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Perioperative Challenges in Malnourished Geriatric Patients

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ABSTRACT

Introduction. Malnutrition in the geriatric population increases the incidence of postoperative complications, length of hospital stay, recovery time, and mortality.

Materials and methods.

An analysis of scientific articles published between 2002 and 2025 was conducted to evaluate the impact of preoperative malnutrition on the incidence of perioperative complications.

Results.

Preoperative diagnosis of malnutrition in the geriatric population is a risk factor for perioperative complications. Malnutrition identified using the Geriatric Nutritional Risk Index (GNRI) is associated with an increased incidence of perioperative complications. Additional predictive factors include hypoalbuminemia, weight loss greater than 10% within six months prior to surgery.

Scientific reports also highlight the influence of electrolyte imbalances, such as hyponatremia and hypokalemia, which often accompany malnutrition, on the increased risk of perioperative complications in the elderly.

Malnourished elderly patients exhibit higher incidences of postoperative cognitive dysfunction, pneumonia, and impaired wound healing.

Discussion.

Malnutrition is a significant factor determining the increased risk of perioperative complications in geriatric patients. Individuals with insufficient nutritional status more frequently experience impaired wound healing and surgical site infections. Routine assessment of nutritional status in elderly patients before surgery may facilitate the early identification of those at increased risk of perioperative complications. Such an approach would also enable early nutritional intervention, which could potentially reduce the incidence of complications in this population.

Conclusions.

Identifying malnutrition in geriatric patients and implementing measures to optimize nutritional

status in the preoperative period may reduce the risk of perioperative complications in the elderly population.

Keywords

malnutrition, elderly, perioperative problems, geriatric population, geriatric, population, hypo-albuminemia

INTRODUCTION

The process of aging is associated with numerous negative consequences that can be mitigated through a proper diet and the maintenance of adequate physical activity. Consuming sufficient nutrients allows individuals to maintain a healthy body weight, which is essential for optimal functioning of the human body [1].

According to the European Society for Clinical Nutrition and Metabolism (ESPEN), malnutrition is defined as *“a state resulting from lack of intake or uptake of nutrition that leads to altered body composition (decreased fat free mass) and body cell mass leading to diminished physical and mental function and impaired clinical outcome from disease”* [2].

The prevalence of this condition among hospitalized older adults ranges from 30% to 65% [1].

MATERIALS AND METHODS

Scientific papers published between 2002 and 2025 were analyzed from databases such as PubMed, Dove Press Medical, and Google Scholar, focusing on the topic *“Perioperative*

challenges in malnourished geriatric patients.”

RESULTS

A review of the available literature enables an assessment of the impact of malnutrition on the perioperative outcomes in older adults, as well as the identification of the most common complications and nutritional risk factors.

The analysis indicates that malnutrition in the geriatric population is a major clinical problem, significantly increasing the risk of adverse surgical outcomes.

In recent years, it has been emphasized that the proper identification of malnutrition prior to surgery, combined with nutritional interventions, plays a crucial role in improving prognosis of a patient and shortening the duration of hospitalization [3].

The Geriatric Nutritional Risk Index (GNRI) is one the tools for assessing nutritional status in the elderly. Studies have demonstrated that preoperative diagnosis of malnutrition based on the GNRI indicates an increased risk of postoperative complications.

For instance, in a study of patients over 65 years of age with hip fractures, GNRI-based malnutrition was associated with higher 90-day mortality rates [4].

Similar findings have been reported in geriatric patients undergoing spinal surgery. The study demonstrated that preoperative malnutrition assessed using the GNRI was associated with a significantly increased risk of non-routine discharge, unplanned readmissions, and 30-day mortality [5,6].

Monitoring nutritional status with GNRI before surgery may therefore help reduce the risk of perioperative complications [7–9].

Weight loss is considered to be a vital indicator of deteriorating nutritional status. In one study involving 1,410 patients aged over 55 years undergoing surgery for gastrointestinal cancer,

preoperative weight loss of more than 10% was indicative of higher rates of postoperative complications, particularly infectious complications [10,11].

Hypoalbuminemia—defined as serum albumin levels below 3.5 g/dL [12,13]—is another strong marker of poor nutritional status.

Among patients over 65 years of age with femoral fractures, hypoalbuminemia was shown to be a strong predictor of postoperative complications [14].

In another study involving 29,377 elderly patients who underwent surgery for hip fracture, those with hypoalbuminemia had significantly higher mortality (9.94% vs. 5.53%), sepsis (1.19% vs. 0.53%), and unplanned intubation (2.64% vs. 1.47%) rates compared to patients with normal albumin levels [15].

Electrolyte disturbances, such as hypokalemia and hyponatremia, are common in malnourished elderly patients and are linked to higher perioperative morbidity.

Hypokalemia (serum potassium < 3.5 mmol/L) correlates with increased risk perioperative complications and worse outcomes [16].

Similarly, preoperative hyponatremia (serum sodium < 135 mmol/L) has been associated with a higher incidence of infectious complications, particularly in elderly patients undergoing gastrointestinal surgery [17].

Postoperative cognitive dysfunction (POCD) and postoperative delirium (PD) are common neurological complications in elderly surgical patients.

PD is characterized by fluctuating levels of consciousness, transient memory and perception abnormalities, while POCD involves persistent deficits in attention, comprehension and social integration.

The incidence of PD ranges from 3% to 61%, depending on the type of surgery.

Risk factors include age, malnutrition, pre-existing cognitive impairment, frailty, and dementia [18].

A study conducted at Vilnius University Hospital found that patients identified as malnourished one day before surgery using the Nutritional Risk Screening (NRS) tool had a threefold higher risk of postoperative delirium [19].

Delirium prolongs the duration of hospitalization, increases healthcare costs, and contributes to a higher one-year postoperative mortality[18].

Postoperative pneumonia is another prevalent and significant complication in elderly patients following surgery under general anesthesia.

It typically occurs within 30 days postoperatively and is more common in patients with comorbidities such as gastroesophageal reflux.

In one study, hypoalbuminemia was associated with a sixfold higher risk of postoperative pneumonia in patients with femoral fractures [20].

Another study involving 267 elderly patients with proximal femoral fractures found postoperative pneumonia in 35 cases, most commonly among patients over 70 years of age with diabetes, anemia, hypoalbuminemia, general anesthesia, and operative time > 120 minutes [21].

Wound healing is also strongly influenced by nutritional status.

In a study of 207 patients over 60 years old undergoing hip fracture surgery, 22.2% people experienced delayed wound healing. Lower scores on the Mini Nutritional Assessment (MNA) were significantly associated with impaired wound healing [22].

DISCUSSION

The collected data clearly demonstrate that malnutrition is a crucial risk factor for perioperative complications in older adults.

Multiple clinical studies have proven that geriatric patients with low body weight or insufficient protein and energy intake are more likely to experience wound-healing disorders and surgical site infections [22,23].

Nutritional interventions implemented both before and after surgery can reduce complications and facilitate recovery. Optimal results are achieved with oral nutritional supplements or enteral feeding, if clinically feasible [24].

However, routine preoperative nutritional assessment remains rare due to time constraints, lack of trained staff, and limited awareness among surgical teams.

In conclusion, available data indicate that malnutrition adversely affects surgical outcomes in older adults. The greatest benefits can be achieved through early risk identification, nutritional optimization, and a multidisciplinary approach to preoperative patient preparation.

CONCLUSIONS

Elderly patients exhibit reduced regenerative and adaptive capacities, therefore, recovery following surgery is more challenging.

Advanced age itself is an independent prognostic factor for postoperative mortality.

Malnutrition, common in geriatric patients due to decreased appetite, comorbidities, and reduced nutrient intake, further increases the risk of perioperative complications.

Optimizing the patient's nutritional status prior to surgery can improve postoperative outcomes, shorten the length of hospitalization, and facilitate recovery [25,26].

Both observational and interventional studies indicate a clear relationship between nutritional status and the incidence of complications, length of hospital stay, mortality, and postoperative recovery rate in older adults [27].

Author's contribution

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Software: not applicable;

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