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Review Article

CIENT PERIODIQUE

Physiotherapy and ERAS Protocol

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Abstract

Introduction

ERAS programs were introduced in the late of 1990s, originated from colon surgery, but have spread to other surgeries including, among others, gastrointestinal, hepatocellular, orthopedic, cardiac thoracic and gynecological surgery. ERAS programs are supported by preoperative, perioperative and postoperative procedures. The ultimate goal is to minimize postoperative dysfunction and to enhance rehabilitation [1]. Today, orthopedic surgery remains one of the most common ambulatory and hospital surgical procedures. The concept of ERAS and its increased safety and efficacy in orthopedic surgery is continually being investigated.

Purpose

Early postoperative mobilization is a fundamental principle of ERAS programs. It has been shown to reduce morbidity and length of stay after major surgery The purpose of the present study is to demonstrate that early mobilization can accelerate the achievement of faster functional recovery,

reduce the rate of postoperative pulmonary complications, venous thromboembolism, infections. and they make the surgical patient functionally independent and able to return to their daily routine.

Method

Information was collected from studies which they demonstrate the efficacy of preoperative and postoperative physiotherapy in accordance with the principles of the ERAS protocols. A PubMed literature search was performed for articles that included the terms enhanced recovery and orthopedic surgery. In this article, we summarized the clinical application of ERAS and highlighted the key elements that characterize an enhanced recovery program.

Results

The ERAS protocols undoubtedly promote rapid recovery with a view to reduce post-operative stress and its effects. Consequently, planned, documented perioperative care follows. In order to implement the ERAS protocols, good cooperation between health professionals of different backgrounds is needed.

Conclusion

Patients who follow the ERAS protocol move faster to their functional independence by setting themselves capable of self-care of their personal hygiene as well as in their professional and social activities. ERAS protocols also reduce the time spent in the hospital and the possibility of re-admission, therefore the cost of hospitalization.

Introduction

ERAS protocol introduced in the late 1990s. It was implemented for the first time in colon surgery, but very soon spread to other surgeries, including gastrointestinal, hepatocellular, orthopedic, cardiac and other surgical specialties. ERAS programs are supported by preoperative, perioperative and postoperative procedures.

The principles of ERAS are based on the knowledge that many of the negative effects of a surgery (eg loss of muscle mass and weight as well as reduced resistance to infection) can be reduced by preparing the patient preoperatively [2]. The ultimate goal is to minimize postoperative organ dysfunction and enhance rehabilitation [1].

Postoperative complications have as result to increase hospitalization and health care cost, affect patient function and their quality of life. Moreover they have potential effects on mortality [3].

In addition, there is a strong correlation between the number of postoperative complications and the preoperative functional capacity of the patients, their eating and mental condition which are determined

by their lifestyle and habits, such as smoking and drinking [4-7]. Therefore, it is desirable to improve perioperative care.

Today, orthopedic surgery remains one of the most common ambulatory and hospital surgical procedures. Additionally, length of hospital stay continues to be an accurate predictor of monetary burden on the healthcare system. The burden of cost lies in postoperative care, including physical and occupational therapy, nutrition, and social services, which directly influence cost accrued The concept of ERAS and its increased safety and efficacy in orthopedic surgery is continually being investigated. Reports suggest a decrease in the length of hospital stay after total arthroplasty from 4-12 to 1-3 days with no significant increase in readmission for any reason [8].

Basic Lines

• ERAS protocols include a combination of documented perioperative interventions involving the surgeon, anesthesiologist, nurse, physiotherapist, and dietitian as a single interdisciplinary team.

• ERAS protocols are a multifactorial approach to postoperative rehabilitation and surgical patient care. They are easily applicable, reduce morbidity, perioperative stress, postoperative pain, postoperative complications and hospitalization.

• Implementing an ERAS protocol requires the active participation of the patient throughout the program.

• The implementation of the ERAS protocols reduces the cost of hospitalization and the costs of the health sector.

Enhanced Postoperative Rehabilitation (ERAS) is a multimodal approach based on documentation to optimize patient outcomes after surgery. The role of physiotherapy in ERAS protocols is important in both preoperative and postoperative routine. The implementation of a preoperative program has been shown to promote the preparation of the musculoskeletal and respiratory systems to cope with an impending physiological stress [9] and the rapid functional recovery of a surgical patient, basic parts of ERAS. A review of the literature showed that preoperative exercise in patients scheduled for surgery (thoracic and abdominal) is tolerable and effective [10]. Postoperative exercise programs are also recommended by the ERAS guidelines, promoting muscle recovery and return to function after major surgery [11].

Since ERAS was first applied in hospitals twenty years ago, postoperative outcomes have improved for patients [1]. The length of stay was reduced, without a consequent increase in re-admission rates [12], while improving clinical outcomes, while having a beneficial effect on healthcare resources.

Physiotherapy and ERAS

Early postoperative mobilization is a fundamental principle of ERAS programs. It has been shown to reduce morbidity and length of stay after major surgery [1,13]. Immobilization due to hospitalization causes a decrease in muscle strength, insulin attachment and functional disability. Early mobilization can accelerate the achievement of faster functional recovery. It has been shown to reduce the rate of postoperative respiratory complications, venous thromboembolism and infections [13].

In selective cardiac surgery, there are evidences that preoperative physiotherapy reduces postoperative pulmonary complications. Similar results are indicated for abdominal surgery. Dronkers at al reported the relationship between preoperative physical fitness / activity and outcome after scheduled major abdominal surgery [14,15].

High-risk patients undergoing major surgery due to surgical stress are prone to weight loss due to pre-existing reduced general health and muscle, cardiorespiratory and neurological damage. While healthy patients have the ability to cope with the stress response, high-risk patients may not have this ability. Therefore, these patients are at greater risk for postoperative complications [16].

Preoperative Physiotherapy

Preparing a patient for orthopedic surgery aims to improve patients' resilience to the effects of surgery, and even without complications there is a postoperative reduction in functional capacity [17].

The preoperative approach should be multimodal with the aim of improving patients' physical condition, balancing and supplementing nutritional needs, changing mental status through psychological support, and smoking cessation [18,19].

ERAS patient education for orthopedic surgery includes setting realistic goals and expectations for surgery and recovery, recommending preoperative nutrition and exercise regimens, educating about the ERAS components and educating about pain management (perioperative and postoperative MMA, how to grade pain, how pain scores translate to analgesia selection, etc.) In addition to providing videos, handouts, and oral presentations to educate patients, some research groups also implemented a helpline and enlisted 24-hour on-call nurses to aid in preoperative patient education [20].

An international research consortium for rehabilitation, under the guidance of Professor Dr. Francesco Carli of McGill University in Montreal, created the "best practice" for multimodal rectal surgery in 2016. A four-pillar program with exercise, nutritional support with protein and vitamin supplements, and mental support of smoking. This program has been adapted to many clinical trials, and for other diseases than colon cancer populations.

Implementation of the ERAS program successfully altered the process-of-care metrics for patients undergoing emergency hip fracture repair and patients undergoing elective colorectal resection across 20 hospitals. In this study of more than 15,000 surgical patients, program implementation was associated with significant absolute and relative improvements in hospital length of stay and surgical complication rates [21].

Macfie *et al* evaluated 232 patients with femoral neck fractures and found that an ERAS program reduced postoperative complications. With a pre-post study design, Pedersen *et al* reported significant reductions in inpatient complication rates with a significant reduction in hospital mortality among community-dwelling patients. We identified a similar reduction in complication rates along with a modest reduction in length of stay [21].

Indicative Program

Interview with the patient one month before the admission: Patients need to be informed about the surgery they will undergo. Thus, after the diagnosis, special questionnaires can be completed with the data of the hereditary and personal history, in order to identify the possible risk of complications or death in high-risk patients (high-risk group) [22,23]. They are also informed about a daily exercise program aimed at improving the respiratory and musculoskeletal system, as well as how to mobilize postoperatively. In addition, smoking and alcohol cessation are recommended, ideally 4 weeks before scheduled surgery [24]. Chronic health problems, such as bronchial disease, chronic obstructive pulmonary disease, should be managed prior to surgery with an appropriate breathing exercise program [25,26]. In case of obesity or cachexia, a specific diet and exercise program is given that the patient should follow until the day of the surgery. The overweight patient is recommended to walk thirty minutes daily once a day and gradually increase, according to plan, up to one hour twice a day [27].

One day before scheduled surgery: The new preoperative guidelines, for various forms of anesthesia, support the safety of eating solid foods up to 6 hours before surgery and fluids (400ml) up to 2 hours before general anesthesia. The latest instructions are also given regarding the respiratory system and postoperative mobilization, educating the patient on ways of bronchial drainage and coughing, as well as getting out of bed, walking and using aids (Smith *et al* 2011).

Postoperative Physiotherapy

Early postoperative mobilization is a fundamental principle of good physiotherapy practice and ERAS programs. It has been shown to reduce morbidity and length of stay after major surgery [1,13], by immobilization due to hospitalization causing a decrease in muscle strength. In the postoperative phase, one of the most important elements associated with physical activity is mobilization. According to the ERAS approach, the goal is to get patients out of bed on the same day as surgery.

Indicative Program

Mobilization - Rise: Early mobilization reduces muscle contraction and protects the patient from the possibility of venous invasion. The main goal of the ERAS protocols is the immediate mobilization of the patient [28]. The patient is first mobilized in her bed by raising the bed and then in a sitting position, either in bed or in a chair. Ideally the patient should be able to move in her room within the first six hours after the end of the operation. However, overtraining is not allowed on the day of surgery, as it may cause orthostatic hypotension or discomfort to the patient.

From the next day the patient can mobilize and get out of bed with the physiotherapist by walking short distances in order to reduce pain, improve cardiovascular function, improve muscle strength and increase mobility. In addition, the program of respiratory exercises for bronchial drainage and the improvement of respiratory function to reduce respiratory complications continues. Finally, an integral part of the postoperative mobilization is the training of family members for the gradual reintegration of the patient [29-33].

Conclusion

ERAS protocols undoubtedly promote rapid recovery in order to reduce postoperative stress and its effects. Therefore, they follow a planned, documented perioperative care that includes timely feeding, rapid mobilization, satisfactory postoperative analgesia, prevention of postoperative nausea and vomiting, trauma care, and prevention of complications. In order to implement the ERAS protocols, the full cooperation of health professionals of different specialties is needed.

The patient who follows an ERAS protocol mobilizes faster, becomes independent faster, feeds on her own, receives her treatment from the mouth and leaves more quickly.

Future research should focus on establishing a standard rehabilitation program, which will be updated by ERAS authorities, which can be provided by specialist physiotherapists in hospital and in an outpatient setting. Prospective studies are needed to determine the long-term impact of early exercise-based mobilizations and interventions. Examining how functional recovery is achieved and measured should be the focus of future physiotherapy research, which will be based on the principles of the ERAS protocols.

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Conflicts of Interests

The authors declare no conflict of interest in this work.

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