be obtained from the food supplies and the extra supplements available in Great Britain at the present time, there would appear to be no adequate reason for the widespread prescription of additional vitamin supplements. Common-sense instruction on what foods to eat regularly is all that is required. The Table indicates foods which are the main sources of the most important vitamins in human nutrition.

It should be remembered that the concentration of a vitamin in any article of food is not necessarily the main consideration. For example, watercress has a high content of ascorbic acid compared with potatoes, but, as most people eat no watercress or only a very small amount occasionally, the humble potato is a far more important source of the vitamin. Another point to remember is in connexion with the method and rate of extraction of flour from wheat now in operation in Great Britain. The present process has so greatly increased the consumption of the B vitamins as to have largely solved this particular nutritional problem which was of such great importance in pre-war days, when 70% extraction white flour was the main source of carbohydrate. During the war the importation of fats, fruits, and vegetables had to be greatly restricted, with the result that nutritional experts were gravely concerned about the possible development of disorders due to a deficiency of vitamins A and C. Fortunately no such development occurred. Since the end of the war, fruits, particularly citrus fruits, and green and yellow vegetables have been imported in large quantities. These food-stuffs are available to augment the intake of ascorbic acid and carotene during the winter and spring months when the home production of fruit and vegetables is at its lowest.

Feeding experiments in human volunteers suggest that the requirements of vitamins A and C for adequate nutrition have been overestimated in the past. Even the figure of 2,500 I.U. of vitamin A given in the Table is about twice the suggested minimum protective dose required by the average individual. Hence there is little doubt that all vitamin requirements can be adequately met at the present time from food supplies readily available.

If an individual is taking the following helpings of food it is difficult to believe that he could suffer from any vitamin deficiency.

- (1) An average helping of meat, poultry, rabbit, offal, or fish daily.
- (2) 1 to 1½ oz. (42.4 g.) of fat daily (butter, vitaminized margarine, or cooking fat).
- (3) 1 egg or ½ oz. (14.1 g.) of cheese daily.
- (4) ½-2 pints (0.28-1.1 litres) of milk daily (according to such factors as age or pregnancy).
- (5) 1 large or 2 moderate helpings of green or yellow vegetables daily.
- (6) 1 large or 2 moderate helpings of potatoes daily.
- (7) 1 helping of fresh fruit twice or thrice weekly.
- (8) As much bread, scones, and cakes made from 85% extraction flour as desired.

When an individual is submitted to nutritional stress vitamin preparations may justifiably be prescribed. Special provision has been made for these purposes in Great

Britain by the Food Rationing (Special Diets) Advisory Committee of the Medical Research Council. Supplements of cod-liver oil and orange-juice and additional quantities of milk are provided for pregnant and lactating women, for infants, and for children too young for school. It is undoubtedly wise to give these supplements to children up to the age of 5, particularly in winter time, and to school-children who are growing too quickly or who have had severe febrile illnesses. For adults, vitamin supplements should be very rarely prescribed for the maintenance of health except when there exist the additional strains and stresses already mentioned which enhance the need for vitamins.

(2) *For the Treatment of Subclinical Vitamin Disorders.*—The diagnosis of states of subclinical deficiency of vitamins is based not on objective signs but on subjective features. Even with the help of laboratory tests which are not readily available to general practitioners (e.g., plasma determinations of vitamins and saturation tests), it is far from easy to be sure that the symptoms complained of are nutritional in origin. While some physicians think that subclinical deficiency states are extremely common in Great Britain at the present time, others hold there is little satisfactory evidence to justify this view. I believe that the frequency of such states has been much exaggerated. Monotony of the diet and the frustrations and restrictions accompanying post-war life in Great Britain probably account for most of the subjective features attributed to states of vitamin deficiency. If, however, after making the requisite investigations discussed above, the doctor concludes that there is a state of subclinical nutritional deficiency present, he should treat the deficiency by ensuring that the patient takes a properly balanced diet. If this is done there will be no need or justification for prescribing vitamin preparations except when there is clear evidence of the patient being submitted to one or more of the above nutritional stresses.

(3) *The Treatment of Established Vitamin-deficiency Diseases.*—As already mentioned, frank deficiency diseases such as scurvy, pellagra, and beriberi are rarely encountered in Great Britain at the present time. Careful investigation of any such case that may be encountered will almost invariably reveal multiple deficiencies of protein, minerals, and vitamins. Correct treatment accordingly demands that the diet as a whole should be carefully reviewed and made adequate in all respects. In addition, vitamin supplements should be given in the therapeutic doses shown in the Table until all symptoms and signs of deficiency have disappeared.

Conclusions

If the views expressed above are accepted, it follows that vitamin preparations should not be prescribed routinely for the maintenance of health or the treatment of subclinical states of vitamin deficiency; the best way of treating these conditions is by instructing the patient how to choose and prepare a well-balanced diet adequate in all nutritional factors. Supplements of vitamins are indicated only when causes are found to be operating which greatly increase nutritional requirements. Frank vitamin-deficiency diseases are rare in Great Britain; their treatment consists in correcting the diet in all respects and supplementing it with appropriate doses of vitamin preparations. Accordingly it is suggested that if more attention were given to the proper diagnosis of nutritional deficiency, to the taking of a careful dietetic history, and to the principles governing the prescription of vitamin preparations discussed above much unnecessary expenditure would be avoided. The discovery and elimination of social and environmental factors

which lead to symptoms simulating those of subclinical states of vitamin deficiency will produce better and more permanent results than will be achieved psychologically by the administration of vitamin supplements to individuals who are not suffering from a nutritional deficiency.

A MEDICAL VIEW OF THE SOVIET UNION

BY

M. T. GILLIES, M.B., B.Chir.

A year's stay in Russia is small qualification for anyone to express views on the country, but the experience for a medical man is sufficiently unusual these days for a few brief and entirely superficial impressions to be worth recording. It should be added that these observations are the outcome of an Embassy appointment in Moscow and are made with a knowledge of the limitations of outlook and opportunity that such a post entails.

No remarks on Soviet standards of medicine can possibly be made without a thorough knowledge of, and free access to, their institutions and hospitals. Under existing conditions this was denied me. Hospitals could be visited in connexion with foreign patients, but such opportunities were infrequent and their scope limited. Persistent efforts were, in fact, made to visit officially one particular Russian medical man of eminence, all of which, however, were deftly parried by VOKS, the Soviet organization for promoting cultural relations with foreign countries. In view of the recent disappearance and strongly rumoured arrest of a Russian surgeon of international repute it would not have been prudent to pursue the matter or the man further.

As the home of the first system of socialized medicine, Russia has obvious interest for us while our own National Health Service is being established. There are certain differences. A fundamental one is the absence in their system of the general practitioner. The smallest unit is the polyclinic, roughly equivalent to a health centre, which has a regional or occupational basis—that is to say, its clientele belong to a certain district or to a particular class of workers. Individual private practitioners do exist, but their activities are limited by lack of access to hospital accommodation and by strict limitations on their power of certification. A recent change of policy in the organization of polyclinics is evident from the following paragraph from *Pravda* for January 6, 1949.

"By a decision of the Government, the Ministry of Public Health is now carrying out an important reform of medical services to the population. The existing polyclinics and dispensaries are being merged with the hospitals and clinics. As a result of this merger the dispensary physicians have begun to work in the hospitals as well, and for their part tens of thousands of specialists in clinical work have come to the reception rooms. This system is noticeably improving the quality of medical services to the population."

Thus it seems that the present Soviet trend is towards centralization or affiliation of all medical services to some sort of parent hospital, whereas we envisage with the setting up of health centres what will be to some extent the opposite tendency. Two other small points may be noted. Medicines and spectacles, let alone wigs, are not issued free, but the sum charged is not high. Secondly, it is significant that private practice among dentists is very flourishing and, so far as one can tell from casual acquaintances, their services are widely used. Incidentally the inauguration of the Health Service in Britain was the occasion for a violent article in *Meditsinsky Rabotnik* under the heading "A new law, a fresh burden on the shoulders of the workers of Britain." The provisions of the Bill were completely ignored and the author, a doctor, expatiated instead on the inadequacy of the medical services in England and the low standard of living of the masses—quoting freely from the correspondence columns of the *B.M.J.*

On the purely domestic side of Embassy practice specialist opinions and hospital treatment were arranged through a special diplomatic polyclinic, designed exclusively for the use of the foreign community. This was the one place where consultations could be held and opinions on medical and other matters