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RESEARCH ARTICLE

PREVALENCE OF ANAEMIA AMONG SELECTED ELDERLY

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ABSTRACT

Present study was conducted to assess the prevalence of anaemia among 600 elderly population residing in urban (200), rural (200) and tribal area (200) of Nanded district of Marathwada region of Maharashtra state, India. Daily food intake of each selected elderly was recorded with the help of two days dietary recall method and weighment method. By using food consumption table of ICMR (Gopalan et al., 2004) the nutrient intake of the elderly was calculated. To find out the percent adequacy in consumption food intake was compared with balanced diet and nutrient intake was compared with the ICMR recommended dietary allowances (ICMR 2012). To judge the extent of prevalence of anemia among elderly, haemoglobin content was determined by Cyanomethyloglobin method (Crossby et al., 1954). Based on the determined values of haemoglobin content were classified into four groups (ICH, 1986 and NCCS, 1994), as normal (>12 g Hb/dl of blood), mild (>10 -12 g Hb/dl of blood), moderate (7-10 g Hb/dl of blood) and sever (<7 g Hb/dl of blood) anaemia. Result of the study revealed that, calculated percent adequacy of cereals, pulses, green leafy vegetables, roots and tubers, other vegetables, fruits, fats and oil, milk and milk products and sugar and jaggery was 97.88, 74.84, 54.85, 48.05, 20.08, 15.39, 62.96, 34.79 and 83.3 percent respectively. Elderly belonging to high income group had more percent adequacy of all nutrients i.e. fat (136.77 %), phosphorus (115.01 %), vitamin c (91.67 %), energy (74.80 %), protein (73.55 %), carbohydrate (66.25 %), calcium (52.71 %) and iron (50.47 %). The haemoglobin content of elderly male (9.86 ± 0.62) was found to be more than elderly female (8.12 ± 0.58) with statistically significant difference. The equal percent of urban (22.50 %) and rural (25 %) elderly were suffering with mild and moderate grade of anaemia.

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INTRODUCTION

The term elderly, in general, applies to people aged between 65 and above. Aging is the process of growing old chronologically. Good nutrition is important at every stage of life for maintaining good health and personal productivity and it is especially important to the elderly because of the physiological changes that occur in the body as people age. Even in the best of circumstances, aging weakens the immune system. Insufficient calories, lack of protein and micronutrient deficiencies in the elderly further weaken their immunity and expose them to infection that may reduce absorption of essential nutrients, thereby compounding the cycle of undernutrition and infection (Today's research on aging, 2007). Important nutrients like calories, protein, micro nutrients like calcium, phosphorus and iron play very important role for healthy old age. Deficiency of iron, protein and vitamin c may lead to decrease in haemoglobin level in blood and thereby become cause for anemia in old age.

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Anemia in the elderly (defined as people aged > 65 years) is common and increasing as the population ages. In older patients, anemia of any degree contributes significantly to morbidity and mortality and has a significant effect on the quality of life. Despite its clinical importance, anemia in the elderly is under-recognized and evidence-based guidelines on its management are lacking (Stauder and Thein, 2014). The functional capacity and health of the elderly depend to a greater extent on their nutritional status and food security. It is also evident from the available literature that average diet and nutrient intake of elderly were found to be deficient as compared to recommended daily allowances suggested for elderly. Diet plays an important role in the aging process. By considering the above facts, present study was conducted to assess the percent adequacy of food and nutrients and to know the prevalence of anemia among elderly people in Nanded District of Marathwada region.

MATERIALS AND METHODS

Present investigation was conducted to assess prevalence of anaemia among selected elderly population having different socio economic background residing in Nanded district of

Marathwada region of Maharashtra state, India. Random sampling technique was used for selection of samples and 200 each were selected from urban, rural and tribal areas. Food intake was assessed by two day recall method and weighment method. By using food consumption table of ICMR (Gopalan et al., 2004) the nutrient intake of the elderly was calculated. To find out the percent adequacy food and nutrient intake of the elderly was compared with the balanced diet and recommended dietary allowances (ICMR 2012). To judge the extent of prevalence of anemia among elderly, blood sample was taken from 10 percent rural and urban elderly by given finger prick. Haemoglobin content from the collected blood sample was determined by Cyanomethyloglobin method (Crossby et al., 1954). Based on the determined values of haemoglobin content in the blood of elderly they were classified into four groups (ICHS, 1986 and NCCS, 1994), as normal (>12 g Hb/dl of blood), and those having mild (>10 - 12 g Hb/dl of blood), moderate (7 - 10 g Hb/dl of blood) and severe (<7 g Hb/dl of blood) anaemia.

RESULTS

Percent adequacy of food intake by the selected elderly from different socio economic status is presented in Table 1. It is evident from the table that, calculated percent adequacy of cereals, pulses, green leafy vegetables, roots and tubers, other vegetables, fruits, fats and oil, milk and milk products and sugar and jaggery was 97.88, 74.84, 54.85, 48.05, 20.08, 15.39, 62.96, 34.79 and 83.3 percent respectively. Except fruits and sugar and jaggery, percent adequacy of all other food groups was found more among urban elderly. While lower percent adequacy was noted among tribal elderly as compared to other two areas i.e. urban and rural. Whereas, percent adequacy of various food stuffs by elderly male ranged from 12.46 (other vegetables) to 93.21 (cereals) and by elderly female ranged from 9.51 (other vegetable) to 78.04 (sugar and jaggery). Age wise percent adequacy of various food stuffs noted that, percent adequacy of all food stuffs was more among elderly of 60 to 70 years with range of 11.47 (other vegetable) to 86.39 (cereals). While the range was 9.87 (other vegetable) to 78.94 (sugar and jaggery) among elderly of >70 years. As per food habits, when percent adequacy was studied, it was observed that, except pulses and sugar and jaggery all other food stuffs was found to be consumed more by vegetarian elderly than non vegetarian elderly. Further it is observed from the table that, income of the family influences on the percent adequacy of various food intake. Except pulses and sugar and jaggery, percent adequacy of all other food stuffs was noted more among elderly of high income group. Percent adequacy of cereals (95.34 %), green leafy vegetables (54.07 %), roots and tubers (18.33 %), other vegetables (47.09 %), fats and oil (69.2 %), milk and milk products (61.77 %) was found more among elderly of high income group. While percent adequacy of pulses (68.34 %) and sugar and jaggery (82.28 %) was more among elderly of low income group. Only percent adequacy of fruits (16.73 %) was found more among elderly of middle income group. However, occupation of elderly also affected on percent adequacy of food intake. Intake of cereals, green leafy vegetables, milk and milk products were found to be more by elderly retired as government servant. While, percent adequacy of roots and tubers and fruits were reported maximum by elderly doing private job. Contrary, except sugar and jaggery, percent adequacy for all other food stuffs was found to be less by elderly doing farmers.

Percent adequacy of nutrient intake of selected elderly from different socio economic categories is described in Table 2. It is evident from the table that, percent adequacy of intake of protein, carbohydrate, fat, energy, iron, calcium, phosphorus and vitamin c was found to be more among elderly residing in urban area (i.e. 77.57, 142.52, 68.61, 77.71, 52.41, 55.11, 120.52 and 64.90 percent respectively). Followed by rural elderly i.e. 57.95, 102.02, 56.39, 61.53, 42.16, 38.69, 91.90 and 64.90 % respectively. Lowest percent adequacy of nutrient intake was noted among tribal elderly. When compared among elderly of two age groups, elderly of 60 to 70 years of age recorded 36.23 percent (calcium) to 102.38 percent (fat) adequacy. However, when compared between two genders, percent adequacy of fat (101.47 %), phosphorus (99.27 %), vitamin c (63.24 %), iron (44.10 %) and calcium (38.49 %), was more among elderly male. While, percent adequacy for protein (63.17 %), energy (62.19 %) and carbohydrate (60.53 %), was more among elderly female. However, as per food habits, percent adequacy for all nutrient intake was found to be more among vegetarian elderly than non vegetarian elderly. As income of family increased, percent adequacy of various nutrient intake also increased. When observed critically, elderly belonging to high income group had more percent adequacy of all nutrients i.e. fat (136.77 %), phosphorus (115.01 %), vitamin c (91.67 %), energy (74.80 %), protein (73.55 %), carbohydrate (66.25 %), calcium (52.71 %) and iron (50.47 %) followed by middle income group i.e. 88.30, 85.98, 57.53, 54.72, 53.41, 48.60, 40.36 and 32.18 percent respectively. While very low percent adequacy was noted among elderly of low income group. However, occupation of elderly also affected on percent adequacy of nutrient intake. Percent adequacy for protein, fat, energy, iron, calcium, phosphorus and vitamin c was found more among elderly retired as government servant as compared to other criterion. Whereas, percent adequacy for all nutrient was noted very low by elderly who were belonging to farming community.

Table 3 presents the data on haemoglobin content of blood among selected elderly subjects. For this estimation of blood haemoglobin, 10 percent each elderly were selected from urban (20) and rural (20) area only. It is evident from the table that, haemoglobin content of elderly from urban and rural was 9.09 ± 1.07 and 8.81 ± 1.05 . though the difference was noted among two areas it was found to be non significant. Further, the haemoglobin content of elderly of two age groups was noted, non significant difference was observed with more haemoglobin content among elderly of 60 to 70 years (9.04 ± 1.07) than elderly of >70 years (8.43 ± 1.01). The haemoglobin content of elderly male (9.86 ± 0.62) was found to be more than elderly female (8.12 ± 0.58) with statistically significant difference. Contrary, when occupation of elderly was considered, though the difference was noted for haemoglobin values among all occupations, but values were non significant. Further it is reported from the table that, income of the family shows impact on haemoglobin values. Comparatively, elderly from low income group shows significantly low haemoglobin content (7.90 ± 0.00) than elderly from high income group (9.08 ± 0.96). vegetarian elderly shows more haemoglobin values (8.99 ± 1.02) than non vegetarian elderly (8.82 ± 1.23) but difference was non significant. Prevalence of anaemia in selected elderly subjects belonging to different socio economic groups is presented in Table 4. Thus 40 elderly each from urban (20) and rural (20) area (10 %) were selected for the screening of anaemia on the basis of haemoglobin content of blood.

Table 1. Percent adequacy of food intake by the selected elderly from different socio economic status

Socio economic factors	Food groups								
	Cereals	Pulses	Green leafy Vegetables	Roots and tubers	Other vegetables	Fruits	Fats & oil	Milk and milk products	Sugar and jaggery
Area									
Urban (200)	97.88	74.84	54.85	48.05	20.08	15.39	62.96	34.79	83.3
Rural(200)	83.16	40.99	40.84	44.8	10.85	17.52	49.34	21.27	73.12
Tribal(200)	60.06	70.91	7.83	12.41	2.31	8.84	33.30	1.99	85.57
Age									
60 – 70 yrs(450)	86.39	65.03	35.54	35.47	11.47	14.31	50.18	18.03	81.22
>70 yrs(150)	61.79	53.65	31.29	33.89	9.87	12.69	43.45	23.42	78.94
Sex									
Male (279)	93.21	65.11	37.09	36.74	12.46	13.99	54.89	21.08	83.64
Female(321)	65.78	58.99	32.22	33.63	9.51	13.83	41.32	17.82	78.04
Food habits									
Vegetarian(375)	86.54	61.50	40.91	14.04	38.04	14.59	24.24	53.57	76.0
Non vegetarian (225)	69.71	63.56	23.34	5.9s5	29.90	12.74	10.85	39.84	88.55
Income									
Rs.<5000/-(197)	61.42	68.34	10.19	2.37	15.19	9.26	32.97	33.37	82.29
Rs.5000 – 10000/-(162)	77.49	47.90	30.04	8.96	40.09	16.73	50.16	43.51	77.71
Rs.>10000/-(241)	95.34	64.48	54.07	18.33	47.09	15.97	69.2	61.77	80.85
Occupation									
House wife(142)	102.68	68.92	39.47	43.37	19.15	14.05	62.66	27.91	76.09
Farmers(334)	68.40	59.29	22.29	27.28	5.26	13.09	38.46	10.04	82.63
Government service(66)	89.09	67.62	71.33	44.31	19.43	15.42	61.65	38.38	79.16
Private service(58)	84.74	56.83	50.72	49.22	15.35	16.65	57.01	30.34	82.24

Table 2. Percent adequacy of nutrient intake by the selected elderly subjects from different socio economic background

(n=600)

Socio economic factors	Protein (gm)	Carbohydrate (gm)	Fat (gm)	Energy (Kcal)	Iron (mg)	Calcium (mg)	Phosphorus (mg)	Vitamin C (mg)
Area								
Urban (n= 200)	77.57	142.59	68.61	77.71	52.41	55.11	120.52	94.14
Rural (n= 200)	57.95	102.02	56.39	61.53	42.16	38.69	91.90	64.90
Tribal (n= 200)	46.65	57.53	43.41	45.21	28.65	15.01	64.96	20.11
Age (yrs)								
60 to 70 (n= 450)	64.06	59.43	102.38	64.36	43.86	36.23	97.02	60.25
>70 (n= 150)	50.30	45.88	95.65	52.50	32.30	36.35	78.17	58.21
Sex								
Male (n= 279)	57.87	51.06	101.47	60.62	44.10	38.49	99.27	63.24
Female (n= 321)	63.17	60.53	99.90	62.19	38.38	34.25	88.15	56.60
Food habits								
Vegetarian(n=375)	64.83	59.54	112.84	65.60	43.86	41.63	98.76	70.48
Non vegetarian (n=225)	53.61	50.24	79.68	54.32	36.22	26.95	81.47	41.01
Income (Rs.)								
<5000/-(n=197)	46.76	43.84	58.60	45.51	28.48	16.05	65.30	22.47
5000 to 10,000/-(n=162)	54.72	53.41	88.30	57.53	40.36	32.18	85.98	48.60
>10,000/-(n=241)	73.55	66.25	136.77	74.80	50.47	52.71	115.01	91.67
Occupation								
House wife (n=142)	71.72	67.19	124.15	70.94	44.32	44.65	102.46	74.31
Farmers (n=334)	51.16	48.70	75.27	52.20	34.38	25.29	76.38	37.84
Govt. Service (n=66)	78.13	65.16	150.10	78.38	58.96	62.34	131.32	112.26
Private service (n=58)	69.04	61.62	133.67	72.54	51.29	49.25	116.35	90.17

Table 3. Haemoglobin content of blood among selected elderly subjects from different socio economic status

Socio economic factors	Hemoglobin (mean ± SD)	't' values
Area		
a. Rural	8.81±1.05	NS
b. Urban	9.09±1.07	
Age(yrs)		
a. 60 – 70	9.04±1.07	NS
b. >70	8.43±1.01	
Sex		
a. Male	9.86±0.62	10.23**
b. Female	8.12±0.58	
Food habits		
a. Vegetarian	8.99±1.02	NS
b. Non vegetarian	8.82±1.23	
Income (Rs.)		
a. <5000/-	7.9 ±0.0	NS (a vs b) 6.94** (a vs c) NS (b vs c)
b. 5000 – 10,000/-	8.64±1.33	
c. <10,000/-	9.08±0.96	
Occupation		
a. House wife	8.17±0.64	NS (a vs b) NS (a vs c) NS (a vs d) NS (b vs c) NS (b vs d) NS (c vs d)
b. Farmer	9.04±2.82	
c. Government job	9.73±2.53	
d. Private job	9.11±2.07	

Table 4. Prevalence of anemia in selected elderly subjects belonging to different socio economic status

Particulars	n=40			
	Normal >11.0	Mild 8.9-10.9	Moderate 6.6-8.8	Sever <6.5
Area				
Urban	2(5.00)	9 (22.50)	9 (22.50)	00
Rural	00	10 (25.00)	10 (25.00)	00
Age (years)				
60 – 70	2(5.00)	14 (35.00)	15 (37.5)	00
>70	00	5 (12.5)	4 (10.00)	00
Sex				
Male	2(5.00)	15 (37.50)	2(5.00)	00
Female	00	4 (10.00)	17 (42.50)	00
Food habits				
Vegetarian	1 (2.50)	17 (42.50)	13 (32.50)	00
Non vegetarian	1 (2.50)	2(5.00)	6 (15.00)	00
Income (Rs.)				
<5000/-	00	2(5.00)	2(5.00)	00
5000 – 10000/-	00	2(5.00)	4 (10.00)	00
>10000/-	2(5.00)	15 (37.50)	13 (32.50)	00
Occupation				
House wife	00	2(5.00)	10 (25.00)	00
Farmers	00	5 (12.50)	4 (10.00)	00
Government service	1 (2.50)	5 (12.50)	4 (10.00)	00
Private service(58)	1 (2.50)	7 (17.50)	1 (2.50)	00

Further they were categorized under different grades of anaemia. It is evident from table that, the equal percent of urban (22.50 %) and rural (25 %) elderly were suffering with mild and moderate grade of anaemia. Maximum elderly of 60 to 70 years of age group were suffering mild (35 %) and moderate (37.5 %) grade of anaemia. However, 37.50 percent elderly male were suffering with mild grade of anaemia. While 42.50 percent female suffering with moderate grade of anaemia. Surprisingly it was also noted that, majority of elderly belonging to high income group was suffering with mild and moderate grade of anaemia (32.50 to 37.50 %). Further it was also noted from the table that, majority of housewife were found to be suffering with moderate grade of anaemia followed by the elderly belonging to private service category. In the nutshell, it can be concluded from table that, elderly female followed by vegetarian elderly of 60 to 70 years of age groups and those who were belonging to high income group were found to be suffering with moderate grade of anaemia. Very few (only 2) elderly were observed as normal. However, none of the elderly were in the category of sever grade of anaemia.

Conclusion

It can be concluded from the above findings that, occupation of elderly also affected on percent adequacy of food intake. Intake of cereals, green leafy vegetables, milk and milk products were found to be more by elderly retired as government servant. Percent adequacy for all nutrient was noted very low by elderly who were belonging to farming community as compared to their other counterparts. Elderly female followed by vegetarian elderly of 60 to 70 years of age groups and those who were belonging to high income group were found to be suffering with moderate grade of anaemia.

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