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The Elderly

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Although everyone talks about the right food for the elderly, few people know much about the actual requirements of the elderly. There is the excuse that it is only in this century that the elderly have formed any considerable proportion of our population. It is estimated that in the next 20 years some 17 to 18 per cent of our population will be of pensionable age and will equal in numbers those under the age of 15, therefore there is a real need for knowledge in this field.

Throughout history, diet has interested mankind because of its supposed influence on health, and particularly longevity. One finds references to this in the ancient Chinese writings. Cicero also had quite a lot to say on the subject, and in more recent times Metchnikoff held the view that eating certain foods might prolong life.

The span of life is determined primarily by the gene structure, although environmental factors may play an important role since they may predispose to or inhibit disease processes or alter the rate of growth. What we are not at all certain about is that there is any specific process of ageing. No one has ever proved that there is a specific biological process of ageing, but we do associate the passage of years with involution, senescence and decay, whence it has been assumed that the elderly will require less. Even so august a body as the Food and Agriculture Organization, with trepidation admittedly, has dared to suggest a calorie intake for different ages. When one observes what people really eat one finds a number of very surprising facts. There have, since the end of the second world war, been a number of interesting surveys on the food requirements of the elderly living in institutions and hospitals. They have not been entirely satisfactory, but one survey compared the diets consumed by elderly people living alone, elderly married couples living in their own homes, and elderly people living in a variety of welfare homes.

The most interesting feature is the same as the one Professor McCance mentioned yesterday, namely the extreme variability of the dietary intake. In Pike's survey in London in 1947, the variation was from just over 400 to nearly 3,000 Calories per day, the average being very much lower than the latter figure. The subjects ranged in age from 65 to 80 years. The average values for men were 1,700 to 1,800 Calories and for women 1,500 Calories. This is in striking contrast with results of the national food survey, which suggested

that elderly men (i.e. over 65 years) were taking 2,900 Calories per day and elderly women 2,400 Calories per day. In a survey carried out in the United States amongst what were termed middle-class people, presumably comparatively well off, the intake was on an average between 1,500 and 1,800 Calories per day; furthermore, the investigators felt that if the intake did not fall below 1,500 Calories per day, all was well. Hobson, Pemberton, and their co-workers carried out a survey in Sheffield based on a true population sample. The investigators interviewed 1 in 30 of the men over the age of 65 and women over 60 on the food register (a total of nearly 2,000 people) and analysed their food intake. There were nearly 500 in the sample but unfortunately only 340 were able to complete the survey, so that it was not strictly representative. The figures showed a range of calorie intake of from 1,000 to 3,000 Calories per day. These figures refer only to what the people ate and no enquiry was made as to why they consumed or abstained from certain items of food.

More interesting has been some recent work in Switzerland, where the diets of elderly peasants living in the mountains were studied. These elderly men and women, over 70 years of age, were haymaking and carrying loads of hay on their backs 1,000 feet up a mountain to stock the sheds with winter feed for the cattle. They were consuming on an average between 3,300 and 5,000 Calories a day, and they were doing work equivalent in severity to that one expects of a young man. This proves that the elderly are capable, as McCance showed in his work in Germany, of taking a full diet and utilizing it. In a Glasgow study, energy output and food intake in elderly people were compared in different kinds of jobs. Women will be rather annoyed to know that ordinary housework consumes little more energy than when standing and certainly very little more than sitting. Even cleaning the windows is not a very energy-expending occupation. But a close correlation was found between energy expenditure and energy intake. Elderly women consume about 2,000 Calories a day, spending about a quarter sitting, a quarter lying and a quarter standing while the rest is spent on other occupations. Many elderly men performing heavy work consumed as much as one would expect a younger man to consume.

So it would seem that one of the most important things in deciding the calorie needs is the amount of energy expended, and therefore in looking at the diets of the elderly one should always bear this in mind. One has to take into account, of course, the completely different character of work and living to-day, since so few jobs now involve the heavy expenditure of energy common even 20 years ago. Daily energy expenditure is often low even in people employed in heavy industry like steel and coal mining, unless they are employed

at the coal face or continuously working with molten metal. Careful analysis frequently reveals that it is only for short periods that the men are working all out.

When we look at the factors that lead to the discrepancy between what one might call the expected requirements and the actual intake, we get clues as to some of the nutritional problems of the elderly. There is undoubtedly the economic factor. Those who are elderly and living on their pension find it very difficult to make ends meet. A personal survey with particular relation to diabetes brought this out very clearly. Analysis of the money distributed by the National Assistance Board indicates that the grants are very largely used to supplement the diet. The economic difficulties are not confined to this country. It is probably not often realised that three-quarters of those over 65 years of age in the United States have an income not exceeding 1,000 dollars a year. Lack of financial means is a very important factor for the elderly.

There are other sociomedical factors and physiological ones. We do not yet understand the full significance of the diminution of tissue with ageing, the lessening in intestinal secretion, the reduction in size of the kidney, or the much lower hormone levels. We do not understand what this means, whether it is again merely adaptation to supply and demand, or whether it is some indication of a mysterious process called ageing. We do know, though, that such factors may affect nutrition. We are familiar with the higher incidence of achlorhydria, and we now realize that impaired carbohydrate tolerance is a pathological manifestation and not a physiological variant. But there are factors which we do not understand and which obviously influence body requirements. Then there are the more practical matters of lack of teeth and inadequate mastication. We are all familiar with the teeth that are kept in the cupboard or in the pocket and not used. There are of course the general physical frailties, arthritis, inadequate ability to move about, dizzy spells that make people frightened to go out shopping or afraid even to move about the house.

Dr Mayon-White mentioned the question of feeding times, with school-children tucking-in in the evening. Many social surveys indicate that old people on the whole dislike having a meal late at night. Studies suggest that in this country half the people over 70 have only one cooked meal a day. They may have a lot of snacks, and most of them prefer and will have if possible a cooked midday meal. Given a free choice, 95 per cent of men have a cooked midday meal, though women are more variable. They have a meal about 8.0—9.0 a.m. although they may have got up as early as 4 or 5 a.m.; they have a midday meal and something in the early evening.

Finally, there is the effect of illness. The British Society for Research on Ageing has been undertaking some investigations into the nutritional requirements of the elderly and, of course, has had to start with people to whom they had easy access. People in welfare homes were used, on the assumption that if they had been there for two years they were representative subjects for their age. They were living in an institution and had no problems relating to the purchase, carrying, and cooking of their food; what they ate should measure up to what they required. Even in institutions like this, under fairly ideal conditions, much variation was found in calorie intake, ranging from as low as 500 to as much as 3,000 Calories a day. Further analysis showed, however, that the women seemed to be taking a little less on the whole than the men, about 2,000 to 2,200 Calories, and also that subjects with a low intake were suffering from some mild infection. There was often a degree of low grade infection concerning which no one took much notice. They had possibly a cold or their bronchitis was a little troublesome, but not sufficient for them to consult their doctor. More interesting still, a group surveyed on three occasions at six-weekly intervals contained two people who had been having as little as 400 or 500 Calories per day but later, when they were better, were found to be taking in nearly 3,000 Calories; in other words, nature was compensating for the deficiency caused by the illness. The most important thing the survey showed was how severely an elderly person (this might also be true of a child) responds to apparently trivial infection in that the nutritional state fails very badly. Given adequate food, this will be compensated, but it requires time and the rate of recuperation is slower than with younger people.

When requirements are studied more specifically, it is found that in most elderly people with supplementary feeding, it takes considerable time to restore the nitrogen balance, and if they are to maintain nitrogen balance over any considerable time, they will require at least one gram of protein per kg. a day, and preferably 1.5 grams; if for any reason intake falls below this level their recovery from illness and return to a proper balance may be long delayed. It is important in the treatment of elderly patients to realize the risks they run of going into negative nitrogen balance which may—I say *may* deliberately—delay their rate of recovery and therefore lead to a spiral of chronic ill health.

When we look at other specific matters, such as iron intake, it is surprising that nearly all the surveys suggest that there is no serious iron deficiency amongst the elderly in this country. Some of you may doubt this, but there is another way of approaching the subject. There have been four very good surveys in general practice of the

significance of anaemia in different parts of the country (one in this area, one in Lancashire, one in the West, and one in East Yorkshire). Quite independently all four came to the same conclusion, that a haemoglobin level below 85 per cent was significant of serious disease. That is to say, the person was suffering from blood loss from the intestinal tract or from haemorrhoids, or had a neoplasm or some other disease. In fact, there was practically no iron-deficiency anaemia in men or women over the age of 65 unless there was a specific cause. The nutritional iron-deficiency anaemia of women had corrected itself by this time.

There is, however, considerable debate as to the significance of blood calcium levels. It has been suggested that osteoporosis in the elderly is entirely a question of calcium deficiency, but this is debatable. Analysis of calcium intake in this country would suggest that the extremes of variation are from 0.25 gram to just under a gram a day. There is the further complication of other substances competing with calcium, so that gross calcium intake in the diet is not necessarily an indication of calcium utilization. We need further knowledge before deciding whether calcium deficiency predisposes to the development of senile osteoporosis.

Vitamin levels in the elderly present a problem on which everyone has views, though it is very difficult to get facts. First of all, there are no reliable or easily applicable methods for estimating vitamin levels. It does not follow that urinary output or blood levels indicate utilization. We can say however that gross vitamin deficiency in this country is not very common, nor is there much evidence of gross malnutrition amongst the healthy elderly. One does find a certain amount of scurvy, and this is partly due to feeding habits, due largely to a disinclination to cook potatoes and dislike for green vegetables. There has been considerable controversy recently on the question of vitamin B₁₂ levels. A chance observation recorded that many people who had mental changes associated with age happened also to have low vitamin B₁₂ blood levels. Further investigation showed that this was true of old people generally, the levels in older people being very much lower than those we accept as normal in middle age. We have tried vitamin supplementation to correct the blood levels and have found no close correlation between the actual level and the mental symptoms. The question is whether this lower level indicates lessened requirements, or is significant of a deficiency state, the classical features of which are not yet recognized.

Finally, I want to stress again what the F.A.O. said in their report for 1956. "Present knowledge of the influence of ageing on the quality of food eaten and energy expenditure is deficient and further investigations are needed."

I hope I have been able to show that healthy people capable of reasonable movement and expenditure of energy, even in their seventies or eighties, provided that they have sufficient money, will normally have a reasonably balanced diet. The things to watch for are diminution in total intake, particularly to below 1750 Calories a day, a level below which the elderly subject is likely to run into deficiency of protein, calcium, and other nutrients, and also the tremendous nutritional impact upon the elderly of infection. There is need, after a trivial infection, to restore the balance by an increased intake of food. I think this is a problem which might be taken up officially with the National Assistance Board. We still do not know what are the optimal nutritional needs of the elderly. Long term studies are needed to answer this question and general practitioners who have access to families might be able to take part in field research to determine the extent to which we can improve the health of old people by ensuring optimal feeding.

DISCUSSION

Question: What is the relation between nutrition and living in institutions?

Prof. Tunbridge: Our attitude to welfare homes has changed very much, because we have gone through a period of limited building. Everyone is agreed that the elderly should be kept in the community and in suitable accommodation as far as possible, but there is the question of providing this accommodation. There are many good schemes involving a certain amount of supervision, and I am afraid that we have to accept the fact that after 70 the decline in mental and physical powers is very obvious in most of us. We do not get about and we find it difficult to do things. These limiting factors and possibly finance are the reasons why many old people have a bad diet. Homes, although not emotionally so satisfying, do provide a certain amount of care. It would be fair to say that elderly people who are fit and retain their senses and their vigour rarely present clinical problems.

Question: Is confusion in the elderly often of nutritional origin?

Prof. Tunbridge: The causes of confusion in the elderly are legion,