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Older Adults and Health Maintenance (1)

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Abstract

Ageing is a complex process that has not yet been fully understood. It is however, described as a normal process of time-related changes, beginning from birth and continuing throughout life. The effect and signs of the changes usually manifest in older adults. Older adults'- encompass persons who are 65 years and older. The changes consequently have a direct impact on all the systems, organs and functions of the body. These changes make older adults more vulnerable to diseases. This paper addresses the normal age-related changes that occur in the gastrointestinal system and the benefit of nutritious diet for older adults. Considering the normal changes that occur in the gastrointestinal system, older adults need to maintain their health by taking nutritious diets and readjusting their lifestyles. Such precautions would enable older adults to enjoy good function of mind and body and live independently and with good quality of life.

Keywords: Ageing, Older adults, Age-related changes, Malnutrition,

Introduction

Ageing is an unavoidable and inexorable process in life1 which results from intrinsic factors that are genetically programmed and essentially universal within a specie. The process is hastened by extrinsic factors such as - toxins, radiation, bacteria, viruses, pollution illness or disease conditions, etc.2 Normal ageing is not a disease, nor is it a condition that is correctable by medical or surgical intervention.3 The signs and symptoms of ageing are usually physically manifested in older adults.

Older Adult encompasses persons who are 65 years and older. Series of biological and physiological changes take place in such individuals before getting to the age of 65. This "journey" suggests why ageing is described as a gradual and continuous normal process of time-related changes, - it begins, with birth and continues throughout life. The changes make the body structures and functions to undergo a number of physiological changes that do not involve a pathological process.4 However, the changes consequently have direct impact on the functional abilities of organs (such as heart, kidneys, and lungs), biological systems (such as the nervous, digestive, and reproductive systems) and ultimately the whole body.5 Ageing is characterized by declining ability to respond to stress and loss in homeostasis and, with it, vulnerability to disease; which sometimes leads to death6 Despite these bodily changes the individual enjoys good function of mind and body, and is able to live independently, and with a good quality of life.

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Many of the changes associated with the process of ageing can promote malnutrition.7 This topic becomes more relevant than ever before because malnutrition among the older adults has become a serious problem as it increases;8 about 16% of those over 65 years and 2% of those over 85 years are said to be malnourished9;10. Despite this poor situation, the older population worldwide is increasing. World Health Organization indicated that 605 million persons (20%) are currently over 60 years and by 2025, it is estimated that this number will have grown to 1.2 billion (29%).11 Furthermore,12 WHO pointed out that the increasing number of older adults is more rapid in developing countries, and forecasted that by 2020, over 70% of people aged 55 and older will be living. More specifically,13 WHO projected that by 2025 there will be over 80% of older adults in Nigeria. Therefore to approach the risk of malnutrition in the healthy older adults in the society, early prevention of malnutrition becomes paramount. This would be achieved by older adults taking appropriate food and drinks that suits the changes that occur with ageing. This paper addresses the normal age-related changes in the gastrointestinal (GI) system, nutrition, and strategies to maintain health.

Normal Age-related changes in the gastrointestinal (GI) system

Common factors emerge when looking at age-related changes. Many changes are effected by a decrease in blood supply to tissues because of the natural deposition of fat and calcium in the vessel intima. The resultant reduced circulation perfusion is also thought to produce the diminished endocrine secretion commonly noted in old age.14 Also long life use and abuse of the body through accidents, athletic injuries, and other physical trauma are responsible for some of the changes thought of as wear and tear.

The large functional reserve capacity of most of the gastrointestinal (GI) system, suggests why ageing has relatively little effect on GI functioning. The gastrointestinal (GI) system consists of the mouth, teeth, tongue, salivary glands, pharynx, oesophagus, stomach, small intestine, large intestine (colon), pancreas, liver, and gallbladder. The major functions of this system are the processing of food and the absorption of nutrients, minerals, vitamins, and water. Essentially, normal digestion and absorption of substances occur in the older adults; though there are many age-related changes as well in the digestive system.

The mouth, teeth, tongue and salivary glands play a major role in mastication (chewing) and digestive process of food that enter the mouth. With age, the stratified epithelium (lining) of the mouth becomes thinner and more fragile making it susceptible to wear and tear. In the process of ageing, there is shrinkage of the maxillary and mandibular bones and reduction of calcium content in the skeleton; these cause slow erosion of the tooth sockets leading to gum recession and eventual tooth loss15. Periodontal disease can also lead to tooth loss with age, and enamel becomes harder and more susceptible to gingival retracts. Lack of teeth or poorly fitting dentures can make eating and chewing extremely difficult, contribute to inadequate dietary intake which may lead to malnutrition.16 17 18 The effects of tooth loss or other oral problems have been associated with eating more foods containing cholesterol and sodium, and highly refined, easy to chew foods that are lacking in dietary fiber.19 The reduced fibres intake and other factors can affect bowel function, causing problems such as constipation.

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Furthermore, saliva which contains ptyalin to break down starch is diminished. The decreased saliva leads to dryness of mouth and discomfort when talking and chewing for the older adult. Normal saliva production is however, said to be unchanged with age.20 The reduction of saliva is rather thought to be due to systemic disorders or their treatment.

Taste and smell make food intake enjoyable. With age there is a decrease in taste (gustatory) bud and sense of smell (olfactory)21. The number of fibres in the olfactory bulb and olfactory receptors decrease reducing the sense of smell. The olfactory loss may also be caused by age-related bone growth in the skull pinching off sensory nerve fibres. These changes account for loss in the ability to discriminate between different smells.22 The decline in sense of smell decreases food intake in older adults and can influence the type of food eaten. It has also been shown that a reduced sense of smell is associated with reduced interest in and intake of food,23 and appetite suppression, resulting in weight loss and malnutrition. The older adults tend to have preference for sweet and salty food to compensate for their lack of taste. This may aggravate health conditions like hypertension and diabetes. The loss of sense of taste is not understood fully but may be caused by a reduced number of taste buds.

In the oesophagus of older adults, the muscle strength and motility diminish leading to decreased Oesophageal peristalsis (intestinal muscle contractions), that can slow swallowing; increasing pharyngeal transit time which may lead to dysphagia (swallowing difficulty). This may increase the likelihood of the older adult choking and the sensation that food (or medication) is stuck in the throat. Also the muscular sphincters weaken with age; this can cause the backflow of the stomach content into the oesophagus leading to gastro-oesophageal reflux which will result in heartburns. The inadequate peristaltic action and relaxation of the lower oesophageal sphincter slows the emptying of the oesophagus, causing an early feeling of fullness. A weakened gag reflex also increases the risk of aspiration.

The capacity of the stomach lining to resist damage declines with age due to weakened mucosal barrier. Gastric bicarbonate and mucus normally provide an alkaline gel layer that defends against lumen acid and pepsin. But the secretion of bicarbonate declines significantly with age; also the protective prostaglandin content in the mucus declines making the stomach of the older adult more susceptible to damage by abrasion, acids, enzymes or the gastric contents. This in turn may increase the risk of peptic ulcer disease, especially in people who use aspirin and other nonsteroidal anti-inflammatory drugs (NSAIDs)24. In addition the stomach cannot accommodate much food (because of decreased elasticity), and the rate at which the stomach empties food into the small intestine decreases. Ageing has little effect on the secretion of stomach juices; however, there is decrease in the number of parietal cells and in the amount of gastric acid, pepsin and intrinsic factors which are essential for the absorption of calcium and vitamin B12. The decrease in pepsin results in protein indigestion while the decrease in vitamin B12 and iron result in pernicious anemia that is common with older adults25.

Ageing has only minor effects on the structure of the small intestine. The main function of the small intestine is food digestion and absorption. It produces a range of enzymes and also

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uses secretions from the pancreas and liver. The transport of food through the small intestine and absorption of most nutrients does not change much. However, there are changes in the metabolism and absorption of lactose, lipid, calcium, iron and Vitamin D. The reduced absorption of lipid inhibits the absorption of fat and oil in the small intestine. With age the small intestines absorb less calcium. The reduced absorption of calcium can cause osteoporosis.26 Therefore, older adults need more calcium to prevent bone mineral loss and osteoporosis. The decline level of lactase which aids the digestion of lactose (a sugar found in dairy products) often leads to intolerance of dairy products. The overall reduction in acid secretions that occurs predisposes the gut to small bowel bacterial overgrowth. Excessive growth of certain bacteria becomes more common with age and can lead to pain, bloating, and weight loss. Bacterial overgrowth may also lead to decreased absorption of certain nutrients, such as folic acid, iron, and calcium, which may affect the health status of the older adults.

The large intestine (colon) does not undergo much change in the older adult. There is a reduction in the lubricating mucus and weakening of the muscles in the large intestine which results in reduced peristalsis. The weakening of the intestinal walls may lead to outpouching of small segments of the colon (diverticula). The slow peristalsic activity of the large intestine of older adults can affect the movement of contents through the large intestine and the transition of waste product into the rectum, causing constipation. Also the intestinal sphincter of the large intestine loses its muscle tone with age; this can create problems in bowel evacuation. Another contributory factor is ignoring the urge to defecate over a period of time. Constipation is further aggravated by a low intake of fiber and water, inactivity, medications, and overuse of laxatives and antacid. Straining to eliminate faeces may put additional pressure on weakened blood vessels walls leading to haemorrhoids.

With age, the pancreas decreases in weight, and some tissues are replaced by scarring (fibrosis). The beta cells found in the islet of Langerhans of the pancreas, lose their ability to secrete insulin leading to increased blood glucose level in older adults.

Generally, the liver plays important roles in processing the body's metabolism, as well as affecting the uptake of medications, and serum cholesterol. However, with age, there is diminished capacity to regenerate damaged liver cells and the liver shrinks, thereby receiving a smaller supply of blood. There is altered clearance of some drugs in the liver thus prolonging the effects of drugs, which then predisposes older adults to drug overdose, and the half life of certain drugs like benzodiazepines, chlordiazepoxide, diazepam, and aminopyrine, may be doubled due to decreased metabolism by the liver. The production and flow of bile decreases with age. This results in decreased absorption and tolerance of fat. The gallbladder which stores the bile manufactured by the liver does not seem to change with age. However, the incidence of gallstone and common bile duct stone tend to increase. This may be due to the raised cholesterol saturation.

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Nutrition and strategies to maintain health

Studies have shown that anatomical and physiological changes of ageing, and other factors have an impact on nutritional requirements of older adults27 28 29. With this awareness, nutrition is increasingly being recognized as a major area of concern for the older adults and healthy ageing30 31. Nutritious daily diet is one factor that can assist people who are 55 and older in maintaining optimal levels of health and preventing or delaying the onset of disease.32 The Food Guide Pyramid (FGP) Fig. 1 is helpful to guide food selection and daily serving.

Food guide pyramid for older adults, Department of Agriculture, Washington, DC33

Below the food pyramid diagram, is an addition of six to eight glasses of water; this is necessary because fluids are so critical for older adults. Older adults are more susceptible to develop problems with fluid and electrolyte balance due to physiological renal impairment and changes in thirst perception.34 The food pyramid is an easy and systematic way for a person to evaluate nutritional intake and make corrective adjustments. The older adult requires a variety of food to maintain balanced nutrition.

Healthy ageing involves the interaction between genes, the environment, and lifestyle choices of individuals. The most modifiable lifestyle factors are eating habits and physical activity.35 Normally, nutritional requirements do not change with age, older adults have the same nutrient requirements as their younger counterparts; but caloric requirements do change. The change is associated with changes in metabolic rates, body mass, activity levels, and exercise tolerance.36

In older adults, several factors combine to cause a greater need for calcium. Some degree of osteoporosis is normal, but a sedentary lifestyle compounds the problem. The rate of bone loss usually decreases if calcium levels are kept elevated – which can be done through exercise, diet, and supplementation. The older adults are also more likely to require Vitamin D3 supplementation if they are to absorb the calcium efficiently. Many older adults tend to avoid the sun because of skin changes it causes. This slows sun damage to the skin, but also eliminates the natural production of vitamin D3 that is essential for the body. This vitamin is converted to the hormone calcitriol, which stimulates calcium absorption by the small intestine.

The recommended dietary allowance (RDA) for protein is 0.8 g protein/kg body weight per day for adults regardless of age37. This is the minimum amount of protein intake required to avoid progressive loss of lean body mass. Evidence has revealed that protein intake greater than the RDA helps to improve muscle mass, strength and function in older people. Furthermore this intake can improve immune status, wound healing and blood pressure.38 39 Disagreed with the concerns that have been indicated regarding the detrimental effects of increased protein intake on bone health, renal function, neurological function and cardiovascular function. It was suggested that the RDA intake of 1.5 g protein/kg body weight per day is a reasonable intake for older people to optimize protein intake in terms of

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health and function.40 41 But more easy-to-digest proteins, that is, more vegetable proteins, fish, and less animal products is encouraged for older adults, because the rate of protein synthesis is decreased with age.

Older adults need to be encouraged to maintain good oral hygiene and go for regular dental care. This will stimulate appetite and prevent oral mucosa infection. Food needs to be palatable and attractive and eaten when warm to stimulate appetite, and make eating more pleasurable. A few studies have shown that improving flavor of foods can also improve nutritional intake.42 43 Frequent little quantity of food is encouraged for older adults being that the capacity of the intestine is reduced and to minimize the feeling of fullness; and not to eat late. These would aid digestion. Taking soft nutritious diet reduces the stress of mastication. Highly spiced food need to be reduced to easy the effect of heartburns and irritation of the walls of the intestine. The intake of excessive salt and simple sugar is discouraged for older adults being that they are prone to hypertensive and diabetic conditions. They are rather encouraged to take complex carbohydrates (yam, potatoes, whole grains, and brown rice). Taking of high-fibre diet such as vegetable, fruits and tapioca and water, and maintaining of regular bowel habits is also important. Older adults also need to avoid the use of laxatives and antacid. These would help to reduce constipation, diverticuli and haemorrhoids. Pelvic exercises like contraction and relaxation of the external anal sphincter at intervals would help to strengthen the anal sphincter muscle and prevent fecal incontinence. Older adults also need to reduce the intake of saturated fats because of the difficulty of digesting them. Food rich in iron such as unripe plantain, spinach is encouraged; this would help to prevent anaemia.

The dosage of drugs needs to be checked to prevent dose-related side effect. Smoking is discouraged more so for older adults because it interferes with absorption particularly of vitamins C and folic acid.44

Also alcohol intake needs to be moderate because of the limited ability of the liver to detoxify it.

Conclusion

Ageing is an inevitable process that all living beings go through. The changes that occur leave the body of the older adult vulnerable to disease conditions. This awareness calls for readjustment of older adult's dietary pattern to enhance the process of growing old graciously; and for the younger adult to cultivate good dietary habit and lifestyle that would not hasten the ageing process. The older adult is encouraged to take a diet high in grain products, vegetables and fruits, and low in saturated fatty acids, cholesterol, sugar, salt and alcohol. These suggestions highlight the lower energy requirement of the older adults and the need for particular attention to intakes of water, fiber, calcium, vitamin D and vitamin B12. Older adults maintaining good nutrition would enhance their health and live longer.

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