

Overnutrition and Cardiovascular Diseases

By T. Strasser

IN THIS "STRANGEST OF ALL POSSIBLE WORLDS" it is not an entirely surprising paradox that ill-health due to overnutrition is in many places an important public health issue, while numerous population groups at the same time suffer from a lack of food. Overnutrition is, and always has been, a reality. The physicians of antiquity associated gout with over-eating, and severe obesity is of course an old phenomenon as well, although some of its endocrine and metabolic mechanisms may be understood better nowadays. Overnutrition impairing the health of the entire population is, however, a relatively recent development, brought about by two new factors that affect many people in technically advanced countries: easy availability of purified, high-calorie food produced by the food industry, and decreasing levels of physical activity due to advances in transportation and machine work. In fact, only in the last two decades has it been recognized that mankind is facing a widespread epidemic of heart and vessel disease in the sense that it affects entire population and that overnutrition is one of the most important contributing factors.

Overnutrition may be defined as food intake exceeding calorie expenditure. It is thus a state of imbalance, resulting in an accumulation of fat in the fat cells, which manifests itself as obesity. There are several ways of assessing obesity (or its opposite leanness). Body weight is not informative enough, unless considered jointly with sex, height, and shape of the body. Obesity can be estimated by measuring the thickness of skin-folds with a simple caliper. More reliable but also more sophisticated methods are measurement of the specific gravity of the body, or measurement with radioactive isotopes.

Obesity is a graded characteris-

tic. Severe obesity is of course easily recognizable, but between a clearly lean and a markedly obese body there are many stages of transition. A person with a mean (median) body weight in one society can be considered as being obese in another social environment. The question of "normality" in biology is a very complicated one. A practical way out is defining the "ideal body weight" as that which is associated with the lowest general mortality, if body-build, age and sex are taken into consideration, although such data may differ in some societies. In affluent societies this "desirable" body weight may be considerably lower than the average values.

Indeed, even slightly or moderately obese persons statistically seem to have higher mortality rates, i.e. shorter life-expectancy, than lean persons from the same age-cohort. Understandably, these relationships have been studied extensively by life-insurance companies. It has been found that, in the United States of America, people who are 10% overweight have an excess mortality of around 10%, not while for those who are 30% overweight excess mortality is also 30-40%. This is not solely due to cardiovascular diseases and diabetes the most frequently associated conditions, for deaths due to pneumonia and influenza, diseases of the digestive system, and even accidents are more common among the obese. Finally, those who had been overweight, but had subsequently reduced, had considerably decreased mortality rates.

Not all cases of obesity are due only to over-eating. Heredity plays an important role, and in some, though relatively rare cases, obesity is due to frank endocrine disease. On the other hand, it is often the case that people are ingesting too much of one of the normal components of a diet, without gross calorie overfeeding. This qualita-

tive imbalance—too much fat is the most important feature of "western" diets—may not lead to marked obesity, and yet greatly increases the risk of heart disease.

Prospective studies during the past two decades on the occurrence of heart disease in entire, initially healthy population groups have identified a number of factors which contribute to the development of atherosclerosis, especially to that of the coronary arteries—those which supply the heart itself with blood. Myocardial infarct and sudden cardiac death are the most important consequences of coronary atherosclerosis.

Obese people are more prone to develop coronary atherosclerosis than those who are lean. However, statistical analyses have shown that obesity itself is not an independent factor of risk; those who are obese and later develop a myocardial infarct or die suddenly of a heart attack usually also have high blood lipid levels and other characteristics, such as elevated blood pressure, or are heavy smokers; while those who are not markedly obese but still get the disease have the same "risk factors", i.e. high blood lipids, high blood pressure, and so on. Obesity thus is a sign of overnutrition, which may lead to heart disease, but heart disease often occurs without significant obesity, though rarely without eating too much fat.

The blood serum contains several kinds of lipids (fatty substances). Cholesterol is the lipid whose relationships with the occurrence of myocardial infarction are best established. A 45-year old man has, for example, a 2.5 greater probability of getting an infarct within the next six years of his life if his blood cholesterol level is as high as 310 mg/dl, than if it is as low as 185 mg/dl¹. The level of serum cholesterol, on the other hand, very much depends on the amount of fats in the diet, to the extent that if the composition and amounts of food someone usually ingests are known, for scientific purposes his serum cholesterol level can be calculated with reasonable accuracy.

In practice, however, the re-
(Contd. on page 118)

Family Health (Contd. f. p. 116)

home gardens or buying them in the market, and consuming them daily. Other people will follow suit if they see the value put on these vegetables by more sophisticated people.

Bountiful breasts

Breast-feeding deserves special mention. In rural areas, it is still the principal way of feeding the infant and is usually continued for 12-25 months. This is highly advantageous because it is cheap, safe and economical; mother's milk is readily available; it confers some immunity against infections; and breast-feeding fosters a warm mother-child relationship. Artificial feeding with bottles is difficult for mother, dangerous for baby, and expensive for father. Bottles easily become contaminated and babies are commonly fed a much diluted pale milky mass of bacteria which produces foretellable results.

It is regrettable that the teaching on nutrition for and by health personnel often concentrates on bottle-feeding. In many large hospitals, breast-feeding is practically eliminated by separating the baby from the mother at birth, and offering the baby artificial feeding too early, before the breast milk comes in (third day). Breast-feeding then never becomes established. Milk manufacturers and retailers often promote this unfortunate trend by offering free milk for the newborn infants even in hospitals. The medical and nursing professions should strongly resist such practices, they are usually indifferent or may even encourage them.

Where possible, and especially in rural areas, breast-feeding should be prolonged for at least 12 months with timely addition of other nutrients. Of course, an adequately fortified diet is necessary to prevent the mother's nutritional state from declining. In urban areas, breast-feeding is being practised less and less, often because the mother needs to start going to work again. Sometimes, however, even the health workers in contact with her do not strongly recommend that she start

or continue breast-feeding. There is now an international league of breast-feeding mothers—La Leche—who are vigorously promoting breast-feeding and trying to prevent its decline round the world.

Action

In order to put some of these ideas on family planning and nutrition into practice, here are some suggestions.

More information is needed in different countries on the links between food, family size and disease, especially in order to provide sound reasons for national action.

Health workers dealing with family planning should concern themselves with nutrition. At the mother and child health centre or the well-baby clinic, food advice should be given, cooking demonstrations can be organized, and protein-rich foods might be distributed.

The mass information media can play a big part in linking better nutrition, family health and family planning in people's minds.

Family planning programmes should incorporate teaching about nutrition.

If you want to know more :
Maternal Nutrition and Family Planning in the Americas (Scientific Publication No. 204). Pan-American Health Organization, Washington 1970.

K.V. Rao and C. Gopalan, *Journal Nutrition & Dietetics*, India, 6 (1969) 258.

The Health Aspects of Food and Nutrition (A manual for developing countries in the Western Pacific Region of WHO). World Health Organization, Manila, 1969.

(WHO)

Overnutrition (Contd. f. p. 117)

verse procedure is used. Physicians take blood samples from individuals supposed to be at high risk of infarction. Chemical analysis of the sample shows whether the cholesterol level is high, and if the suspicion is confirmed advice is given to alter the diet, to make it more balanced and less rich in fats and calories. Briefly, overnutrition is banned.

Myocardial infarct and sudden death are not the only cardiovas-

cular conditions associated with overnutrition. High blood pressure occurs more frequently in people who over-eat. Elevated blood pressure itself contributes to coronary atherosclerosis and considerably enhances the risk of stroke. Similarly, overeating contributes to diabetes, which itself is another danger to the blood vessels, particularly to those of the heart and the brain.

In extreme obesity there are other complications. It imposes an increased workload on the heart, leading also to hypertrophy of the left ventricle. Because obese people get easily tired, they move less and less and further decrease their energy expenditure. However, as they continue to over-eat, in accordance with deeply rooted habits, their obesity may become a self-perpetuating, progressive, incapacitating condition.

Cases of incapacitating obesity are rare, but overnutrition leading to heart and vessel disease is, in wealthy societies, an extremely common phenomenon, almost one of the fundamental biosocial characteristics of many groups. Why do people, if they can afford it, so often eat more than they need? There are many reasons for such behaviour—social, historical and psychological ones. What matters is the fact that overnutrition is largely a behavioural disorder and thus, in principle, could be corrected relatively easily.

In practice, however, there are many obstacles, education early in childhood being one of them. A fat child is likely to become a fat adult. Deeply implanted habits of over-eating may become a lifelong handicap and can shorten a person's life. It is extremely important to educate children early to acquire healthy, well-balanced eating habits, if a change is to be induced in society's attitude and behaviour toward overnutrition.

(WHO)

1. Based on data from a United States of America study. In other countries the actual figures may be different, though in the same order of magnitude.