Invited editorial

Clinical nutrition in Hong Kong

Sophie S.F. Leung

Senior Lecturer in Paediatrics, The Chinese University of Hong Kong, Shatin, Hong Kong.

Hong Kong has undergone dramatic socio-economic changes over the last three decades. The general improvement in health care can be reflected in the remarkable drop in the infant mortality rate: 37.7 per 100 000 in 1961 to 6.9 per 100 000 in 1989. However, the mortality rate for acute myocardial infarction has increased from 10 to 31 per 100 000 and cancer from 110 to 149 per 100 000 between 1974 and 1989[1]. The extent to which changes in dietary practice have contributed may be revealed from studies performed over the last few years.

There was an increase in the availability of a large variety of food in the East and West. An increase in prosperity and purchasing power of families, smaller family size and more attractive advertising on new food items have all contributed to a trend of eating more animal protein, animal fat and refined sugar, which was typical of affluent societies.

Childhood and adolescent obesity began to emerge with a prevalence of 5%[2,3]. It was usually associated with overeating at the age of 5/6 years when they put on weight and subcutaneous fat rapidly. Food items that these children consumed in excess included meat, chicken, sausages, instant noodles, chips and crisps, ice-cream, soft drinks, cakes, chocolates and sweets. They had higher serum triglycerides, lower high density cholesterol than the non-obese individuals and a one in three chance of having impaired glucose tolerance[4] The age-adjusted rate of non-insulin-dependent diabetes mellitus was 7.7%, which is in marked contrast to the low prevalence rate among the Chinese living in Mainland China[5].

A majority of babies were bottle fed with infant formulas (70% at birth, 88% at 2 months)[6]. While bottle feeding might have contributed to the occurrence of allergic and diarrhoeal disease in infancy, it has not contributed to protein–energy malnutrition or iron-deficiency anaemia as these latter two conditions were extremely rare in infants. Infant formula or milk was given to children throughout the preschool years. Protein intake was high, at around four times that of the recommended safe level of protein intake. During the weaning period, protein-rich foods were fish, meat, eggs and milk. By the age of seven, these became meat and milk. Protein intake contributed 20% of the total daily energy intake from one year of age to adolescence. In adults, the protein intake would be expected to be even higher as they were more involved in social occasions which were associated with a high consumption of animal fat and protein but little rice and vegetables. Fat intake contributed to 50% of the total daily energy intake at birth, but fell to 30% after 12 months and remained there until adolescence. Although 30% fat was the recommended intake in many affluent societies to reduce the risk of coronary heart disease, it appeared to be an unnecessarily high intake for Hong Kong Chinese. The mean (SD) serum total cholesterol of the 7-year-old children was 4.59 (0.83) mmol/L, which was much higher than that of children of the same age in America, UK and Europe[2]. Compared to affluent western societies, the polyunsaturated to saturated fatty acid (PS) ratio of the total fat intake was not lower, but the cholesterol intake was high at 366–481 mg and fibre intake was low at 3.2–4 gm both in children and adolescence. It is worth noting that for many generations the traditional Chinese diet had been low in fat: 18% high in carbohydrate, mostly complex: 70% and high in fibre: 33 gm/day. The rapid change in diet has taken place only in the last two decades[7].

The extra 50% increase in fat consumption by children and adolescents came mainly from meat (fatty chicken with skin, sausages, ham, pork, beef), dairy products (milk, cream) and oily foods (fast food, restaurant foods and snacks). Dairy products were regularly consumed by one-third of adolescents and adults. In the age range of 30–39 years, the total serum cholesterol level was 5.55 (0.11) mmol/L for men and 4.97 (0.09) mmol/L for women and these levels were close to those of the Americans[8]. The elderly (60–69 years) who were living and sharing meals with their younger generation had a much higher serum total cholesterol level than those who were living in sheltered house provided by the social welfare department and their diet was more traditional with 20% of energy derived from fat[9,10]: 5.87 (0.16) mmol/L versus 5.38 (1.14) mmol/L for men and 6.45 (0.13) mmol/L versus 5.3 (0.91) mmol/L for women.

The study of lifestyle and coronary risk in the present Mainland Southern Chinese has also provided an insight of what it was like in Hong Kong (HK) two to three decades ago. Children in Jiangmen (JM), a city in Guangdong Province sharing the same ethnicity and

same body fatness as children in HK indeed had a significantly lower serum cholesterol (TC) level: 4.16 (0.61) mmol/L[11]. They had a much lower total fat intake: 35 gm versus 48 gm and a much higher PS ratio 0.81 versus 0.69, the C 18–2/C14–0 ratio was double in JM.

Similarly, mothers of the JM children also had a significantly lower TC while they had a similar body mass index to those in HK[12]. Apart from dietary differences, the level of physical activity was different. Hong Kong people led a much more sedentary lifestyle: living in high-rise flats with lifts and limited living space, children going to school on school buses, with only two physical education lessons per week at school. Both children and mothers had very little recreational sports. In Jiangmen, people lived in six-storey buildings with no lifts and flats were more spacious, children walked to school both in the morning and afternoon and performed daily body exercise for 15 minutes. All women walked or cycled to work, both in the morning and afternoon sessions.

The more active lifestyle in Mainland China might also explain the same bone mineral density achieved by adult women with a mean age of 35 years in JM and HK, in spite of a much lower habitual calcium intake in the former. One of the main features of a traditional Chinese diet had been a low dairy consumption, therefore the calcium intake was much lower than that of the Caucasians. Adaptation to low calcium intake was shown by a higher true calcium absorption of 7-year-old children using double-labelled stable calcium isotope: 63(11)% in those with mean calcium intake of 300 mg/day and 55(7.3%) in those with mean calcium intake of 884 mg/day[13]. These values were much higher than the reported calcium absorption of 35% in the Caucasian. The incidence of hip fracture among the Chinese was only one-tenth of the incidence in Americans, in spite of the much lower calcium intake. This could have been due to a higher absorption rate of calcium, more physical activity, better stability and less 'accidents'. A three-fold increase in hip fracture has been noticed in Hong Kong over the last two decades, due to both a decrease in calcium intake and decrease in physical activity[14]. Traditional foods that are rich in calcium like bean curd, small fish with bones, small dried shrimps, bones of big fish and poultry and green vegetables, made soft by long hours of cooking, sesame, etc. were less frequently consumed and have been replaced by flesh and meat of big fish, chicken and pork. Being a subtropical area, sunshine is plentiful in Hong Kong and populations of all ages, except those who were institutionalized, had an adequate serum vitamin D level[5,15].

The crude death rate from cerebrovascular disease, in contrary to coronary heart disease, fell from 67 to 52 per 100 000 between 1980 and 1989. Indeed, the mean (SD) blood pressure of Hong Kong adult women was lower than that of JM: 90.4 (0.84) mmHg versus 96.4 (9.9) mmHg. A significant difference was also observed in their children: 80.5 (6.5) mmHg in HK versus 85.6 (7.2) mmHg in JM. Meals in JM tasted more salty than those in Hong Kong. Drinking milk was not common in JM after a child's first year. The habitual lower intake of sodium and higher intake of calcium in Hong Kong might have contributed to the lower blood pressure in HK population and the reduced risk of death by stroke. However, within the Hong Kong population, the relationship between the current intake of these two nutrients and blood pressure was not observed to be strong[16]. An improved intra-uterine nutrition might have played an important role in priming a lower blood pressure attained in childhood and adulthood[17].

Bronchogenic carcinoma was the commonest cancer in Hong Kong. A low intake of β-carotene as well as cigarette smoking were shown to be risk factors[18]. The general decrease in consumption of green vegetables (replaced by meat) led to a decrease in intake of β-carotene, fibre and an increase in animal protein and animal fat, predisposing the younger generation to a greater risk of colorectal cancer and breast cancer[19,20].

There was no observed benefit from increasing dietary fat from 20% to 30% of total daily energy intake by decreasing dietary fibre and complex carbohydrate. On the contrary, there were warnings of the rapid emergence of coronary heart disease and cancer. Efforts should be made to promote a healthier lifestyle. Obviously, the present amount of fat intake for adults and children of more than 2 years of age: 30% of total daily energy was already too much. Recommendation to lower it to 20–25% is required with PS ratio of 1. An increase in carbohydrate, mainly complex carbohydrate to 60% of daily energy intake is appropriate. Fibre intake should be increased to 30 gm for adults and probably 15 gm for children. Cholesterol intake should be less than 300 mg and salt intake 5–10 gm. Like Japan, Singapore and Mainland China, eating more vegetables, beans and fish should be encouraged[7,21]. Milk can be considered one of the foods rich in protein, along with poultry, meat, eggs and perhaps beans, rather than an indispensable separate food group like in most western countries. More physical activity, in the form of walking, climbing stairs, body exercise and Tai chi which are not so demanding for space and facilities should be encouraged in addition to recreational ball games and field and water sports.

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