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Review article

Nutrition and the Role of Tube Feeding in the Elderly

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Abstract

As the population ages, more elderly patients will come in contact with the medical profession. Malnutrition among the elderly is common and often, remains undetected by medical staff and carries serious implications for general poor health, increased morbidity, mortality, mortality, prolonged hospital stay, poor wound healing, pressure sores and increasing costs. Early assessment of the nutritional status among older people is, therefore, important to identify those who are malnourished or at risk of malnutrition in order to reduce the further decline in weight, physical function and quality of life. Sarcopenia is the loss of muscle mass and strength associated with aging associated with under-nutrition. Sarcopenia increases the risk of disability and functional decline. The causes of under-nutrition are multiple among the elderly and interventions should be instituted early. Tube feeding is often recommended for the elderly who are unable to maintain adequate oral intake. Tube feeding has its benefits but is also associated with complications and risks. The risks and benefits of tube feeding need to be carefully weighed for every individual older patient.

Keywords: Nutrition; Elderly; Protein intake; Tube feeding

Introduction

The number and proportion of elderly, defined as those aged 65 and above, are on the rise worldwide. WHO figures show that by 2025, there will be nearly 1.2 billion elderly with 840 million of them residing in low-income countries [1]. The elderly are vulnerable to developing malnutrition because of their physiological changes, social circumstances, and financial constraints. Nutrition plays an important role. The malnourished elderly are at increased risk of pressure ulcers, poor wound healing, falls, hip fractures, cognitive deterioration, anemia, frailty, impairment of immune system, hospital mortality, prolonged hospital stay and higher costs [2-5]. The hospitalized and institutionalized elderly are even more vulnerable to developing malnutrition, and because of their multiple chronic medical conditions, are frequently hospitalized. After hospitalization, 100% of patients aged >85 and 80% of patients aged 75-84 may be at high risk of malnutrition [6]. Much focus on healthy eating is common among the elderly to promote better cardiovascular risks reduction. Medical staffs are often unaware of the poor outcomes associated with general poor nutrition and unintended weight loss. This paper will discuss the common disorders associated with poor nutrition among the elderly management strategies and the role of tube feeding among commonly encountered subgroups of patients.

Malnutrition and the elderly

A local study in an acute Geriatric ward in Singapore per-

formed the Mini Nutrition Assessment (MNA) within 48 hours of admission on 150 communities dwelling elderly aged 65 and above (range 65-97 years), with similar numbers in gender. Only 10% of the study population was well nourished, 52% were at risk of malnutrition and 38% were malnourished at the point of admission. The well-nourished elderly had a better physical function as measured by the Barthel score compared to the other two groups. The length of stay was shortest among the well-nourished group (mean 7.5 days compared to 17 days and 10 days) although the difference did not reach statistical significance.

In a separate study by Morley et al, up to 15% of community-dwelling elderly and approximately 85% of nursing home residents were malnourished([i]). Among the hospitalized elderly, Correia showed that patients with malnutrition had a high risk of complications associated with hospitalization (27% RR=1.6) and longer length of stay (16.7 days Vs 10.1 days). Mortality rate was increased (12.4% Vs 4.7%) and the cost of hospitalization was increased by up to 308% [2].

Protein-energy malnutrition (PEM) results from an imbalance between the intake (of proteins, vitamins and minerals) and the body's requirements. This imbalance causes tissue loss, especially muscle, resulting in sarcopenia and frailty with harmful consequences. PEM has also been linked to pressure ulcer development among the hospitalized and institutionalized elderly. Patients identified as malnourished at the point of hospital admission had twice the risk of developing pressure ulcers compared to the well-nourished elderly [7].

Nutritional problems are more common among institutionalized elderly (85% Vs 15%) compared to community-dwelling elderly [8]. In a long term care setting, 65% of residents with severe malnutrition developed pressure ulcers, compared to none in the well-nourished group or the at-risk group [9].

The risk factors for developing PEM among the elderly are listed in Table 1. In a single individual, multiple factors are often involved [3].

Nutritional assessment and Screening Tools

Early nutritional screening identifies patients at risk of protein/ energy malnutrition and predicts if nutritional status is likely to worsen. The nutritional assessment examines metabolic, functional and nutritional variables, looking at causes and outcome of poor nutrition, using clinical and biochemical evidence as support. It is, therefore, important to screen for PEM early to allow for early intervention.

There are several validated screening tools, like Malnutrition Universal Screening Tool (MUST) for adults in the community, Nutritional Risk Screening (NRS 2002) for hospital settings and the Subjective Global Assessment (SGA)([ii]). The Mini Nutrition Assessment (MNA) is a widely used screening tool, validated for use in the community, hospitals and nursing homes to detect the presence of malnutrition as well as those at risk of malnutrition. The MNA has a sensitivity of 96% and a specificity of 98% without laboratory parameters and identifies patients who are well-nourished, at-risk of malnutrition and the malnourished groups. The at-risk group has lower protein calorie intake but without weight loss or abnormalities in their serum protein. The malnourished group needs investigations to quantify the severity of malnutrition. The MNA also helps with the planning of interventions, and may identify specific areas for follow up [11,12].

Table 1. Factors predisposing to PEM [3,10]

Anorexia
• Early satiety- ↓ fundal compliance,↑cholecystokinin, delayed stomach emptying • Poor sense of smell and taste with less enjoyment of food • Poor dental health and hygiene • ↑ cytokines • Poorly appealing food including therapeutic diets
Social factors
• Social isolation- eating alone • Financial difficulties • Food availability resulting in rationing of food • Environmental factors- rigid and rushed meal times, lack of assistance
Medical causes
• Organ failure- kidneys, liver, heart, lungs • Medications- SSRI, sedatives, drug interactions and side effects. • GI disorders-constipation, ulcers, gall stones, malabsorption • Endocrine causes- hyperthyroidism, diabetes • Cancers
Dysphagia
• Neurological causes
Psychiatric disorders
• Depression • Paranoia
Dementia
• Lack of assistance during meal times • Neuropsychiatric symptoms of dementia including wandering

Albumin and Body Weight

Serum Albumin levels do not specifically correlate with nutrition, especially in acutely unwell patients. Body weight and BMI are simple and practical measurements for nutrition. Body weight can be compared with the ideal weight. However, the sick patient may also be edematous or dehydrated, which may affect body weight. [13] Jelliffe reported using triceps skinfold thickness as an index of body fat and mid arm circumference as a measure of muscle mass. These measures may be confounded by hydration, age, physical activity and inter-rater variability. The correlation between standards and classifications may also be inconsistent, with 20-30% of healthy subjects being scored as malnourished on set standards [11, 14].

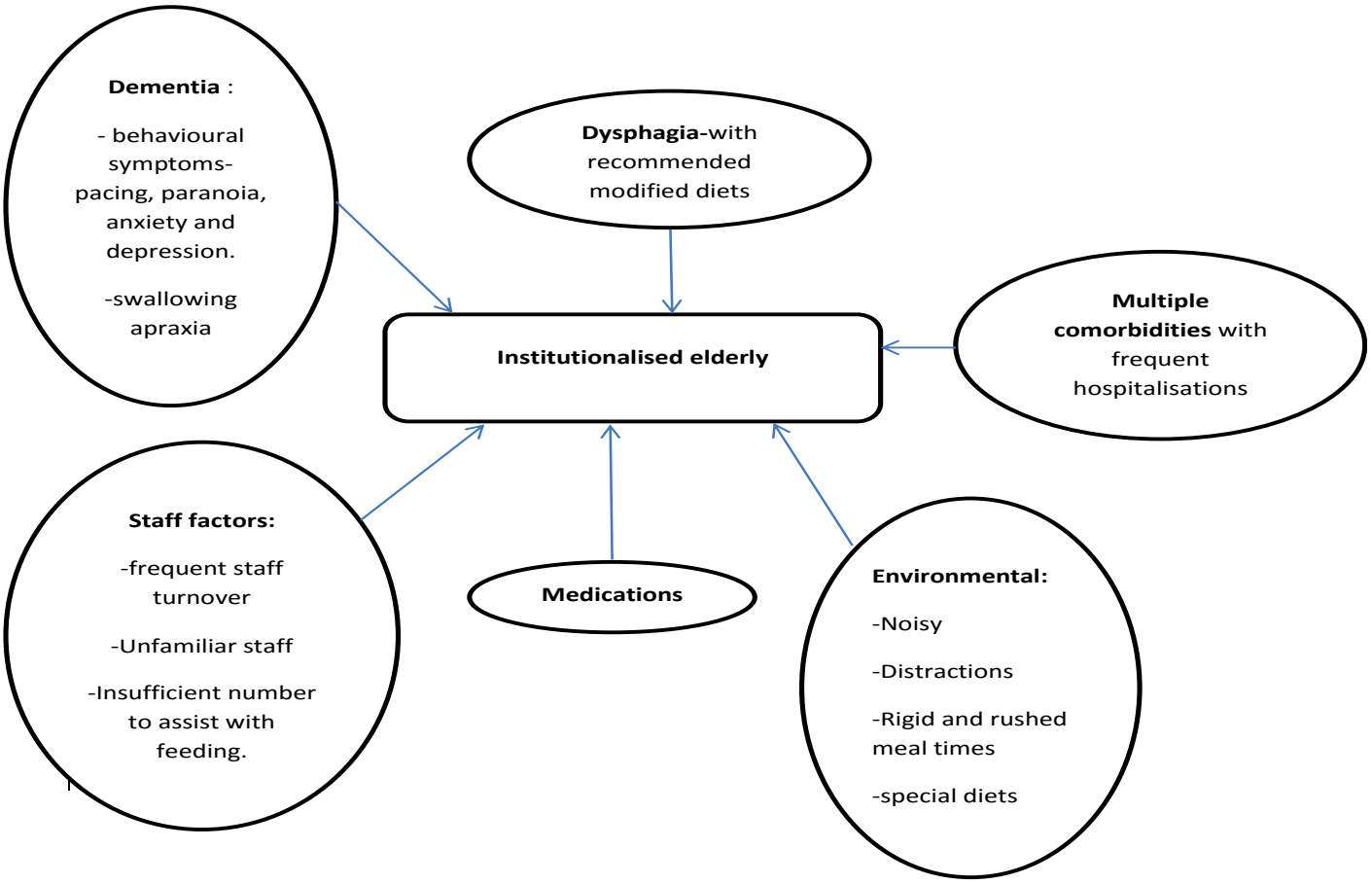
In general, energy consumption has been shown to reduce over the ages of 20-90; with older females consuming 30% fewer calories than younger females; older males consume 43% fewer calories than younger males. Therefore, weight gain at midlife due to reduced energy expenditure may be expected, and weight loss among the elderly is often due to poor intake or an underlying pathology [15, 16].

Older people with unintended weight loss are often overlooked, particularly if they have been overweight. Unintended weight loss results in higher mortality and morbidity. Lilamand et al showed that poor nutrition, with low MNA-Short Form scores among nursing home residents, predicts one-year mortality accurately. Other risk factors included weight loss, low BMI, decreased food intake and recent stress [17]. Common causes of unintended weight loss included depression, cancer and GI disorders. Some 25% had no cause found, despite intensive investigations [10,14].

Long term care institutions

Interviewing care staff may help to further identify unique problems causing poor nutrition for individual patients in long-term care facilities. The factors contributing to poor nutrition among the institutionalized elderly are shown in Figure 1. Individualized strategies are often required to manage poor oral intake in institutions, with speech therapists assessing for swallowing difficulties, recommending dietary and environmental modifications, and having staff trained to supervise meal times [18].

Figure 1. Causes of under-nutrition among institutionalized elderly.



Sarcopenia

Sarcopenia is defined as a loss of muscle mass and strength with a risk of adverse outcomes, such as physical disabilities, poor quality of life and death. Sarcopenia emerges insidiously from the 5th decade of life. The prevalence is 5-13% among those aged 60-70, increasing to 11-50% by 80 years of age [19].

Table 2. Criteria for diagnosis of sarcopenia [20].

Presence of (1) plus either (2) or (3)
1.) Low muscle mass – measured by BIA*, DXA* and anthropometry
2.) Low muscle strength- measured by handgrip strength
3.) Poor physical performance- measured by gait speed or get up and go test

*BIA-Bioimpedance Analysis. DXA- Dual Energy X-ray Absorptiometry

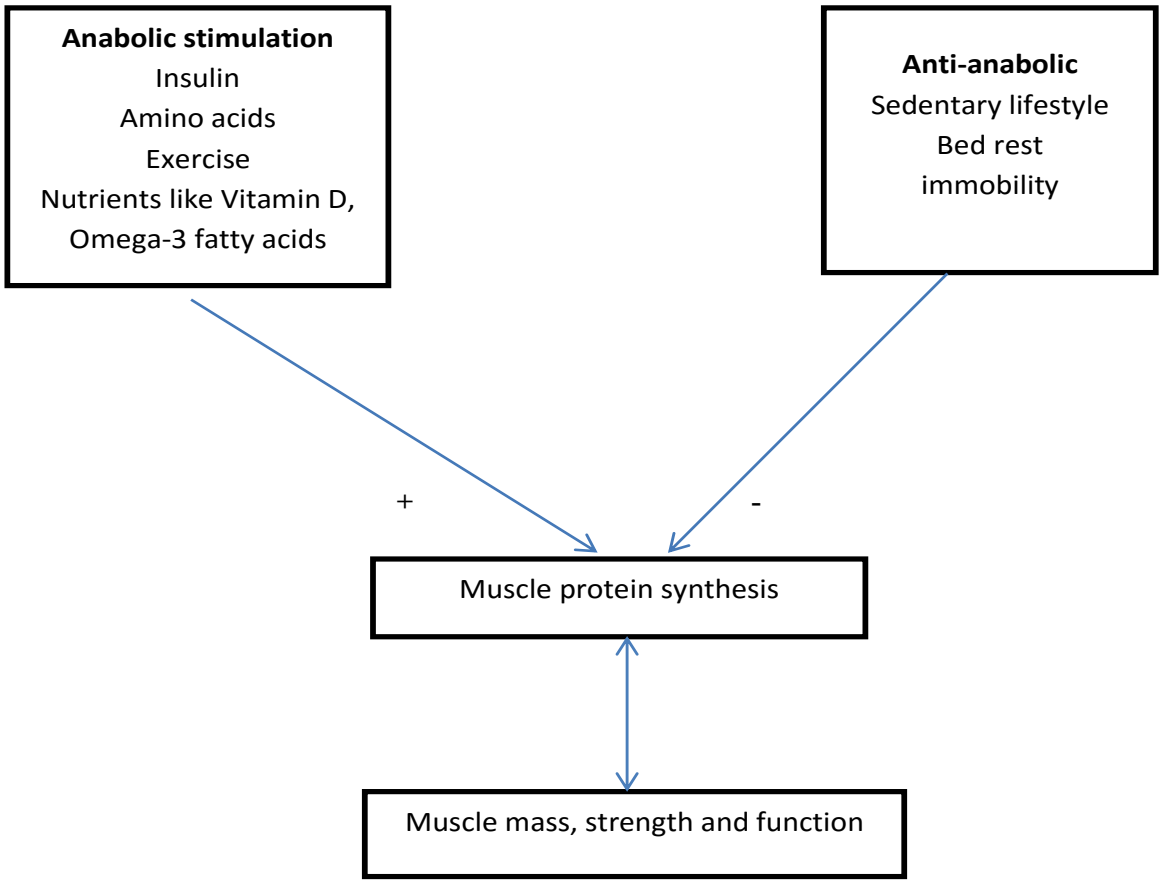
The criteria for the diagnosis of sarcopenia are listed in Table 2. Sarcopenia is considered primary when there are no other causes except aging itself. Secondary sarcopenia may be due to physical inactivity, chronic diseases, altered muscle metabolism or poor nutrition. In the elderly, the causes of sarcopenia are often multifactorial [20].

Some elderly people have evidence of muscle loss together with a higher than gender specific cut-off for percentage body fat. These individuals may be classified as sarcopenic-obese. Their BMI may be normal or even increased [21].

As we age, fat mass increases and peak at age 60-75, with a gradual decline in muscle mass and strength from around 30 years of age, which accelerates after age 60. The factors leading to this change include the loss of anabolic growth factors (associated with physical inactivity), hormonal changes such as decrease in circulating estrogen and testosterone, malnutrition and catabolic causes like pro-inflammatory states. The distribution of visceral and intramuscular fat increases with aging, while the proportion of subcutaneous fat decreases [22, 23]. There is a corresponding decrease in basal metabolic rate and energy expenditure with aging, due to the loss of lean muscle mass and general physical inactivity, leading to gain in fat mass and body weight. Increased body fat is associated with insulin resistance, which predisposes to metabolic syndrome.

Muscle protein synthesis reduces with age, contributing to sarcopenia. Inactivity induces resistance of muscles to anabolic stimulation.

Figure 2. Association between anabolic factors and muscle mass [24].



Exercise and resistance training stimulates muscle protein synthesis by vasodilatation and nutrient delivery to muscles and partly due to improved insulin sensitivity (Figure 2).

Aging muscles do respond to exercise, especially resistance training. Physical activities during a person's lifespan are important to prevent muscle deconditioning, maintain a good quality of life both mentally and physically, maintain cognitive function and reduce depressive symptoms. The PROT-AGE group recommends endurance as well as resistance type exercises as tolerated by the individual [24-26].

Optimal protein intake

Low protein intake among the elderly predisposes to muscle loss and osteoporosis. Dietary protein intake stimulates muscle protein synthesis which leads to improvement in lean muscle mass, strength, and function among the elderly [27]. Increasing dietary protein has also been shown to improve bone mineral density of the femoral neck, reduces fracture risks and improves total body calcium [28].

The protein sources from animal protein and dairy products are considered higher quality proteins in terms of the higher proportion of essential amino acids useful for muscle protein synthesis as compared to vegetable sources of proteins. The daily intake of carbohydrate and fat should both be kept low since both could contribute to Type II Diabetes [29,30].

The Food and Nutrition Board recommends a daily protein intake of 0.8g/kg/day of protein for all adults including the elderly. This is the minimum amount of protein required daily to prevent a loss of lean body mass. Protein intake should constitute 10-35% of the daily energy intake.

Protein consumption generally declines with age in both men and women. The factors contributing to this may be cost, difficulties with food preparation, chewing and swallowing [30,31].

Among the elderly, the minimal amount of dietary protein recommended above may still be associated with loss of lean body mass, especially in the presence of chronic inflammatory disorders and hospitalizations. Concerns regarding renal function, cancer, cardiovascular health for elderly with high protein diets remain unproven.

The PROT-AGE [25] study group recommends a daily protein intake of 1-1.2g/kg/day in order to maintain lean body mass. A higher intake of >1.2g/kg/day is recommended for those who exercise. For the elderly with acute or chronic illnesses, 1.2-1.5g/kg/day is recommended to maintain muscle mass. In the presence of hypercatabolic states, wounds, and muscle wasting, the daily requirement may be even higher [22,26]. Among the elderly with severe injury or illnesses or marked under-nutrition, they may need up to 2g/kg/day, provided they do not have severe renal failure without the support of dialysis therapy (GFR <30ml/min/1.73m^2) [22, 31].

Management of Protein Energy Malnutrition (PEM) in the elderly

The management of PEM includes strategies to improve nutritional intake with enteral nutrition and parenteral nutrition. Enteral nutrition is defined as all forms of nutritional support which use dietary foods for special medical purposes, which includes food fortification, oral nutritional supplement, and tube feeding. (32) The goal of dietary intervention is not only to increase and maintain overall energy, protein and micronutrient consumption but also to prevent further decline in physical function and muscle loss. Enteral nutrition, which includes oral nutritional supplement (ONS) and tube feeding, has been shown to increase overall energy and nutrient intake resulting in weight gain, and increase in fat-free mass, body cell mass and serum albumin in elderly with poor voluntary food intake, with support and encouragement from care staff, variety in flavor and feeding in between meal times. [30]

Each older person will have a unique physiological, psychosocial and disease profile. We, therefore, have to consider each patient's choice, eating habits, nature of the underlying medical conditions, prognosis, culture and values in planning a dietary intervention [19] Although there is limited evidence to support the use of dietary counseling, fortified snacks, and supplements to manage undernutrition, many of these studies were small and the follow-up duration too short, to be conclusive [32].

High energy and/or high protein oral nutritional supplements (ONS) come in different forms (liquid, cream, powder, etc), types (milk based, juices, desserts, etc), flavors, with or without lactose. ONS are usually recommended if dietary advice is ineffective or severe under-nutrition is present from the onset [6,33,34]. ONS provides a balance of macronutrients (protein, carbohydrate and fat) and micronutrients (vitamins, trace elements, and minerals). Most are energy dense (1.0kcal/ml to 2.4kcal/ml), with each serving providing about 300kcal. In a meta-analysis, Stratton showed that ONS reduced mortality by 30% among the sick hospitalized elderly [35]. ONS have been shown to improve functional measures of muscle strength, walking distance, immunity, quality of life and activities of daily living among the undernourished older people in the community and in hospitals. For the chronically ill, Stratton also showed functional improvement among the underweight elderly patients (BMI<20kg/m^2) who gained >2kg in weight [35,36]. Nutritional supplements have been shown to reduce pressure sores among the critically ill elderly, with cumulative incidence of 40.6% in the intervention group Vs 47.2% in the control group. The intervention group had higher energy and protein intake [37]. For treatment of pressure ulcers, very high protein tube feeding regime (25% of total energy as

protein) resulted in greater reduction in ulcer area, over eight weeks compared to tube fed elderly on high protein feed (16% of energy as protein). Supplements containing zinc, vitamin C, and arginine were also associated with better ulcer healing compared to a standard hospital diet or diet without supplement [38].

However, the success of nutritional supplement may be limited by poor compliance, poor palatability, and cost. Nutritional supplements are indicated for frail elderly patients with under-nutrition, severe neurological causes of dysphagia, elderly undergoing hip fracture surgery, elderly who are depressed with anorexia and elderly at risk of developing pressure ulcers [33-35]. However, controversies arise among elderly with severe dementia, cancer and elderly with recurrent aspiration pneumonia [31]. In the setting of acute illnesses and hospitalization, a higher proportion of protein is needed for exudative fluid losses, catabolic state, wound healing and to Replete body stores. A higher protein intake among hospitalized elderly has been associated with reduced pressure sore development, fewer complications, and mortality among those under-nourished at baseline [31,39]. Often, the standard hospital diet does not have adequate protein to meet these higher requirements; thus highlighting the important role dietitians play in the management of malnutrition in the elderly [39].

Micronutrient needs of the elderly

Although energy requirements may decline with age, the requirements for micronutrients remains unchanged and older people also need food rich in such nutrients. (40) Some of the common vitamins and trace elements deficiencies are discussed below. The Recommended Daily Allowance (RDA) for the various micronutrients are listed in Table 3 [41].

Table 3. Dietary recommendations for vitamins and trace elements [40].

Micronutrients	Men >50y	Women >50y
Vitamin A	900µg/day	700µg/day
Vitamin B_{12}	2.4µg/day	2.4µg/day
Folic acid	400µg/day	400µg/day
Vitamin D	600-800IU/day	600-800IU/day
Iron	8mg/day	8mg/day
Calcium	1200mg/day	1200mg/day

Vitamin A

Vitamin A is important for vision, especially for sensing low light, tears production (and clearing debris) and lymphocyte proliferation. Low plasma retinol levels have also been shown to be related to cardiovascular diseases [42]. Low Vitamin A intake is often coincident with a diet low in protein. Its absorption is fat dependent. Vitamin A is bound to retinal binding protein, synthesized by the liver which is also dependent on dietary protein. Dietary sources of Vitamin A include green leafy vegetables, carrots, squash, eggs, beef liver and fortified foods [43].

Vitamin B_{12}/cobalamin

Vitamin B_{12} deficiency has been associated with depression, psychosis, sub-acute combined degeneration of the cord, dementia, and multiple sclerosis. The neurological complications are potentially irreversible. Common causes of vitamin B_{12} deficiency include pernicious anemia, poor intake, atrophic gastritis, pancreatic insufficiency and ileal diseases. The prevalence of vitamin B12 deficiency has been reported to be >20% among the elderly in developed countries [44]. Sources of Vitamin B_{12} include meat, fish, poultry, eggs and fortified cereals.

Folic acid

Folic acid is important in DNA syntheses and amino acid metabolism. Deficiency causes anemia and diarrhea. The sources of folate include green leafy vegetables, fruits, nuts, beans, peas, dairy products, eggs, seafood, poultry, meat and fortified foods like bread, cereal and pasta [41,42].

Vitamin D

Vitamin D is either ingested or synthesized in the skin after exposure to sunlight or artificial ultraviolet light. Subsequently, it is hydroxylated in the liver and kidneys to become biologically active. Its main function is to maintain calcium and phosphorous levels; prevent osteomalacia, promote growth and proliferation of hemopoietic and immune cell lines. Low vitamin D levels have been associated with risks of falls, osteoporosis, fractures, sepsis, cardiovascular diseases, metabolic disorders cancers and poorer cognitive function [45]. A low Vitamin D level is also associated with elevated serum Parathyroid hormone (PTH) level which increases bone turnover and the elevation of serum alkaline phosphatase levels.

Vitamin D deficiency is common worldwide among the older people, especially among the institutionalized elderly. Food is a source of Vitamin D, which is mainly found in fatty fish like salmon, tuna, mackerel, egg yolks and cod liver oil. In general, foods fortified with Vitamin D such as milk provide the bulk of dietary Vitamin D.

The main source of Vitamin D comes from skin synthesis which is also reduced in the aging skin. Supplementation of 800IU a day together with calcium improves bone mineral density and reduces falls and fracture risks [46].

Calcium

Calcium with adequate Vitamin D plays an important role in the prevention of osteoporosis and fragility fractures. Osteo-

porosis is a silent disease with fragility fractures as its most serious complications, resulting in mortality, loss of independence, functional decline, increased falls risk and chronic pain. Other functions of calcium include nerve conduction, muscle contraction, hormone secretion and enzyme activation. The American Society for Bone and Mineral Research recommends calcium and vitamin D supplementation although the preferred source of calcium should be from dietary source, in light of calcium supplement being linked to increased cardiovascular mortality. Calcium supplementation is recommended for those whose oral intake remains insufficient [46]. The main sources of calcium are dairy products, dried beans, kale, fortified juices, tofu, and spinach.

Iron

The most important role of iron is in oxygen transportation to tissues through hemoglobin and myoglobin. Iron stores also affect immunity, cognition, and muscle function. Iron deficiency anemia is the commonest cause of nutrition-related anemia among the institutionalized or chronically ill elderly. Sources of iron include the heme iron from animal sources like beef, pork, poultry and fish and the non-heme source from beans, dried fruits, enriched grains and fortified cereals. Non-heme iron needs to be in a soluble form for absorption and this is often reduced among the elderly, especially those with atrophic gastritis [41,42].

Tube feeding in the elderly

Tube feeding (TF) can benefit patients with nutritional deficits. This is particularly true for older people when nutrition is compromised. Elderly patients with dysphagia, stroke or dementia may require TF. Dysphagia affects up to 30% of elderly patients admitted to the hospital, [46] up to 64% of patients after a stroke,[47] and 13% to 38% of the elderly population who live independently [48]. When it becomes difficult for elderly patients to meet their nutritional demands orally, these patients, their family caregivers, and the healthcare team may consider the option of TF.

The two most commonly used feeding tubes are nasogastric (NG) and percutaneous entero-gastrostomy (PEG) tubes. Ideally, NG feeding tubes should be for short-term use in patients who are expected to recover. PEG feeding can be considered if the patient's nutritional intake is likely to be inadequate for a period of 4 weeks or more [49].

The elderly with neurological dysphagia

In elderly patients with neurological dysphagia, TF is recommended in order to maintain or improve the nutritional status. Patients with acute stroke and dysphagia with poor nutritional status on hospital admission may have a negative impact on clinical outcomes [50]. Studies on the role of early TF after acute cerebrovascular events have shown that early TF is feasible in elderly patients, [51, 52] with a positive impact on survival [53] and length of hospital stay [50]. In a retrospective analysis of stroke patients above 65 years of age, the group receiving TF within 72 hours after the cerebrovascular event had a reduced hospital length of stay (LOS) compared to those receiving TF after 72 hours [51]. Taylor [52] found that patients who were without nutrients for less than 5 days had a lower mortality than those who were without nutrition for more than 5 days. Interestingly, this difference in mortality was statistically significant in older patients aged 65 years and above. Furthermore, the FOOD trial suggested that in the first 2-3 weeks after an acute stroke, better functional outcomes result from feeding via NG tube than PEG tube [53]. In a Cochrane analysis of interventions for dysphagia in acute stroke, PEG feeding is superior to NG tube feeding as it is associated with fewer treatment failures and better nutritional status [54]. In the study by Norton et al. [55] mortality after 6 weeks was significantly lower in the PEG group than the group fed by NG tube (12% vs 57%), which supports the hypothesis that PEG fed patients may receive more of their prescribed feeds and show a greater improvement in nutritional state. In addition, PEG feeding has a higher subjective and social acceptance, being less stigmatizing.

The frail elderly with malnutrition

Frail elderly patients often suffer from multiple co-morbidities which impair their independence and are at high risk of malnutrition and its serious consequences. Often TF is initiated when severe malnutrition has already developed, which makes it difficult for nutritional support to be effective. However, several studies have shown maintenance or improvement of nutritional parameters in malnourished elderly patients with TF [56-58]. TF may benefit frail elderly patients who are at nutritional risk as long as their general condition is stable. Observational studies indicate a relatively good prognosis in tube-fed frail elderly nursing home residents with good health status [59,60]. Bastow et al [61] demonstrated clear improvements in "very thin" elderly patients with neck or femoral fracture given supplementary overnight tube feeding. This group of severely malnourished patients had the greatest benefit from TF.

Clinical experience shows that TF if initiated early to the malnourished or those at nutritional risk including the frail but stable patients, may be beneficial. Along with rehabilitation, TF can help to maintain muscle mass in this population.

The elderly with dementia

Inadequate oral intake is a common problem in elderly patients with dementia. Rudberg et al [62] described a lower mortality at 30 days and 1 year in enterally fed patients with severe cognitive impairment as compared to controls. Furthermore,

there are very low mortality rates reported in PEG-fed nursing home residents with dementia [58,59]. While TF can provide a direct benefit in many clinical situations, it does not benefit elderly patients with advanced dementia. Finucane et al [63] found no strong evidence to suggest that TF prevented aspiration pneumonia, prolonged survival, improved wound healing, or reduced infections. Various studies have confirmed that PEG tube insertion in elderly patients with advanced dementia does not affect survival nor does it prevent or improve healing of pressure ulcers in this population. Patients with advanced dementia who had a feeding tube inserted during an acute care hospitalization were at higher risk of developing pressure ulcers [64-67]. Research findings have shown increased mortality in elderly patients with severe dementia with PEG-tubes. Two-thirds of these elderly patients had their PEG-tubes placed during an acute care hospitalization [68,69]. Feeding tube placement in nursing home residents with advanced dementia often result in burdensome transitions to hospitals for evaluation of emergent complications [60,68,70]. Abuksis G et al [71] demonstrated that such patients who are hospitalized with an acute illness and have their PEG-tubes inserted are at high risk of serious adverse events after PEG insertion. Some researchers have proposed a 'cooling' period or a waiting period as a strategy to prevent early deaths [72,73]. During this waiting period, the patient can be fed via NG tube [73]. Studies have failed to demonstrate the survival benefits of TF in the older population. Since TF is often used in ill elderly populations, 30-day mortality following placement of a feeding tube averages 18-28%, and 1-year mortality is approximately 50%, with reports ranging from 39% to 90% for patients with dementia. [63, 68, 74]. This finding indicates that patient characteristics, complications, and the likelihood of survival should be taken into account when feeding tube placement is considered.

The elderly who is aspirating

TF is intended to reduce aspiration pneumonia (AP), which is common in the elderly population who are dysphagia or feeding inadequately. The risk of AP is one of the most frequent cited reasons by healthcare teams for starting TF in the older patients [74]. Placement of NG tube weakens the ability of the lower oesophagal sphincter to prevent gastro-oesophageal reflux [75]. Studies have revealed that patients with feeding tubes are still at risk of aspiration and the development of aspiration pneumonia [76,77]. Clinicians may believe PEG feeding to be better than NG tube feeding in preventing AP. However, there is little evidence to support any advantage of the former in AP prevention. A review comparing NG tube feeding with PEG feeding could not find any difference in mortality and pneumonia between the two groups [78]. Studies have also failed to show any differences in AP between patients receiving continuous pump feeding and those receiving intermittent feeding [79]. Continuous pump feeding has a higher operating cost than intermittent feeding. The risk of aspiration and development of pneumonia can be reduced by elevation of the patient's head to 30 to 45 degrees during feeding and frequent assessment of NG tube placement as they can become dislodged. Patients receiving gastric feeding should be assessed for gastrointestinal intolerance. Gastric residual volumes should be measured every 4 to 6 hours during continuous feeding or immediately before each intermittent feeding [80, 81].

Quality of life

The quality of life is crucial in the evaluation of the therapeutic benefits of TF in the elderly. However, in patients who require TF, cognitive impairment can make the assessing quality of life difficult. Callahan et al [82] reported about 60 % were unable to communicate at the time of PEG placement, and the majority had impaired cognitive function. Tube feeding has side effects that may adversely affect the quality of life. Bereaved family members report that nearly 40% of patients dying with dementia were bothered by their feeding tube, 26% were physically restrained, and 29% were restrained with pharmacological treatment [83].

Shared decision

When considering feeding options, families should consider not only their loved one's medical information, but also ethical, religious, and cultural factor [84, 85]. Nutrition is fundamental to survival and when the consideration not to initiate TF is discussed with families, this is often wrongly interpreted as an option that will mean "no food or care" for their loved ones. This assumption results in their reluctance to take this option. Physicians may also be more optimistic about TF outcomes than is supported by evidence, which can influence this choice [86].

Caregivers need to be educated on ways to maintain the quality of life with oral feeding, which translates to the continual feeding of patients by mouth, with the safest diet and strict aspiration precautions in place, so they may still enjoy the taste of food.

Clinical guidelines and decision aids have assisted healthcare providers, patients, and caregivers in the decision-making process associated with feeding tube placement in patients with advanced dementia. They have been shown to improve decision-making about feeding options in dementia care [87,88]. They often involve a comprehensive assessment looking for reversible causes of inadequate nutrition, and if tube feeding is initiated, specific goals and time intervals are established for reviewing whether these goals have been achieved [83].

Conclusion

In our aging society, more people have physical limitations or dementia that curtails their ability to eat independently. The

risk of poor nutrition and its associated poor outcome are well documented. Early identification of elderly at risk of poor nutrition allows for intervention strategies to reduce further weight loss and lean muscle loss. In addition, nutritional support reduces mortality and morbidity. Healthcare providers and caregivers are often pressured into initiating TF as the only feasible option. Outcome and the success of TF in the elderly patients are strongly influenced by the severity of their illness, their co-morbidities, and their general condition. There is little evidence in the existing literature to suggest long-term survival rates and quality of life are improved in elderly populations especially those with advanced dementia who received TF. However, the relevance of quality of life, need for nutrition and hydration, and ethical considerations are complex and controversial issues that war¬rant further study prior to achieving consensus and formal¬izing clinical care guide

Footnotes

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