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Before and intraoperative preparation of patients for elective gynecological surgery (use of ERAS protocol, starvation before surgery, carbohydrate supply) - review of the latest guidelines

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Summary:

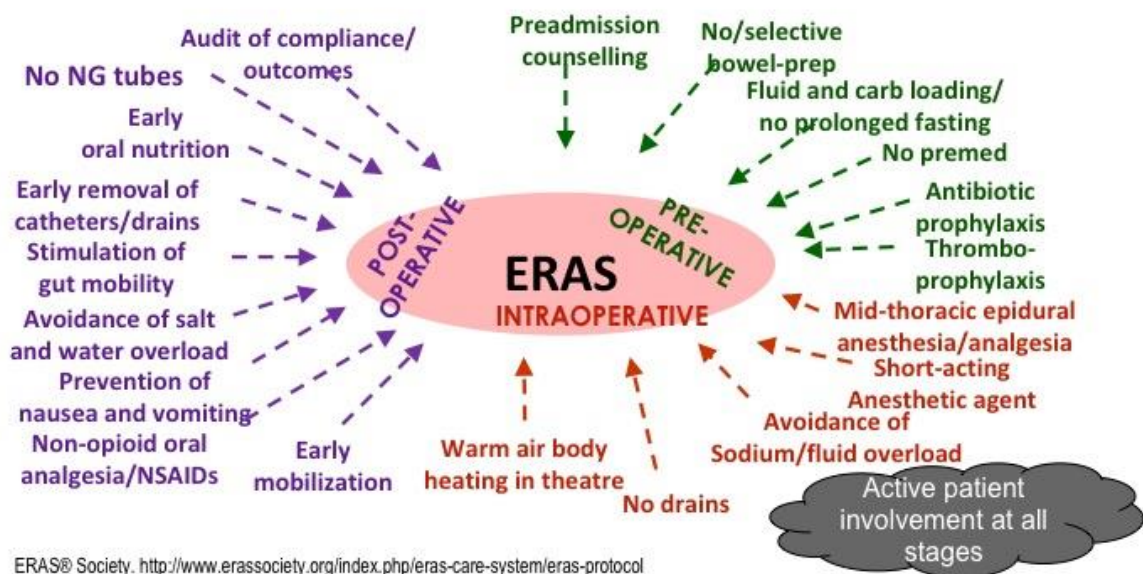
One of the most common reasons for hospitalization of patients in the ward is the need to perform an operation. Preoperative diagnosis should take place in outpatient settings, and the duration of hospitalization is reduced to a minimum. Short period of a patient's stay in hospital is crucial in the prevention of hospital infections and post-operative complications and also involves a reduction in treatment costs. Proper preparation of the patient for surgery including, among others, the implementation of the ERAS (Enhanced Recovery After Surgery) protocol allows safe operation and promotes the proper course of postoperative convalescence of the patient.

Key words: perioperative dietary recommendations, ERAS protocol, carbohydrate supply, oxidative stress

ERAS protocol

The comprehensive perioperative care protocol for improving treatment outcomes - ERAS (Enhanced Recovery After Surgery) was created to harmonize and improve the principles of preparing patients for surgery, which is part of the lack of prolonged fasting, avoiding preoperative intestinal preparation, pre-operative supply of carbohydrate drink. On the other hand, despite the lack of scientific evidence for the benefits of pre-operative fasting, it is currently a practice commonly used in surgical wards [1].

Core ERAS Protocol



The use of the ERAS protocol in gynecological surgery is associated with shortening the patient's stay in the ward and reducing the cost of treatment, as well as affecting the patient's satisfaction [2].

Recent studies on the nutrition of patients prior to surgery clearly emphasize the negative impact of metabolic complications on treatment outcomes, and emphasize the importance of nutrition to reduce acute metabolic disorders. It was established that insulin resistance related to surgery is a key mechanism for the development of complications and delayed recovery. The ERAS protocol clearly stresses that supporting regeneration after surgery results in a significant improvement in treatment outcomes. The ESPEN Society stresses that surgical procedures should be performed in the best nutritional conditions, which include proper nutritional support combined with exercises before the surgery. In addition,

there is mention of the need to carry out a series of tests and examinations to qualify the patient for nutritional intervention. If necessary, we are talking about supplementation with nutrients containing immunosuppressants, i.e. arginine, omega-3 fatty acids that can modulate the immune response and reduce the risk of infectious complications. An additional benefit of their use is the reduction of insulin resistance and hyperglycaemia [3].

Implementation of this protocol to the practice requires cooperation of the entire therapeutic and care team: the attending physician, anesthesiologist, nurses / midwives working in the ward and within the team working on the operating block [2].

Starvation in the pre-operative period

The formula of prolonged preoperative fasting, used over the years, was introduced as the prevention of aspiration of gastric contents during intubation. This method conflicts with the purpose of accelerated convalescence, because it leads to dehydration of the patient and reduced caloric intake. In addition, prolonged hunger leads to preoperative discomfort as well as unwanted metabolic changes that may adversely affect the results of treatment [2].

Published in 2011, the European Society of Anesthesiology (ESA) recommends stopping solid foods 6 hours before planned anesthesia and clear liquids (ie: water, tea and coffee without added milk) 2 hours before surgery [6]. Prolonged fasting before surgery may increase the occurrence of post-operative insulin resistance, which may be the cause of metabolic complications in the perioperative period (ie: intensification of oxidative stress, which occurs with each surgical procedure as an organism's response to injury), as well as deteriorate the patients' well-being surgery [5]. The effects of long-term pre-operative starvation can lead to post-operative complications, increase patient hospitalization, and worsen treatment outcomes.

Preoperative starvation and surgery result in metabolic stress, which is the body's response to injury, as well as insulin resistance, which is characterized by hyperglycaemia and reduced tissue response (mainly skeletal muscle and liver) to the biological action of insulin. The development of insulin resistance is associated with increased morbidity, mortality and length of hospital stay [6]. In addition, by reducing the length of preoperative starvation, the risk of oxidative stress in patients undergoing surgery may be reduced in patients, and avoidance of pre-operative dehydration stabilizes the circulation dynamics during anesthesia. By shortening the period of starvation, we can therefore contribute to the acceleration of post-operative recovery [7].

Carbohydrate supply

Carbohydrates contained in the diet, after being converted into glucose in the body, become the basic metabolic fuel. Unfortunately, its excess or rapidly changing level may lead to health problems and contribute to the development of obesity, insulin resistance and type 2 diabetes. In addition, fluctuations in blood glucose in critically ill patients or patients after surgery may hinder a patient's recovery and even cause complications or death. The quality of carbohydrates consumed and their bioavailability may affect the postprandial plasma glucose concentration and the inflammatory response considered to be an important component of the metabolic syndrome. The modification of the diet and the quality of carbohydrates consumed especially in the perioperative period may have a positive effect on the modulation of the inflammatory response in the body [3].

Studies show that the lack of available source of energy during increased demand (eg after surgery) has adversely affected the results of perioperative treatment. Animal studies show that the ability to respond to injuries as well as the response to metabolic stress is much better in feeding (food supply) compared to the period of hunger. In addition, metabolic stress,

postoperative pain, prolonged starvation, and immobilization cause hyperglycemia and insulin resistance, which was associated with complications after abdominal surgery. Studies of patients prepared for the procedure showed that the isoosmolar carbohydrate fluid is completely eliminated from the stomach within 90 minutes of administration, which makes it safe before surgery and effectively prevents insulin resistance. Additional benefits include improved well-being and reduced nausea, vomiting, anxiety and thirst and hunger [3].

Guidelines of the American Society of Anaesthesiologists, European Association of Clinical Nutrition indicate that, except for special cases in which delayed gastric emptying is present, it is advisable to apply a clear fluid strategy (water, carbohydrate drink, coffee / tea without milk, fiber-free juice) to 2-3 h before the planned anesthesia and a light meal (toast / meal without fat) up to 6 hours before the planned anesthesia is allowed. In addition, it has been proven that this does not increase the risk of aspiration, but prevents the thirst in many patients being prepared for surgery [7]. Studies show that up to 40% of patients before surgery can have abnormal blood glucose levels. In the group of patients with previously unrecognized hyperglycaemia, the risk of adverse perioperative events was higher than in patients with previously diagnosed diabetes. The authors of the study suggest that it seems reasonable to control the level of glucose in the blood before the surgery [8].

In addition, scientific studies have shown that taking clear fluids 2 h before surgery does not increase the stomach content, reduces the pH of gastric juice or increases the incidence of complications. In order to obtain a good metabolic status, it is recommended to administer carbohydrates in the perioperative period [8].

The application of the ERAS protocol counteracts the abovementioned adverse events, which is reflected in the results of tests confirming the beneficial effect of oral supply of a special carbohydrate fluid for 2 hours before the planned anesthesia. The supply of carbohydrates in this form causes pre-operative release of insulin, which positively modifies the body's response to injury and reduces oxidative stress [2, 6, 8, 9].

Summary

Surgery releases stress hormones, which significantly reduces postoperative insulin sensitivity. The authors of the ERAS protocol recommendations emphasize the necessity of oral carbohydrate administration before surgery (when there is no possibility of oral supply - intravenous supply recommended), combined with effective analgesic intervention (eg.: epidural catheter) and early rehabilitation and start-up [7].

It is worth noting the appropriateness of introducing ERAS protocol for improving perioperative patient comfort. The studies showed that the supply of 800 ml of carbohydrate fluid one day before surgery and 400 ml for 2 h before surgery reduces patient's peri-operative discomfort, including feeling of hunger, dry mouth, fatigue, weakness and headache. In addition, there was a reduction in post-operative vomiting and pain severity [5]. The introduction of the ERAS protocol and the shortening of perioperative starvation as well as the supply of carbohydrates during surgery are underlined. However, it should be emphasized that data regarding the safety of the application of the above protocol in patients with obesity (BMI > 30 kg / m²), patients in the assessment of the risk scale - ASA III, patients with diabetes are scarce [6].

The abovementioned guidelines present recommendations of the ERAS group regarding pre- and intraoperative treatment of patients undergoing surgery in the field of gynecological oncology and gynecology. Due to incomplete data for this group of patients, some of the recommendations were based on results from other disciplines of surgery, including gastrointestinal surgery [8].

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