

NUTRITION OF GERIATRIES

Introduction :

Gerontology is a branch of science, which deals with the study of ageing processes. This is derived from a Greek word called "Geront" means old man and "Ology" refers to a branch of knowledge of science. It was introduced in 1903 by Elie Metchnikoff. Gerontology embraces studies from a biological, behavioural and social science perspective. Geriatrics refers to a branch of medicine that specialises in the care and treatment of disease and health problem of older person. Aging is characterised by failure to maintain homeostasis under condition of physiological stress and this failure is associated with a decrease in viability and an increase in vulnerability of the individual. Aging brings changes at many levels such as Social, Psychological (behavioural), Physiological, Morphological, Cellular and Intrinsic.

Aging changes should satisfy four criteria. They should be universal in the species, degenerative, progressive and intrinsic. The general feature of old persons are :

- a. Wrinkling of skin
- b. Sunken eyeball
- c. Baldness
- d. Loss of weight
- e. Dimness of vision
- f. Heard of hearing
- g. Decrease appetite
- h. Forgetfulness
- i. Mild decrease in one's intellect
- k. Graying of hair

Nutrition is the science of the relationship of health, well being and disease to ingestion, absorption and use of food and nutrients (Ebersole and Hoss, 1985; Worthington, 1979) An accurate nutrition assessment requires an understanding of the physiologic processes of ingestion, digestion, absorption, cell metabolism and excretion.

With advancement of age there is diminution of smell and taste as a result of which there is diminished appetite and decrease consumption of food. Due to carries of teeth and periodontal disease there is loss of teeth which effects in the intake of nutrients. Further decrease secretion of saliva saliva leads to dryness of mouth so in the oesophagus there is increase in non-propulsive contraction which leads to dysphagia. Gastric acid secretion is reduced which leads to diminished digestion and absorption of iron. Pancreatic enzyme secretions is not very much altered so fat digestion absorption are not impaired.

Blood flow to small intestine is reduced by 40%. There is reduction of absorption capacity by 30%. Motility of large intestine becomes less and the elasticity of rectal wall decrease with advancing age and constipation is likely to be a frequent complaint. Liver loses weight from the age of 50 but no consistent effect on enzyme activity.

Nutrition is an important item in the aging process but not sole for physical health and mental vigour. People have an instinctive appetite for the pleasure of eating but desire for food does not necessarily assure availability, adequate intake of nutritional balance. The food eaten must furnish building materials for skin, bone, teeth, blood and all other body components and for their repair.

Many times poor food habit, reduced income, racial and cultural patterns, poor dental health and chronic diseases impact heavily the nutritional status of the elderly individuals.

Calorie requirement :

The calorie requirements gradually decrease with age because of a reduction in the Number of metabolically active cells. The calorie requirements are usually diminished by 100% people aged 51-75 and 20 to 25% reduced in those older than 75 (Roe, 1999). Again if it is critically analysed we observe there is large variations in the need for calories according to age, sex, size, occupation, environment, physical activity, habits and the presence or absence of chronic illness. It is estimated that for elderly male the calorie requirement is 1800 k. cal. and in elderly female, it is 1400k. cal. (I.C.M.R. - R.D.A. 1995)

Experiment in animal model it is proved that calorie restriction seems to increase the life span. Calorie restriction without restricting micronutrients or other nutrient such as vitamins is the most diversified anti aging laboratory maneuver in the field of experimental gerontology (Weindruch and Walford 1968, Madoro 1992). The well recognised anti ageing action of calorie restriction are :

- a. prevention of age related functional deterioration
- b. retardation of onset of progression of age related diseases.
- c. extension of mean and maximum life span.

Requirements of different nutrients of old age people

Proteins

The recommended allowances of proteins for female & male elders / day are 50 gms. & 60 gms. respectively (I.C.M.R. - 1995). 12-14 of the calories in the average daily diet should be derived from proteins.

Food such as meat, fish, eggs, chickens, organ meat, pulses, mushrooms, milk, cheese, oil seeds and nut provide high quality of proteins.

Fats

The desirable fat intake for older does not differ from that of younger adults. The diet should contain 10-20 gms. of fat per day. Half of the quantity should be in the form of vegetable oils, rich in essential fatty acids. A diet with high content of saturated fatty acids such as ghee, butter coconut oil, hydrogenoid fat tends raise blood cholesterol while relatively rich in polyunsaturated fatty acids such as gingerly oil, sunflower, refined oil, groundnut oil, rich bran oil tend to decrease cholesterol level.

Carbohydrates

The optimum quantity of carbohydrates is placed between 50-70% of total energy.

Vitamins

Vitamins do not yield energy but act as catalysts in various body processes. Since vitamins cannot be manufactured in the body, those should be supplied from outside through diet. Deficiencies of vitamins can cause serious nutritional problems affecting older adults. Older adults with a food energy intake of approximately 1500k.cal. should probably take a vitamin & mineral supplement.

The recommended doses of vitamins are as follows :

Vitamin A	- 2400 microgram / day (I.C.M.R. R.D.A.)
Vitamin C	- 40 mg / day (I.C.M.R. R.D.A.)
Other vitamins as per adults requirements (I.C.M.R)	
Vitamin D	- 2.5 micro grams / day (W.H.O.)
vitamin E	- 15 I.U / day
Vitamin K	- Daily diet contain require quantities (I.C.M.R.)
Thiamin	- 0.5 mg / 100 k. cal. / day (I.C.M.R.)
Riboflavin	- 0.6mg / 1000 k.cal. / day (I.C.M.R.)
Niacin	- 6.6 mg / 1000 k.cal./day (W.H.O.)
Pyridoxin	- 1.5 mg / day (I.C.M.R.)
Pantothenic acid	- 10mg / day
Folates	- 1000 micro grams. / day (I.C.M.R.)
Cyanocobalamin	- 1 micro gram / day (I.C.M.R.)

Minerals

The body contains about 24 mineral, which are needed for

- a. formation of bone & teeth.
- b. maintenance of osmotic pressure of body fluids.
- c. for serving specific function such as blood formation by iron and normal functioning of thyroid by iodine.

Those mineral include calcium, phosphorus, iron, sodium, potassium, chlorine, sulphur, magnesium, iodine, zinc, manganese, molybdenum, cobalt, selenium, chromium, bromine, fluorine, aluminium, arsenic, and few others. Some of the minerals are called trace elements as they are required in micro quantities by the body. Many of these minerals are widely distributed in foods so that a well balanced diet contains them in sufficient quantity.

A brief account of their requirements are given below.

- Calcium - 400 - 500 mg/day (I.C.M.R)
- Phosphorus - at least equal or perhaps twice as great as calcium intake (Beaton, G.H. et.al.
- Sodium - 10-15 gm/ day (I.C.M.R.)
- Potassium - Not determined accurately
- Magnesium - 200 - 300mg / day (Beaton G.H. ea. al.)
- Iron - 24mg / day (I.C.M.R.)
- Iodine - 0.10 to 0.14 mg/day (Beaton G.H. et. al.)
- Flourine - drinking water flourine concentration should be 0.5 to 0.8 mg / litre of water (Jolly, S.S. et. al.)
- zinc - 5-10 mg/day (Beaton G.H. et. al.)
- Copper - 2 micro grams / day (Standsteal H.H. et. al.)
- Cobalt - Not recommended - useful for capture of iodine of glands (J. Indian M.A.)
- Chromium - not recommended. Plays a role in relation to carbohydrate and insulin function.
- Selenium - Not recommended But deficiency occurs in P.E.M. (Stand steal H. et. al.)
- Molybdenum - deficiency is associated in mouth / oesophagus cancer (J. Indian M.A.)

Dietary fibre

Dietary fibre provides bulk in diet. It maintains good intestinal motility, establishes regular bowel movements and prevents constipation. The elderly should take 40 gms. of dietary fibre per day. High fluid intake is essential along with fibre food.

Substances contain good deal of fibrous matters, roughage are millet, wheat, ragi, horse gram, rice bran, plantain stem, cabbage, cauliflower, drumstick, gauva, wood apple etc.

The diet in elderly should be well balanced with carbohydrates, proteins, fats, minerals and vitamins.

Recomended daily allowances for Indian elderly is presented below.

Recomended Daily Allowances for Indian Elderly (I.C.M.R. 1995)

<u>Nutrients</u>	<u>Male</u>	<u>Female</u>
Calories	1800**	1400**
Protein (gm.)	60	50
fats (gm.)	50	40
Calcium (mg.)	400	400

Iron (mg.)	28	30
Vitamin A (micrograms)	2400	2400
Thiamin (mg.)	1.2	0.9
Niacin (mg.)	16	12
Riboflavin (mg.)	1.4	1.1
Vitamin C (mg.)	40	40

- R.D.A. of secondary habit
- ** - 25% of less R.D.A. of secondary habit

There is no specific dietary rules for old people. They should continue to eat as far as possible what they have been eating and digesting for the past years. It is to be ensured that the food they eat is wholesome and nutritious. Those who suffer from hypertension, renal disease or any other disease the food restriction for them should be observed strictly.

A model balanced diet chart for the elders (1800 k. cal.) is delineated below.

1 cup = 200ml.

1 t.s.f. = 5ml.

Early morning

1 cup Coffee or Tea (with ½ cup of milk & 2 t.s.f. sugar)

Break-fast

Iddly - 3 (medium) or Chappati - 3 (medium) or

Uppama 1 1/2 cups or Bread 4 slices (small)

Egg white - 1 or Apple (medium) - 1

Mid-morning

Milk 3/4th cup (with 1 t.s.f. sugar) or

Butter milk - 1 cup or soup - 1 cup or

Fruit - juice - 1 glass or Vegetable salad.

Lunch

Cooked rice - 1 ½ cups or Chappati - 3 (medium)

Sambar or dal - 3/4th cup, Chicken or Fish - (1pc)

Curry, Rassam, curd ½ cup or Butter milk - 1 cup

Greens ¾ cup

Tea

Coffee or Tea - 1 cup (with ½ cup of milk and 2 t.s.f. sugar)

Dinner

Iddly - 3 or Chappati - 3 (medium) or

Cooked rice 1½ cups (other same as lunch)

Bed-time

Milk - 1 cup (with 2 t.s.f. sugar)

Conclusion

From above exposition it is understood that

- a. Adequate nutritional care for the older adults deserves considerable emphasis because not only for more comfortable and energetic life but is better able to tolerate medical and surgical treatment.
- b. Factors contributing to nutritional deficiencies in older adults include poor food habits, reduced income, racial & cultural patterns, poor dental health and chronic diseases.
- c. Nutritional education during whole life span is imperative.
- d. Risk factors such as tooth loss, medication effects, diminished smell & taste, impairment of cognition & physical functioning and socio-economic, cultural, and environmental factors can directly effect appetite, digestion and nutrition.
- e. Proper nutrition is vital for healthy aging and can be achieved by taking a well balanced nutritious diet.

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