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Research Article

Malnutrition in Surgery

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Abstract:

Malnutrition can occur due to insufficient nutrient intake, malabsorption, impaired metabolism, loss of nutrients or increased nutritional needs. Malnutrition progresses through stages, and each stage usually takes longer to develop. Nutrient levels in the blood and tissues change first, followed by intracellular changes in biochemical function and structure. Nutritional status has a major impact on the outcomes of surgical procedures. Nutritional status provides insight into the patient's condition, ie shows whether the patient is at risk of malnutrition or not. The most important thing is to assess the nutritional status immediately upon arrival at the hospital because it allows you to detect and recognize malnutrition in time and to assess the risk of malnutrition.Malnutrition of patients who are scheduled for surgery should be taken care of in time to avoid possible complications.

Keywords: malnutrition; nutrition; surgery, patient; health

Introduction

Malnutrition is not common in surgery, although it is noted that some patients sufferfrom malnutrition, both preoperatively and postoperatively, or in certain hypercatabolicconditions [1].

Preoperative malnutrition is often associated with hunger or indigestion before surgery.Such malnutrition can develop in (a) cases of poverty, (b) cases of dysphagia, (c) cases of excessive vomiting, (d) cases of cancer of the stomach, pancreas, liver or bile ducts,leading to impaired digestion. and jaundice, (e) cases of blind circle and fistula syndrome, and (f) the elderly and alcoholics who do not care for proper nutrition.

Postoperative malnutrition is quite common and transient in almost all cases. Thismalnutrition disappears as soon as the patient recovers from the postoperative periodand returns to normal nutrition. Any delay with a normal diet, e.g. after complicationssuch as paralytic intestinal obstruction and postoperative peritonitis, or after operations such as esophagectomy, severe malnutrition may occur.

Hypercatabolic Conditions

Following severe trauma, extensive surgery, seizures, severe sepsis, fever, and hypercatabolic renal failure, excess calories are consumed, and if large amounts of calories are not ingested, the skin on the body begins to break down fat about the same level to provide of calories needed for survival [1]. A healthy adult's total carbohydrate storage does not exceed 100-200 grams and provides only 400-800 calories. So in a severe course of the disease, the destruction of the protein will occur quickly. Since each gram of negative nitrogen balance represents a loss of approximately 30 grams of lean muscle mass, it can be seen that with a negative daily nitrogen balance of 10 grams per day, lean muscle mass will be lost over a period of 5 days. In many cases, nitrogen losses can significantly exceed these. After a hernia removal operation, the normal daily nitrogen loss is around 3g, which equates to 90grams of muscle loss. In appendectomy, the daily nitrogen loss is about 6 g, which is about 180 g of muscle loss. The daily nitrogen loss in cholecystectomy is about 12 g, which is about 360 g of muscle loss, and in esophagectomy, the daily nitrogen loss is about 90 g, which is about 2700 g of muscle loss. In peritonitis and in sepsis, daily nitrogen losses are of the order of 18 and 24 g. When protein catabolism increases in lean body mass and energy stores come from fat stores, it can account for 30 to 50 percent of needed calories. Glycolysis soon stops, but lipolysis continues and amino acids are further reduced through gluconeogenesis to provide energy. A negative nitrogen balance is accompanied by a negative potassium balance.

Examination

Chronic diseases, such as alcoholism, are commonly associated with protein-caloric malnutrition, as well as vitamin and mineral deficiencies [2]. Previous surgical procedures, such as gastric bypass or duodenal resection may lead to absorption malabsorption Overall or lack of iron, vitamin B12 or folic acid In most cases, malnutrition can be suggested by a history of underlying medical conditions or recent weight loss. Patients with renal failure who require hemodialysis lose amino acids, vitamins, trace elements and carnitine in the dialysis fluid. Patients with Cirhotics often have whole-body hypernatremia, although they are hyponatraemic and usually protein deficient. Patients with inflammatory bowel disease, especially those involving the ileum, may develop protein deficiency due to a combination of insufficient intake, chronic diarrhea, and corticosteroid therapy. In addition, changes in the enterohepatic circulation of bile salts lead to a deficiency of fat, vitamins, calcium, magnesium and trace elements. Approximately 30% of cancer patients have protein, calorie, and vitamin deficiencies due to underlying disease or metabolic chemotherapy (eg methotrexate). HIV- positive patients are often malnourished and have protein and mineral deficiencies (selenium and zinc), minerals and vitamins.

The complete history of current drug use is important to alert caregivers of potential deficiencies and drug-nutrient interactions. Although rarely the sole cause of malnutrition, certain herbal preparations can alter nutrient absorption. Agents containing ephedra and caffeine can be abused to cause excessive weight loss. Ginkgo and other drugs enhance the metabolism of cytochrome p450 of various drugs. Information on socioeconomic factors and detailed dietary history may reveal additional risk factors.

A careful physical examination begins with an overall assessment of the patient's appearance. Patients with severe acute malnutrition may appear emaciated, but more subtle signs of malnutrition include temporary muscle atrophy, pale skin, edema, and general loss of body fat. Protein status is assessed by limb muscle mass and strength and visible evidence of temporal and sphincter muscle atrophy. Cardiac blood flow murmurs may be caused by anemia. Vitamin deficiencies can be identified by changes in the texture of the skin, the presence of clogged pores or rashes, corneal blood vessels, cracks in the corners of the mouth (cheilosis), hyperemia of the mucous membrane (glossitis), enlarged heart, altered sensation. in Hands and feet have no vibration or sense of position. (dorsal and lateral column deficiency) or abnormal hair quality and texture. Deficiency of trace minerals causes skin and neurological abnormalities similar to those associated with vitamin deficiencies and can cause changes in the mental state of the patient.

Nutrition

Nutrition in surgical patients is a complex multifactorial topic [3].In addition to determining enteral or parenteral nutrition, the surgeon must consider specific patient characteristics that interfere with the delivery of nutrients that are beneficial and intended for digestion and metabolism. Postoperative ileus, previous bowel obstruction, small intestine, open stomach after injury control, or a patient with a discontinuous bowel that requires fluid-supplied energy for maintenance or resuscitation, to name just a few special conditions. These examples include situations where early feeding will be beneficial in nature. The intestinal fistula patient certainly deserves some focused discussion because this group of patients, more than the standard surgical patient or even the open-abdominal patient after damage control, has the added complication of nutrient and gastrointestinal loss.

Attention should also be paid to consideration of access to food, as many patients with these special circumstances do not have the ability to swallow food by mouth. Surgeons need to decide how they want to provide nutrition to their patients, and this often requires surgical or endoscopic placement of lines and tubes that can be used to deliver nutrients into the body. The timing of feeding and the location of food entering the body are additional decisions faced by surgeons.

Providing nutrition to critically ill patients is challenging for several reasons [4]. Many patients who are already malnourished need hospitalization or critical care because their serious illness can quickly make a person healthy or even malnourished. Other causes of malnutrition include heart, respiratory, endocrine, gastrointestinal or parasitic diseases, poverty, HIV or AIDS, alcoholism, illicit drug use, negligence or mental illness. We need to identify which patients are already malnourished, as this will affect how they are fed.

Malnutrition is a broad term. used to cover malnutrition and malnutrition There is currently no universally accepted definition. The British Association of Parental and Enteral Nutrition (BAPEN) describes malnutrition as follows: "a state of nutrition in which a deficiency or excess (or imbalance) of energy, protein and other nutrients causes measurable adverse effects on tissue/body form (body shape, size and composition) and function and clinical outcome". Although overeating comes with its own problems, the term "malnutrition" is used in this context to refer to malnutrition. Malnutrition is known to be associated with worse clinical outcomes. Complications of malnutrition include wound healing and decreased immunity, muscle loss, which can lead to longer duration of mechanical ventilation, longer stay, more frequent return, and increased morbidity and mortality. To minimize these complications, it is important to identify patients at risk or who are already malnourished at an early stage.

Frequency

Malnutrition occurs when energy, protein, vitamins and minerals are deficient, which affects body function and/or clinical outcomes [5]. It can occur in surgical patients as a cause or as a result of a surgical condition.

Malnutrition is a common finding in surgical patients: up to 50% of patients in general surgery wards have evidence of protein-energy malnutrition (PEM). Although in many cases this effect may be due to the nature of the disease process itself rather than malnutrition, it is important to ensure that, where possible, inadequate nutritional intake does not increase the likelihood of poor outcome in the critically ill and postoperative patient.

Indications

Nutritional support should be considered for all malnourished patients [5]. Malnourished patients are defined by NICE as those with:

• a BMI of less than18.5 kg/m2

• an unintentional weight loss greater than 10% within the last 3–6 months

• a BMI less than 20 kg/m2 and unintentional weight loss greater than 5% within the last 3-6 months.

Surgical patients at risk of malnutrition should also be considered for nutritional support if they have:

• not had, or are not likely to have, significant oral intake for more than 5 days, or

• a poor absorptive capacity, high nutrient losses or increased nutritional needs due to increased catabolic rate.

Nutritional Support

In many critically ill patients (especially those with SIRS and sepsis.), the underlying problem is related to improper use of fuel precursors. rather than a complete malnutrition. And no exogenously replenished nutrient intake will reverse the fuel- consuming processes in the body's reserves [5]. Therefore, efforts should be directed to identifying and treating the underlying cause, including the source of infection or dead tissue.

For any surgical patient who is unable to resume a proper diet for more than 3-5 days, as well as for any critically ill patient, nutrition support should be considered, although its benefits to date. This cannot be felt until the underlying disease is identified. Enteral nutrition should begin once the gastrointestinal tract is functioning and safely accessible. It is cheaper, safer, and has physiological advantages over alternative support methods. The barrier function of the small intestine deteriorates if luminal nutrients are not provided. This can increase the ability of bacteria and endotoxins to pass through the intestinal wall and possibly contribute to the development of multiple organ failure. The villous height, which determines the mass and surface area of the small bowel, also decreases rapidly, increasing the risk of diarrhoea on resumption of feeding. This in turn can delay the introduction of oral feeding, which compounding the situation. Furthermore, liver dysfunction, hyperglycemia and septic complications, especially chest infections, are significantly less common in enteral nutrition compared to parenteral nutrition.

Nutritional support should be an integral part of good surgical support and intensive care. The duration of the cooperation required should be taken into account. In mildly starved patients, who are being considered for elective surgery, nutritional support should be provided for at least 2 weeks pre-operatively before significant benefit can be expected.

Patients

Malnutrition is defined as an imbalance between nutritional value and basic energy needs [6]. Malnutrition is prevalent worldwide in acute care hospitals, and some studies estimate an incidence of 25–50% in US hospitals. Countless studies have shown that poor nutrition is associated with poor outcomes in hospital. Patients undergoing major surgery or experiencing sepsis are at unique risk for malnutrition, primarily because their physiology is characterized by hypermetabolism, inflammation, and catabolism. In fact, these patients need rest energy, which can increase up to 40% during the first week of hospitalization and 100% in the second week. Additionally, surgical patients have frequent periods of starvation prior to surgery and secondary to perioperative complications such as bowel obstruction and inability to tolerate feeding. Severe malnutrition during stay can lead to serious consequences for these patients, especially if they are already malnourished, elderly or permanently ill.

The American Society for Parenteral and Enteral Nutrition (ASPEN) states that the purpose of nutrition therapy is to maintain a lean body, maintain immune function, avoid metabolic complications, and ameliorate oxidative stress for serious illnesses The literature on intensive surgical care is replete with research showing that food therapy and targeted supplementation are associated with reduced infection rates, duration of mechanical ventilation, length of stay (LOS), and mortality in critically ill patients in the intensive care unit (ICU).

Malnutrition is common in critically ill patients and nutritional support is important to reduce complications and optimize recovery [7]. It is well known that the enteral route is preferred for supplemental nutrition because it reduces mucosal atrophy and reduces the risk of bacterial migration. If the digestive system works, it must be used. The nasogastric tube can be used in a patient who is unable to swallow, whether due to mechanical ventilation, risk of cravings or otherwise. It is ideal for patients who are expected to need less than 30 days of supplemental nutrition. Risks of nasoenteric tubes include aspiration, misplaced percussion, displacement, and pharyngeal injury.

Placement of a gastric versus post-pyloric feeding tube is a widely discussed topic. However, several studies have shown that critically ill patients have similar risks of aspiration when fed through the post-pyloric stomach. However, small intestinal feeds (jejunal) is associated with fewer infectious complications compared to gastric feeds. The nasoenteric tube can be placed close to the bed without the use of endoscopy; However, care must be taken to avoid inserting the probe into the lungs, which could lead to pneumothorax or insertion of the probe into the thoracic cavity. Initial tube placement at approximately 35 cm, followed by chest radiography, can determine the position of the esophagus or tracheal arrangement, while preventing the deep position that causes the alveolar rupture. After confirming the location in the esophagus, the tube can be safely advanced. When the target issigmoid nasal placement, endoscopy may be required if it is unsuccessful.

Infections

Part of the evaluation of the patient's medical history is designed to assess the patient's ability to defend against infection [8]. Some diseases and some types of drug use can affect this ability. Weak patients are more prone to infections, and these infections tend to get worse more quickly. Therefore, in order to treat their infection more effectively, it is important to be able to differentiate patients who may have compromised the host defenses.

The difference between the medical conditions that can cause a decrease in the defense is important. These trade-compromises allow more bacteria to enter tissues or become more active, or prevent humoral or cellular protection from full action. Several conditions can damage the patient's defenses.

Uncontrolled metabolic diseases - such as uncontrolled diabetes, end-stage renal disease with polyuria and severe alcoholism with poor diet - lead to reduced leukocyte function, including reduced chemotaxis, phagocytosis and bacterial killing. Of these metabolic diseases, poorly controlled type 1 (insulin-dependent) and type 2 (non-insulin-dependent) diabetes are the most common immunocompromising diseases, and worsening control of hyperglycemia correlates directly with lowered resistance to all types of infections.

The second major immunodeficiency syndrome is those that interfere with host defense mechanisms, such as leukemia, lymphoma and various types of cancer This disease results in decreased white blood cell function and decreased antibody synthesis and production.

Human immunodeficiency virus (HIV) infection attacks T lymphocytes, conferring resistance to viruses and other intracellular pathogens. Fortunately, odontogenic infections are caused by extracellular pathogens (bacteria). Thus, HIV-positive people can fight odontogenic infections quite well until the acquired immunodeficiency syndrome develops to advanced stages, since B-lymphocytes are also highly compromised. Nevertheless, the treatment of an HIV-positive patient with an odontogenic infection is generally more intensive than for a normal patient.

Metabolic Dearangement

Inflammation and oxidative stress characterize the physiological state after injury, surgery and sepsis [6]. Oxidative stress occurs when the biological system produces reactive oxygen species (ROS) in excess of its endogenous detoxification capacity. This causes a systemic ROS imbalance, and these species continue to damage cell membranes, enzymes, mitochondria, and DNA, leading to a cascade of metabolic disturbances. Indeed, the oxidative stress of an excessive pro-inflammatory immune response is directly related to catabolism, insulin resistance, systemic acidosis, and coagulopathy.

Malnutrition increases metabolic disorders in sepsis and postoperative conditions. Malnutrition is associated with prolonged oxidative stress, immunosuppression, and delayed wound healing, which increases the risk of disseminated infection and multiorgan failure. In addition, catabolism associated with malnutrition and oxidative stress leads to deconditioning and muscle atrophy, which probably contributes to prolonged mechanical ventilation. Finally, the gut is also affected by malnutrition and starvation, with mucosal atrophy and malabsorption occurring early in the hospital course. Lymphatic tissue involved in the intestine is reduced. increased risk of infection Enteral nutrition (EV) treats many of the above metabolic disorders in patients with sepsis and after surgery. EN supports the barrier function of the intestinal mucosa, increases immunity and IgA secretion, reduces systemic inflammation and oxidative stress, and prevents muscle wasting.

Enteral Feeding

Fasting does not help or reduce the inflammatory reaction [9]. Enteral feeding is superior to parenteral and the only contraindication is poor motility of the gastrointestinal tract.Enteral nutrition prevents bacterial overgrowth in the gut, reduces bacterial displacement, and reduces the risk of systemic infection, organ dysfunction, and death. In addition, all critically ill patients are at risk of malnutrition, and therefore patients with acute pancreatitis should start ingestion as soon as possible.

Enteral nutrition can be gastric or post-pyloric. Most patients tolerate gastric emptying through a nasogastric tube, but residues should be monitored every 6 hours. If gastric feeding is not possible due to impaired gastric emptying and is not relieved by the use of erythromycin or other prokinetics, the nasojejunal type of nutrition should be instituted by endoscopy or self-gliding tubes.

Tube feeding should be started slowly (eg 10 ml/h). If the remaining volume of the stomach is less than 250 ml, it must be increased by 10 ml/h every 6 hours. This should be continued until the target of internal nutrition is achieved. To avoid rare but fatal complications of bowel necrosis, the volume should not exceed 60 ml/h. If the patient does not tolerate enteral nutrition in sufficient volume, parenteral nutrition can be combined with enteral nutrition to meet nutritional requirements.

Conclusion

Between the ages of 20 and 80, food intake decreases, especially in men. Anorexia caused by aging itself has a number of causes, including decreased adaptive relaxation of the gastric fundus, increased release and activity of cholecystokinin (which causes satiety), and increased leptin (anorexic hormone produced by fat cells). Reducing the sense of taste and smell can reduce food enjoyment, but usually only slightly reduces food intake. Anorexia can have other causes (for example. loneliness, inability to buy or prepare food, dementia, some chronic diseases, taking some medications). Depression is a common cause. Eating is sometimes hampered by anorexia, nervousness, paranoia or mania. Dental problems can limit the ability to chew and therefore digest food. Swallowing problems are common (for example, due to stroke, other neurological diseases, esophageal candidiasis or xerostomia). Poverty or disability can limit the availability of nutrients.

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