Nutrient Intake and Food Habit of a Group of Urban Elderly People of Bangladesh

Ferdousi Yasmeen[1] and Badrun Nahar[2]*

Dept. of Nutrition and Bichemistry, NIPSOM, Dhaka[1]
Institute of Nutrition and Food Science, University of Dhaka, Dhaka-1000[2]

Abstract

A cross sectional study was carried out to investigate nutrient intake and food habit of a group of urban elderly in Bangladesh. The sample is consisted of 209 males and 206 females, aged 60+ to 80 years. The dietary intake was estimated using 24-hour recall method. The habitual pattern of food intake was examined using a 7-day food frequency questionnaire. The adequacy of the different nutrient intake was determined in comparison with recommended dietary allowances (RDA). Mean intakes of energy, protein, zinc, riboflavin and vitamin A were found below RDA in both sexes. About half of the participants failed to meet 50% of RDA for zinc, riboflavin and vitamin A, while the intake of fat, calcium, iron and vitamin C were above RDA. One third of the males (37%) and the females (35%) failed to meet 50% of RDA for vitamin C. A large portion of the males and females consumed pulses, green leafy vegetables regularly, but the consumption of pulses was only 25g/d and intake of green leafy vegetables (GLV) was 13g and 21g/d in males and females respectively. One-third of the participants drank milk regularly. Fish was more commonly eaten than meat. The present study suggests that the elderly people are at risk for poor nutritional status. A large scale national nutrition survey of the elderly is necessary.

Key wards: Elderly, Nutrient, Food habit, RDA

Introduction

Aging refers to normal progressive and irreversible biological change that occurs over the individual life span. Aging is accompanied by a variety of physiological, psychological, economic and social changes that may compromise the nutritional status of the elderly people. Physiological, social and emotional problems may interfere with appetite. The absorption of nutrients also decrease due to aging process in the gut. Thus, they are likely to become more vulnerable to nutritional disorders resulting in higher morbidity and mortality. Epidemiological studies on the elderly

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* Author for correspondence

indicate that good nutritional status is an important determinant of quality of life and there is wide acceptance that good nutrition is an insurance against prevalence of many degenerative diseases among the elderly[1].

Very little information is available on nutrient intake and food habits of the elderly in Bangladesh. In Bangladesh National Nutrition Survey-1995[2] only sixty elderly people were included as members of the surveyed family. To date no one has investigated nutrient intake and dietary pattern of elderly in Bangladesh as a specific group. The assessment of the nutrient intake is prerequisite for developing appropriate strategies and programme for maintaining, protecting and enhancing the health and quality of life of the elderly. The dietary information is particularly required as this is the most important factor in the nutritional sense that can be modified and improved. Therefore, in this study an attempt has been made to assess the nutrient intake and food habit of a group of elderly people attending a geriatric centre in Dhaka, Bangladesh.

Materials and methods
Study population

Male and female elderly attending geriatric centre in Dhaka, Bangladesh, were the study population. For the purpose of the study, a person aged 60 and above was defined as elderly. All the elderly persons attending the centre were invited to participate in the study. Those who had been living in Dhaka city for at least five years, and were able to answer the questions independently and physically able to stand (in upright position) without any support were included in the study. The purpose of the study was explained to each of them and after getting their consent they were recruited into the study. A total of 415 elderly persons participated in the study of whome 209 were males and 206 females.

Study period

Information was collected during every working day except Sturday from January to August, 1999.

Development of questionnaire

A questionnaire was developed to obtain relevant information on the socio-economic conditions, food habit and 24-hour dietary intake. The questionnaire was pre tested and modified on the basis of the test result before its use.

Dietary information

Food consumption was assessed with the 24-hour dietary recall method. The participants were shown various standardized utensils such as serving plates, cups spoons and models of different foods to get the nearest possible approximation of serving sizes of the cooked food consumed. The serving weight of different food items was calculated from this information. A 7-day food frequency questionnaire on selected food items was used to obtain information on the habitual dietary pattern of each participant. Equivalent raw food weight was obtained by using a conversion table for Bangladeshi foods developed at the Institute of Nutrition and Food Science (INFS), University of Dhaka[3]. A programme package, based on Bangladeshi and Indian food composition table[4,5] developed at the INFS, was used to calculate the intake of nutrients from raw weight of food. The adequacy of the intake of different nutrients was determined with reference to RDA for each nutrient. Energy requirement was calculated by multiplying BMR with a factor 1.51 which was recommended for the elderly population[6]. A statistical package for the social science (SPSS/PC) was used for the analysis of the results[7].

Results

Particulars of the 415 elderly is given in Table 1. Sixty eight percent of the male participants were over 64 years whereas majority of the females (52%) were in the 60-64 years age group. The majority of the males (91%) were married, while 58% females were widows. About 51% of the females and 27% of the males were illiterate. Majority of the participants, both male (32%) and female (39%), came from families with per capita monthly income between Tk 1000-1999. Table 2 shows consumption pattern of selected food items by participants obtained from a 7-day intake frequency. A large percentage of the males (68%) and the females (66%) took legumes/pulses, and 77% males and 82% females consumed green leafy vegetables regularly. Nearly 70% of the participants took 3 times or less, and only 15% took fish regularly. A large number (70%) of the participants did not take meat at all in the week preceding the interview. About one-third of the participants drank milk regularly. Table 3 and 4 indicate that mean energy & protein intakes were below RDA for both sexes. Despite this low energy intake, fat was adequate in the diet of the study population. Of the micronutrients, mean intakes of zinc, vitamin A and riboflavin were far below RDA. None of the participants could meet the RDA for zinc and over whelming majority of the male (67%) and female (54%) consumed less than 50% of RDA. Abot 52% and 45% of the participants consumed less than 50% of

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RDA for vitamin A and riboflavin respectively. The mean intake of iron, calcium and vitamin C were adequate, but a substantial portion of males (37%) and females (35%) failed to meet the RDA for vitamin C. The mean consumption of different foods is shown in Table 5. It reveals that intakes of cereals, roots and tubers are almost similar in both males and females. The elderly males consumed more meat, egg and milk than females. On the other hand elderly females consumed more GLV and fruits than their male counterparts.

Discussion

In the present study the results of nutrient intake and food habit of a group of urban elderly are presented. The study has clearly revealed that the nutrient intake of the elderly population is not much different from that observed in the population of Bangladesh[2]. The nutrient requirement for the elederly is not precisely defined. In general, energy needs decreases with age, althought their needs for protein, calcium, zinc, B vitamins and other nutrients either remain the same or increased. With diminishing food intake resulting from less demand for energy, it becomes difficult to meet RDA for many nutrients.

It has been suggested that dietary intakes that fail to meet even 50% of RDA for a particular nutrient do not necessarily mean that the individuals are at the risk of developing a nutritional deficiency. However, it is believed that the risk increased substantially if the one-fourth of a population is found to have dietary intakes that are less than 50% of RDA for a particular nutrient[8]. In our study dietary intake of zinc (67%), vitamin A (54%), vitamin C (37%) and riboflavin (43%) fell into this category (Table 3 and 4).

The low intakes of vitamin A vitamin C and riboflavin found in the present study are in agreement with the other studies reported in Bangladesh[2,9]. The intakes of vitamin A and C are greatly influenced by specific food choice of the participants. Indequate consumption of fruits and green leafy vegetables, which are rich sources of vitamin A and C, is responsible for this low intake. Similarly, inadequate consumption of milk is the reason for the low riboflavin intake. It may be mentioned that riboflavin intake has been linked to at least one chronic non communicable disease – esophageal cancer[10]. Although the incidence of esophageal cancer among Bangladeshi people is not known, findings from other studies indicated that meeting the riboflavin requirement is a important factor to reduce the burden of this chronic disease[10]

Nearly 70% of the elderly took legumes regularly (Table 2). Legume proteins are good source of lysin. Legume has also cholesterol-lowering effect[11] and it is known to prevent cancer[12]. Legumes are also rich in folic acid which has protective effect on heart disease[13]. Increased intake of legume is therefore beneficial to health. Dietary pattern also revealed that nearly 75% of the elderly did not take meat and only about 15% consumed fish regularly. Probably due to the poor dentures the elderly people find meat hard to eat and because of poor eye sight they avoid fish for bones Presence of milk in the diet of elderly people indicate the attitude of our society to the elderly. As they find difficult to eat solid food they get supply of liquid food, which could be easily consumed and as well as it is the ideal food for all ages. This reflects the caring attitude of our society for the elderly people.

The participants, both male and female elderly, have consumed iron more than RDA (Table 3, 4). Several recent studies also reported higher intake of iron by the elderly, which exceed the RDA (10 mg/d), body iron store may increases due to this higher intake[14]. It has been known that excess iron act as pro-oxidant, increasing free radical damage to tissues and increasing the risk of heart diseases. So, research is necessary on iron nutrition of the elderly.

Several studies throughout the world reported lower intake of zinc (7-9 mg/d) by the elderly people[14]. The finding of the present study is similar to those reports. None of the participants could meet the RDA for zinc and 52% consumed less than 50% of RDA (Table 3, 4). Diet rich in phytate and fibre decrease zinc absorption. This is an important issue, lower intake of zinc and decreased absorption may aggravate the zinc nutrition in the elderly. In the present study major portion of the zinc was provided by the cereals, which are rich in both phytate and fibres. So, the information found in the present study points to the need for further study as to whether current zinc intakes in the elderly are adequate.

Some evidence suggests that high serum levels of antioxidant vitamins E, C and carotenoids reduce the risk of age-related diseases like cataract, cancer and Alzheimers[15]. More information is necessary about the intake of these vitamins by the elderly in the developing countries, where deficiency is likely to be common.

For the first time this study has provided information on the nutrient intake of the elderly in Bangladesh. The study has indentified the dietary deficiencies prevailing in the elderly of Bangladesh The information provided in this study may be useful as reference and may also be used as a basis for developing a programme for nutritional care of the elderly in the country.

Table 1 : Particulars of the participants

Variables	Male (n=209		Female (n=206)	
	No.	%	No.	%
Age (yrs)				
60-64	68	33	108	52
65-69	58	28	40	19
70+	83	40	58	28
Marital status				
Married	190	91	87	42
Widow/Widower	19	9	119	58
Educational level				
Illiterate	57	27	106	51
Primary	45	22	66	32
SSC and HSC	50	24	26	13
Graduate and above	57	27	8	4
Per capita income				
(Taka per month)				
<1000	46	22	39	19
1000-1999	67	32	80	39
2000-2999	47	23	41	20
3000+	49	23	46	22

Table 2 : Precent distribution of the participants by consumption frequencise of selected food items

Food items	Consumption Frequency (Times/week)					
	0		1-3		7 or more	
	M	F	M	F	M	F
Milk	39.7	43.2	26	25.7	34.9	31.1
Eggs	36.9	48	48.3	43.7	14.8	8.3
Meat	71.4	72.3	25.4	24.9	3.2	2.9
Fish	14.1	15.7	70.3	69.6	15.5	14.3
Legumes	5.2	6.8	26.8	27.2	68	66
Green leafy egetables	5.3	3	18.2	15	76.5	82
Fruits	24.4	29.6	56	53.4	19.6	17

Table 3 : Daily mean intake of nutrients by the elderly male in relation to RDA

Nutrients	Male (n=209)			
	Mean ± SD	Meeting % of RDA	RDA	% of the participants receiving <50% of RDA
Energy (Kcal)	1598±272	85.4	1872[a]	0
Protein (g)	47.5±12.9	85	56[b]	1
Fat (g)	35.4±12.4	113	31[c]	1
Calcium (mg)	470±279	118	400[d]	20
Iron (mg)	13.7+7.1	125	10[e]	9
Zinc (mg)	6.8+1.8	45	15[e]	67
Vitamin A (mcg)	561±602	79	750[d]	54
Roboflavin (mg)	0.7±0.3	60	1.12[e]	43
Vitamin C (mg)	30.9±29.5	105	30[d]	37

Sources of RDA :

a.   FAO/WHO/UNU[6]
b.   Based on 1g/kg body weight[16]
c.   15% of energy requirement[17]
d.   Hand book on human nutritional requirement[18]
e.   National Research Council[19]

Table 4 : Daily mean intake of nutrients by the elderly female in relation to RDA

Nutrients	Female (n=206)			
	Mean ± SD	Meeting % of RDA	RDA	% of the participants receiving <50% of RDA
Energy (Kcal)	1493±249	92	1630[a]	1
Protein (g)	40.6±10.4	84	48[b]	1
Fat (g)	33.8±11.8	126	27[c]	1
Calcium (mg)	404±258	101	400[d]	22
Iron (mg)	12.6+7.4	140	10[e]	15
Zinc (mg)	6.0+1.5	50	12[e]	54
Vitamin A (mcg)	695±792	93	750[d]	51
Roboflavin (mg)	0.6±0.3	58	0.98[e]	46
Vitamin C (mg)	31.4±31.1	105	30[d]	35

Sources of RDA :

a.   FAO/WHO/UNU[6]
b.   Based on 1g/kg body weight[16]
c.   15% of energy requirement[17]
d.   Hand book on human nutritional requirement[18]
e.   National Research Council[19]

Table 5 : Intakes (g/d) of different foods by the participants

Food group	Male (n=209		Femel (n=206)	
	Mean (g)	± SD	Mean (g)	± SD
Cereal	288	67	271	67
Roots and tubers	25	35	23	30
Pulses and nuts	25	23	25	23
Vegetables :				
Green leafy	13	25	21	33
Yellow	38	42	31	39
Others	14	29	11	25
Fruits	27	67	32	79
Milk and Milk products	79	108	66	98
Eggs	13	24	9	18
Meat	21	34	15	25
Fish	34	31	28	27
Sugar	8	11	6	9
Fats and oils	24	8	24	9

References

1. Rosenburgh IH, Miller J. Nutritional factors in physical and cognitive functions of elderly people. Am.j.Clin. Nutr. 1992; 55: 1237s-43s.

2. Jahan K, Hossain M. Nature and extent of malnutrition in Bangladesh. Bangladesh National Nutrition Survey 1995-96. Dhaka; Bangladesh: University of Dhaka, 1998.

3. Ali SMK, Pramanik MMA. Conversion factors and dietary calculations. Institute of Nutrition and Food Science, Dhaka, Bangladesh: University of Dhaka, 1991.

4. INFS. Deshia Khadyadrabyer Pushtiman (Nutritive value of Indigenous Food Stuffs). Dhaka, Bangladesh: University of Dhaka, 1992.

5. Gopalan C, Ramasastri BV, Balasubramanian SC. Nutritive Value of Indian Foods. National Institute of Nutrition, Hydrabad, India: Indian Council of Medical Research, 1993.

6. FAO/WHO/UNU. Energy and protein requirements. WHO Technical Report series, no. 724. Geneva: WHO, 1985.

7. Statistical package for social sciences. SPSS/PC version 9.0. Chicago, IL: SPSS Inc., 1990.

8. Philip JG, Jams SG, William CH, Elizabeth M, Hooper RN and Andrea GL, Nutritional status in a healthy elderly population; dietary and supplemental intakes. Am. J. Clin. Nutr. 1982; 36:319-331.

9. Institute of Nutrition and Food Science. Nutrition Survey of Rural Bangladesh (1981-82). Dhaka, Bangladesh: University of Dhaka, 1983.

10. Russel RM. Nutrient based Dietary guidelines for older people. SCN News no 19, 1999; 21-23.

11. Kestin M, Rouse I, Correll R, Nestel P. Cardiovascular disease factors in free living men: comparison of two pruden diet one based on lactoovovegetarianism and the other allows meat. Am. J. Clin. Nutr. 1998; 50:280-287.

12. Ireland P, Giles G.A review of diet and cancer: What are the prospects for prevention in Australia? Cancer Forum. 1993; 17:132-187.

13. Katherine T. B vitamins, Homocysteine, Heart disease and Cognitive function. SCN News No. 19 December 1999; 30-33.

14. Wood Jr, Suter MP and Russel MR, Mineral requirement of elderly people. Am J Clin Nutr. 1995; 62:493-505.

15. Shuman JM. Nutrition in Aging. In: Mahan KI and Sylvia ES, eds. Krauses Food, Nutrition, and Diet Therapy. 9th ed. Philadelphia: WB Saunders company. 1996:287-308.

16. Campbel WW, Crim CM, Dallal EG, Young RV and Evan WJ. Increased protein requirements in elderly people: new data and retrospective reassessments. Am.J.Clin. Nutr. 1994; 60:501-509.

17. World Health Organization. Diet, Nutrition and Prevention of Chronic Diseases. Report series 797. Geneva: WHO, 1990.

18. World Health Organization. Handbook on human nutritional requirements, Geneva: WHO, 1974.

19. National Research Council. Recommended dietary allowances, 10th ed. National Academy Press. Washington D.C.