Available online: https://journal.ipb.ac.id/index.php/jgizipangan ***J. Gizi Pangan, September 2025, 20(Supp.1):37-42***
Accredited based on DGHE, Republic of Indonesia 79/E/KPT/2023
ISSN 1978-1059 EISSN 2407-0920

Challenges in Managing Malnutrition in a Geriatric Patient: A Case Study

Ahmad Huzaifah bin Usoh@Yusoff[1], Nurul Izzah binti Nordin[1], Nazrul Hadi bin Ismail[1,3*], Muhammad Ariff Abdul Rahman[2]

[1]Centre for Dietetics Studies, Faculty of Health Sciences, Universiti Teknologi MARA, 42300 Puncak Alam, Selangor, Malaysia
[2]Department of Nutrition and Dietetics, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 42300 Puncak Alam, Selangor, Malaysia
[3]Intergrated Nutrition Science and Therapy Research Group (INSPiRE), Faculty of Health Sciences, Universiti Teknologi MARA, 42300 Puncak Alam, Selangor, Malaysia

ABSTRACT

This case study aims to report on the nutrition management of low appetite in elderly due to age factor and underlying medical conditions. Mr. A, a 71-year-old Malay gentleman was referred to a dietitian at the medical ward with a diagnosis of hyperleukocytosis with Mean Corpuscular Hemoglobin Concentration (MCHC) anemia and hypercalcemia with underlying Diabetes Mellitus (DM), hypertension, and Chronic Kidney Disease (CKD) 3A. His weight and height were 59.5 kg and 159 cm, with a Body Mass Index (BMI) of 23.5 kg/m^2. He claimed has lost 10 kg within 5 months. Biochemical data showed low albumin, hemoglobin, and magnesium. Intake was 69% adequacy for 24 hours of diet recall in the hospital. As for nutrition diagnosis, inadequate protein-energy intake related to decreased ability to consume sufficient energy due to lethargy as evidenced by loss of appetite and total energy intake (1,244 kcal) and protein (51.8 g) lower than recommendation (energy: 1,606 kcal, protein: 59.5–71.4 g) were reported. The nutritional intervention aimed to encourage orally as tolerated, giving oral nutrition supplements, a palatable diet, and increasing the energy and protein intake by cutting the food into smaller pieces. As the progress of the intervention, patient's calorie intake was increased up to 99% of the requirement. His weight on the second follow-up was 62.2 kg, increased by 2.7 kg in 10 days. However, the protein intake was still low, and the intervention was to add protein modular. As conclusion, malnutrition is common among the elderly due to decreased ability to consume sufficient energy and protein due to aging factors.

Keywords: calorie, elderly, malnutrition, protein

INTRODUCTION

Malnutrition is characterized as a condition brought on by a lack of nutrition intake or uptake that results in changed body composition such as reduced fat-free mass and body cell mass, which in turn affects physical and mental function and the clinical course of disease (Correia *et al.* 2017). Malnutrition does not solely happen to the elderly especially those who are age more than 60 years old who suffer from hunger or who do not have access to healthy food. In general, malnutrition is linked to higher rates of morbidity and mortality in both acute and chronic diseases, and it has detrimental effects on clinical outcomes, healing from injuries and illnesses, and surgical recovery (Norman *et al.* 2021). The common challenging part in managing malnutrition among the elderly are limited access to food due to need-assisted feeding and the low-calorie diet pattern due to the aging factor.

Periodically, there is an increasing trend in the prevalence of malnutrition worldwide, particularly in developed nations like the United States (Abd Aziz *et al.* 2017). Meanwhile, in Malaysia, 23.5% of the elderly were at risk of malnutrition and 7.3% of them had already experienced malnutrition (Ahmad *et al.* 2021). Older adults are more likely to have chronic conditions that put them at risk for malnutrition (Haines *et al.* 2020). The elderly with chronic disease, poor quality of life, and polypharmacy are at higher risk for malnutrition (Nakamura *et al.* 2021). Thus, this case study aims to discuss the importance of adequate energy and protein provision to elderly patient through medical nutrition therapy.

[*]**Corresponding Author:** email: nazrul2923@uitm.edu.my
(Received 18-02-2025; Revised 26-05-2025; Accepted 21-08-2025; Published 15-09-2025)

PATHOPHYSIOLOGY

Malnutrition is typically brought on by inadequate calorie intake or a nutrient-poor diet. A rising health concern in our older population is dysphagia (Sura *et al.* 2012). However, malnutrition is often more complex and caused by physical, social, and psychological issues such as dementia, dysgeusia, depression, diarrhea, immune dysfunction, dentition, and nutrition-related diseases. The most common forms of malnutrition seen in the elderly in hospital settings are chronic disease-related nutrition and acute disease-related nutrition. Unintentional loss of body mass (>5% in six months or >10% after six months) or a markedly reduced body mass (Body Mass Index (BMI) 20 kg/m^2) or muscle mass should be considered serious signs of malnutrition requiring investigation into the underlying causes (Volkert *et al.* 2019).

This patient was diagnosed with anemia, bone pain, and hypercalcemia that resulted in weakness, fatigue, loss of appetite, and unintentional weight loss. The signs and symptoms of malnutrition can be seen if the patient has weight loss, low dietary intake, gastrointestinal symptoms (nausea, vomiting, diarrhea), loss of functional ability, muscle wastage, disease state affecting nutritional requirements, fat depletion, and edema.

PATIENT'S PROFILE

A 71-year-old Malay gentleman was referred to a dietitian at the medical ward with semi-dependent Activities of Daily Living (ADL). He had been diagnosed with hyperleukocytosis with Mean Corpuscular Hemoglobin Concentration (MCHC) anemia and hypercalcemia with underlying Diabetes Mellitus (DM), hypertension, Chronic Kidney Disease (CKD 3A), and bilateral knee osteoarthritis. He was also under investigation for to rule out for malignancy and multiple myeloma. As for social and medical history, he was ex-army, lived with his wife and grandchildren, and has no family history of malignancy.

NUTRITION ASSESSMENT

Anthropometry data. For anthropometry assessment, the patient's weight and height are 59.5 kg and 159 cm, with a BMI of 23.5 kg/m^2 which is underweight for the elderly. He claimed he had lost 10 kg within 5 months which is considered a significant weight loss (14% loss in less than 6 months).

Biochemical data, medical tests and procedures. As for biochemical data, the result showed low albumin (22 mmol/L), low hemoglobin (10 g/L), low magnesium (0.6 µml/L), high HbA1c (6.7%), high white blood cell (27.37 g/L), high calcium (2.5 µml/L), and high C-Reactive Protein (CRP) 45.

Nutrition-focused physical findings. For nutrition-focused physical findings, all parameters were normal as blood pressure was 139/83 mmHg, heart rate was 86 beat-per-minute (bpm), temperature was 36.7°C, and SpO2 was 99% under room air. Intake-output was recorded at 2,171/1,450. The overall finding was bilateral knee pain, low appetite, and lethargy. A 7-point subjective global assessment was performed by dietitian, and the score was 3, indicating mildly to moderate malnourishment. The patient also complained that he had swallowing difficulties.

Food nutrition-related history. For food nutrition-related history, a 24-hour diet recall for hospital intake and multiple past diet recalls for home intake were taken. At the hospital, the patient received a diabetic diet, a low-salt diet, and a low-fat diet. The total intake at the hospital was 1,244 kcal (69% adequacy of total energy requirement), and protein intake was 51.8 g (0.8 g/kg). Meanwhile, the patient lost appetite at home for two weeks and had a very minimal intake of 345 kcal (21% adequacy) for energy and 11 g (0.2 g/kg body weight) for protein.

As for overall nutrition-related history, the patient did not have any allergies to food or drugs. However, during hospitalization, he needs assisted feeding by a caretaker due to body weakness and lethargy.

Energy requirement for the patient was calculated using the quick method for elderly in hospital (ESPEN 2018), 27–30 kcal/kg, which is 1,606–1,785 kcal/day, while protein was calculated using the formula for CKD and elderly, 1.0–1.1 g/kg which is 59.5–65.5 g/day.

NUTRITION DIAGNOSIS

Inadequate protein-energy intake related to decreased ability to consume sufficient energy

due to lethargy as evidenced by loss of appetite and total energy intake (1,244 kcal) and protein (51.8 g) lower than recommendation (energy: 1,606 kcal, protein: 59.5–71.4 g).

NUTRITION INTERVENTION

The main goal for this patient was to achieve adequate energy and protein intake and to prevent weight loss. The nutritional intervention aimed to encourage oral intake as tolerated, giving oral nutrition supplements, a palatable diet, and increasing the protein intake by cutting it into smaller pieces. The plan was to continue the indent of a diabetic diet which contain 1,800 kcal of calories, 60 g of protein and 50% of carbohydrate. Then, as additional, the patient had been supplemented with Oral Nutrition Supplement (ONS) which is one bottle of Nutren Diabetik Plus RTD per day.

NUTRITION MONITORING & EVALUATION

The patient had been follow-up for two times. His calorie intake was increased up to 99% of the requirement. His weight on the second follow-up was 62.2 kg, which increased by 2.7 kg (4.5% increment) in 10 days. The previous nutrition diagnosis was resolved. However, the protein intake was still low which was 0.7 g/kg body weight during the first follow-up and 0.8 g/kg body weight during the second follow-up. Hence, the intervention was to add protein modular, which was one bottle of Protegen per day. Therefore, the new nutrition diagnosis was inadequate protein intake related to limited food acceptance (protein), as evidenced by a total protein intake (50 g) lower than the recommendation (62.2–74.6 g).

DISCUSSION

Malnutrition is a severe problem that must be addressed early using weight profiles and mini nutritional assessment questionnaires. From these assessments, protein and energy needs were increasing, considering the patient's condition. Identifying clinical problems linked to malnutrition is simple and reliable when using validated nutritional screening techniques (Flanagan *et al.* 2012). Thus, in this case, the 7-point Subjective Global Assessment (SGA) was used as a tool for malnutrition screening. The utility of combining anthropometric data with validated tools like the 7-point SGA and MNA is widely accepted in clinical nutrition practice. These tools not only facilitate early diagnosis but also allow for monitoring the progression of nutritional status over time. According to Rasheed and Woods (2013), early screening using MNA-SF in older patients improves care outcomes andcan reduce the risk of complications such as infections, pressure ulcers, and delayed rehabilitation. Morover, early identification allows for timely nutritional interventions that are critical in preventing further deterioration, especially in hospitalized or long-term care patients.

According to Gaillard *et al.* (2007), it is estimated that sick elderly people need between 27 and 30 kcal/kg of calories at a minimum. Based on these data, an approximate estimate and general guideline for older people's energy needs of roughly 30 kcal/kg Body Weight (BW) is recommended. This guiding principle, however, requires individual adjustment concerning all pertinent aspects. The control of adequate energy intake requires careful monitoring of body weight (Cederholm *et al.* 2022). In clinial settings, energy requirments must consider the degree of inflammation, activity level, organ function, and the presence of catabolic conditions. The ESPEN guidelines (Volkert *et al.* 2019) suggest that in frail or ill older adults, energy intake may need to exceed 30 kcal/kgBW, especially when there is tissue breakdown, such as in pressure ulcers or sepsis. Regular monitoring of weight treds, fluid status, and functional putcomes (e.g., handgrip strenght) are essential parameters in evaluating the adequacy of energy intake over time. For protein requirement, a study by Bauer *et al.* in 2013 suggested that the daily amounts of 1.0–1.2 g/kg body weight for healthy older persons. Even though the patient has sepsis, an extended stay in the hospital, muscle loss, a low level of albumin, and total protein, more than 1.2 g/kg was not prescribed as the patient has Chronic Kidney Disease (CKD) stage 3A and adequate as his renal profile, which is urea and creatinine was in the normal range. Another diet modification for this patient was adding one hard-boiled egg for breakfast as a protein source, as the patient's preference, and this is supported by a study from

Puglisi and Fernandez (2022), who reported that Egg protein may help to enhance skeletal muscle function and avoid sarcopenia in elderly people by lowering muscle protein breakdown in addition to promoting muscle protein synthesis. In a study by Kim *et al.* (2018) due to a more notable decrease in muscle protein degradation, total nitrogen balance improved more following an egg breakfast. Integrating patient food preferences into medical nutrition therapy can significantly improve compliance and outcomes. Eggs are not only high-quality protein sources but also contain micronutrients beneficial for aging adults, such as vitamin D, cholinre, and lutein. A study by Blesson and Fernandez (2018) highlighted that egg consumption can also support metabolic health, improve satiety, and help in glycemic control-benefits particulary relevant to diabetic e;dery patients. When dietary intervensions align with taste preferences, nutritional goals are more likely to be met sustainably.

When dietary counseling and food fortification are insufficient to boost dietary intake and attain nutritional objectives for older people who are malnourished or at risk of developing chronic diseases, Oral Nutritional Supplements (ONS) must be provided (Cederholm *et al.* 2022). More significant weight gain, higher energy and protein intake, and better quality of life are reported when given ONS (Parson 2017). For this case, the ONS was added to provide adequate protein and energy, considering the patient's diet intake. The diabetic-specific formula was chosen considering the patient has Diabetes Mellitus (DM), and protein modular was prescribed to boost protein as the patient's protein intake was very low. ONS is a well-established adjunct in treating malnutrition, particulary when oral intake is inadequate, or restricted. In diabetic patients, specialized formulas are designed with a lower glycemic index, controlled carbohydrate content, and added fiber, making them suitable for glycemic management (Stratton *et al.* 2018). Modular protein powders, when used with ONS, allow for individualized protein dosing without excessive caloric or fluid burden. Regular review of tolerance, compliance and metabolic parameters is necessary to ensure safety and effectiveness of ONS therapy.

Therapeutic dietary limitations should be removed from geriatric diets, especially if they have a decreased appetite and unintended weight loss. A diabetic diet was prescribed, and a low sodium diet was excluded to increase palatable for the patient. Besides, a small cut for protein and vegetables was provided as the patient claimed to have difficulty chewing. This modification is supported by a study from Wirth *et al.* (2016) said that texture modification can also make the swallowing process slower and thereby safer.

Relaxing dietary restrictions in malnourished older adults is increasingly encouraged to prioritize quality of life and nutritional adequacy over rigid disease-based diets. According to the American Geriatrics Society (GSA) (2014), overly restrictive diets can lead to food aversion, further reduce intake, and contirbute to frailty. Texture-modified diets not only facilitate swallowing but also reduce the risk of aspiration pneumonia (Cichero *et al.* 2013). Involving speech-language pathologists in dysphagia assessment can further personalize food texture and ensure swallowing safety.

CONCLUSION

The risk of malnutrition rises with age and care level. Sarcopenia, or age-related muscle atrophy, is more noticeable in later life and may go undetected due to excess body fat (Agarwal *et al.* 2013). MNT provision has achieved the clinical targets for weight. The energy intake was attained, and the weight was increased to 2.7 kg. The patient had received an adequate energy intake of 1,600 in 10 days of hospitalization. The patient was improved in terms of weight and dietary intake showing that the intervention done was successful.

CONSENT

Verbal consent was obtained from the patient.

ACKNOWLEDGEMENT

Special acknowledgement to everyone who took part in this case study.

DECLARATION OF CONFLICT OF INTEREST

There is no competing interest among the authors.

REFERENCES

Ahmad MH, Salleh R, Siew Man CS, Pardi M, Rahim NCA, Shahril N, Mutalib MHA, Shahar S, Ahmad NA. 2021. Malnutrition among the elderly in Malaysia and its associated factors: Findings from the National Health and Morbidity Survey 2018. J Nutr Metab 2021:1–8. https://doi.org/10.1155/2021/6639935

Agarwal E, Miller M, Yaxley A, Isenring E. 2013. Malnutrition in the elderly: A narrative review. Maturitas 76(4):296–302. https://doi.org/10.1016/j.maturitas.2013.07.013

Abd Aziz NAS, Teng NIMF, Abdul Hamid MR, Ismail N. 2017. Assessing the nutritional status of hospitalized elderly. Clin Interv Aging 12:1615–1625. https://doi.org/10.2147/cia.s140859

Bauer J, Biolo G, Cederholm T, Cesari M, Cruz-Jentoft AJ, Morley JE, Phillips S, Sieber C, Stehle P *et al.* 2013. Evidence-based recommendations for optimal dietary protein intake in older people: A position paper from the prot-age study group. J Am Med Dir Assoc 14(8):542–559. https://doi.org/10.1016/j.jamda.2013.05.021

Blesso CN, Fernandez ML. 2018. Dietary cholesterol, serum lipids, and heart disease: Are eggs working for aginst you? Nutr 10(4):426. https://doi.org/10.3390/nu10040426

Cederholm T, Barazzoni R, Austin P, Ballmer P, Biolo G, Bischoff SC, Compher C, Correia I, Higashiguchi T, Holst M *et al.* 2017. Espen guidelines on definitions and terminology of clinical nutrition. Clin Nutr 36(1):49–64. https://doi.org/10.1016/j.clnu.2016.09.004

Cichero JAY, Lamp P, Steele CM, Hansin B, Chen J, Dantas R, Duivestein J, Kayashita J, Lecko C, Murray J *et al.* 2013. Development of international terminology and definitions for texture-modified foods and thickened fluids used in dysphagia management: The IDDSI framework. Dysphagia 28(2):181–195. https://doi.org/10.1007/s00455-013-9458-8

Cleveland Clinic. 2022. Multiple myeloma. https://my.clevelandclinic.org/health/articles/6178-multiple-myeloma [Acessed 25th July 2023].

Deutz NE, Matheson EM, Matarese LE, Luo M, Baggs GE, Nelson JL, Hegazi RA, Tappenden KA, Ziegler TR. 2016. Readmission and mortality in malnourished, older, hospitalized adults treated with a specialized oral nutritional supplement: A randomized clinical trial. Clin Nutr 35(1):18–26. https://doi.org/10.1016/j.clnu.2015.12.010

Flanagan D, Fisher T, Murray MG, Visvanathan R, Charlton KE, Thesing C, Quigley G, Walther K. 2012. Managing undernutrition in the elderly - prevention is better than cure. PubMed 41(9):695–699. https://pubmed.ncbi.nlm.nih.gov/22962646

Gaillard C, Alix E, Sallé A, Berrut G, Ritz P. 2007. Energy requirements in frail elderly people: A review of the literature. Clin Nutr 26(1):16–24. https://doi.org/10.1016/j.clnu.2006.08.003

Haines J, LeVan D, Roth-Kauffman MM. 2020. Malnutrition in the elderly: Underrecognized and increasing in prevalence. https://www.clinicaladvisor.com/home/topics/geriatrics-information-center/malnutrition-in-the-elderly-underrecognized-and-increasing-in-prevalence/ [Acessed 30th June 2023]

Kim IY, Shin YA, Schutzler SE, Azhar G, Wolfe RR, Ferrando AA. 2018. Quality of meal protein determines anabolic response in older adults. Clin Nutr 37(6):2076–2083. https://doi.org/10.1016/j.clnu.2017.09.025

Nakamura T, Itoh T, Yabe A, Imai S, Nakamura Y, Mizokami Y, Okouchi Y, Ikeshita A, Kominato H. 2021. Polypharmacy is associated with malnutrition and activities of daily living disability among daycare facility users. Medicine 100(34):e27073. https://doi.org/10.1097/md.0000000000027073

Norman K, Pichard C, Lochs H, Pirlich M. 2008. Prognostic impact of disease-related malnutrition. Clin Nutr 27(1):5–15. https://doi.org/10.1016/j.clnu.2007.10.007

Norman K, Haß U, Pirlich M. 2021. Malnutrition in older adults—recent advances and remaining challenges. Nutrients 13(8):2764. https://doi.org/10.3390/nu13082764

Parsons EL, Stratton RJ, Cawood AL, Smith TR, Elia M. 2017. Oral nutritional supplements

in a randomised trial are more effective than dietary advice at improving quality of life in malnourished care home residents. Clin Nutr 36(1):134–142. https://doi.org/10.1016/j.clnu.2016.01.002

Puglisi MJ, Fernandez ML. 2022. The health benefits of egg protein. Nutrients 14(14):2904. https://doi.org/10.3390/nu14142904

Rasheed S, Woods RT. 2013. Malnutrition and quality of life in older people: A systematic review and meta-analysis. Ageing Res Rev 12(2):561–566. https://doi.org/10.1016/j.arr.2012.11.003

Siddique N, O'Donoghue M, Casey MC, Walsh JB. 2017. Malnutrition in the elderly and its effects on bone health – a review. Clin Nutr ESPEN 21:31–39. https://doi.org/10.1016/j.clnesp.2017.06.001

Stratton RJ, Hebuterne X, Elia M. 2018. A systematic review and meta-analysis of the impact of oral nutritional supplements on glycaemic control in patients with diabetes. Clin Nutr 37(6):1901–1910. https://doi.org/10.1016/j.clnu.2017.08.023

Sura L, Madhavan A, Carnaby G, Crary MA. 2012. Dysphagia in the elderly: management and nutritional considerations. Clin Interv Aging 7:287–298. https://doi.org/10.2147/cia.s23404

Volkert D, Beck AM, Cederholm T, Cruz-Jentoft AJ, Goisser S, Hooper L, Kiesswetter E, Maggio M, Raynaud-Simon A, Sieber C *et al.* 2019. ESPEN guideline on clinical nutrition and hydration in geriatrics. Clin Nutr 38(1):10–47. https://doi.org/10.1016/j.clnu.2018.05.024

Wirth R, Dziewas R, Beck AM, Clave P, Heppner HJ, Langmore S, Leischker A, Martino R, Pluschinski P, Rösler A. 2016. Oropharyngeal dysphagia in older persons-from pathophysiology to adequate intervention: A review and summary of an international expert meeting. Clin Interv Aging 11:189–208. https://doi.org/10.2147/cia.s97481