Prehabilitation in preoperative care

Barbara van Munster
UMCG, The Netherlands
Trajectories Surgical Patients

(Stabenau, 2018)

Number of Disabilities

- Severe disability (n=33, 13.2%)
- Moderate disability (n=73, 29.2%)
- Mild disability (n=84, 33.6%)
- No disability (n=60, 24.0%)

Months before major surgery

- Little improvement (n=57, 22.8%)
- Partial improvement (n=70, 28.0%)
- Gradual improvement (n=76, 30.4%)
- Rapid improvement (n=39, 15.6%)

Months after major surgery
Outcome related to disability preoperative

(Stabenau, 2018)
CGA in surgical oncology

↑Risk of complications:
- Frailty
- Deficiencies in (I)ADL
- Depressive symptoms
- Fatigue
- Cognitive impairment
- Comorbidity

↑Risk of discharge nonhome institution:
- Frailty
- Deficiencies in IADL
- Depressive symptoms
- Weight loss
- ASA

(Feng, 2015; Huisman 2017)
Impact of Outcomes

Patient Preferred Outcome

- Maintaining Independence
- Keeping You Alive

Costs

- Baseline cost of colorectal cancer care (all patients: n=6768)
- Additional costs of patients with mild complications (n=819)
- Additional costs of patients with severe complications (n=1426)

(Fried, 2011) (Govaert, 2015)
Fixed vs. Changeable

Fixed:
- Age
- Education
- Elective vs Acute
- Tumor stage
- (Comorbidity)
- ........

Changeable:
- Frailty
- Physical Function
- Nutritional status
- Anemia
- Intoxications (alcohol/smoking)
- Psychological distress

https://www.evidencio.com/
Minimalisation of surgical risks

PREOPERATIVE

Minimale invasive technics, Safetychecklist Geriatric co-management

PEROPERATIVE

Enhanced recovery after surgery (ERAS)

POSTOPERATIVE
Prehabilitation

- Enhancing an individual’s reserve capacity to enable a patient to withstand a forthcoming stressor (major surgery)

- Multimodal approach aimed at:
  - Improving physical condition
  - Improving nutritional status
  - Improving mental status (e.g. anxiety reduction, coping)
  - Reducing smoking / alcohol
  - Optimisation medication / medical conditions (anemia)
  - Frailty? (casemanagement)
Prehabilitation is hot!

F. Carli
Prehabilitation

ADL function

Independent

Dependent

Surgery

Functional Recovery

Prehabilitation

No Prehabilitation

Preoperative Period

Postoperative Period

Prehabilitation in colorectal cancer

PHYSICAL TRAINING

NUTRITION

The effects of physical prehabilitation in elderly patients undergoing colorectal surgery: a systematic review


*Department of Surgery, Academic Medical Centre, Amsterdam, the Netherlands; †Department of Surgery, Ghent Hospitals, Aalst, the Netherlands; ‡Department of Surgery, VU Medical Centre, Amsterdam, the Netherlands; §Department of Medicine, University Medical Centre, Groningen, the Netherlands; and †Department of Gastroenterology, Ghent Hospitals, Aalst, the Netherlands

Received 9 November 2013; accepted 28 April 2014; Accepted Article online 22 June 2014

Abstract

Aim Prehabilitation, defined as enhancement of the preoperative condition of a patient, is a possible strategy for improving postoperative outcome. Lack of muscle strength and poor physical condition, increasingly prevalent in older patients, are risk factors for postoperative complications. Eighty-five per cent of patients with colorectal cancer are aged over 60 years. Since surgery is the cornerstone of their treatment, this review systematically examined the literature on the effect of physical prehabilitation in older patients undergoing colorectal surgery.

Method Trialed and case-control studies investigating the effect of physical prehabilitation in patients over 60 years undergoing colorectal surgery were retrieved from MEDLINE, EMBASE, CINAHL, and the Cochrane library. Patient characteristics, the type of intervention and outcome measurements were recorded. The risk of bias and heterogeneity was assessed.

Results Five studies including 883 patients were identified. They were small, with an average of 77 patients and were of moderate methodological quality. Compliance rates of the prehabilitation programme varied from 16 to 97%. None of the studies could identify a significant reduction of postoperative complications or length of hospital stay. Four studies showed physical improvement (walking distance, respiratory endurance) in the prehabilitation group. Clinical heterogeneity precluded a meta-analysis.

Conclusion Prehabilitation is a possible means of enhancing the physical condition of patients preoperatively. The quality of studies in older patients undergoing colorectal surgery is poor, despite the increased number of elderly people with colorectal cancer. Defining specific patient groups at risk and standardizing the outcomes are essential for improving the results of treatment.

Keywords Prehabilitation, colorectal surgery, elderly

Introduciton

Colorectal cancer is one of the leading causes of death worldwide [1]. Age has been defined as a risk factor for cancer [2], and 85% of patients diagnosed with colorectal cancer are aged over 60 years. The effect of preoperative physical conditioning on perioperative outcome is not clear.

Oncology Research and Practice

Oral Nutrition as a Form of Pre-Operative Enhancement in Patients Undergoing Surgery for Colorectal Cancer: A Systematic Review

Emma R.J. Bruns, Tanja E. Argilander, Bauke Van Den Heuvel, Christianne J. Buskens, Peter Van Duijvenblik, Remato W. Winkel, Annette Kalf, Edwin Van Der Zaag, Belfco B. Wassenear, Willem A. Bemelman, and Barbara C. Van Munster

*Department of Surgery, Academic Medical Centre, Amsterdam, the Netherlands; †Department of Surgery, Ghent Hospitals, Aalst, the Netherlands; ‡Department of Surgery, VU Medical Centre, Amsterdam, the Netherlands; §Department of Medicine, University Medical Centre, Groningen, the Netherlands; and †Department of Gastroenterology, Ghent Hospitals, Aalst, the Netherlands

Received 9 November 2013; accepted 28 April 2014; Accepted Article online 22 June 2014

Abstract

Background: Nutritional status has major impacts on the outcome of surgery, in particular in patients with cancer. The aim of this review was to assess the merit of oral pre-operative nutritional support as a part of prehabilitation in patients undergoing surgery for colorectal cancer.

Methods: A systematic literature search and meta-analysis was performed according to the Preferred Reporting of Systematic Reviews and Meta-Analyses (PRISMA) recommendations in order to review all trials investigating the effect of oral pre-operative nutritional support in patients undergoing colorectal surgery. The primary outcome was overall complication rate. Secondary outcomes were incision infection rate, anastomotic leakage rate, and length of hospital stay.

Results: Five randomized controlled trials and one controlled trial were included. The studies contained a total of 583 patients with an average age of 63 years (range 23–88 years), of whom 87% had colorectal cancer. Malnutrition was present in 4% of all patients. In all trials, patients had been randomized to either receive nutritional support (oral refeeding) or standard treatment. Overall complication rates ranged from 32%–100%. There was no significant reduction in the overall complication rate in nutritional patients versus standard treatment (odds ratio 0.82; 95% confidence interval 0.52–1.25).

Conclusion: Current studies are too heterogeneous to conclude that preoperative oral nutritional support could enhance the condition of patients undergoing colorectal surgery. Patients at risk have a relatively lean body mass deficit (sarcopenia) compared to an absolute malnourished status. Compliance is an important element of standardization. Targeting patients at risk, combining protein supplements with strength training, and defining standardized patient-related outcomes will be essential to obtain satisfactory results.

Keywords: colorectal cancer; nutrition; prehabilitation, surgery
Prehabilitation in colorectal cancer

• 6 trials on physical activity:
  - no reduction of postoperative complications or length of hospital stay.
  - 4 studies showed physical improvement (walking distance, respiratory endurance)

• 6 trials on nutrition:
  - no significant reduction in the overall complication rate
Prehabilitation in breast cancer

6 studies: 2 RCTs, one prospective, nonequivalent group comparison, and 3 prospective observational studies:

• 1 RCT showed effect on upper extremity functionality recovery
• 1 cohort–control study demonstrated that preoperative exercises reduced postoperative pain
• Observational: Arm function before surgery predicts function after 1 month, active individuals better outcome after 3 wk

(Yang, 2018)
Prehabilitation in Non-Small-Cell Lung Cancer

10 RCTs, 1 multicomponent training:
• Improvement in walking endurance, peak exercise capacity, dyspnoea, risk of hospitalization before surgery
• Reduction in postoperative pulmonary complications
• Preoperative combined aerobic, resistance, and inspiratory muscle training 1-3/wk, 4 weeks: + effect on walking after 1 month

(Rosero, 2019)
Psychological Prehabilitation in cancer

7 studies (6 RCT):

- Components intervention: stress management, coping, psychotherapy, relaxation, structured teaching program
- No effect length of hospital stay, complications
- Impact on psychological outcomes, quality of life, and somatic symptoms

(Tsimopoulou, 2019)
Overall Evidence

- Quality of studies is low
- Variable interventions:
  - Mono- and multicomponent
  - Duration: 2-4 weeks
  - At home and/or supervised
- Lack of baseline measurements
- Compliance unknown
- Limited to healthy older patients
- Outcomes of interest are lacking
- No information about cost-effectiveness

**Conclusion:** although promising, high quality studies needed
Pilot Fit4Surgery

DAILY
1x “Senior 7-Minute Workout”
2x 20g protein in an easy-to-prepare snack

INVOLVE FAMILY

REWARD
Ticket for the Apes
Frail colorectal cancer patients

Age: median 79 (IQR 74 – 86)
ASA-classification: median 3 (IQR 2-3)
Comorbidities: cardiac (10), lung (1), diabetes (5)
Living alone: 5
ADL-dependent: 12
Malnourished: 9
Results: Feasibility

- **100% completion rate**
- **Exercises 6 / 7 days a week**
- **Recipes 5 / 7 days a week**
- **Fit4SurgeryTV easy to use**
- **At-home exercises preferable**
- **Physical improvement**

Average duration program: 26 days
Prehabilitation in older patients

**Focus** on the frail patient

**Adjust** the program to the capabilities of the elderly patient

**Integrate** the program into the daily life of the patient

**Choose for** validated outcome measures

**Measure** compliance + effect
**Personal view**

- It is better to continuously rehabilitate then just for the moment you have to undergo surgery

- Surgery can be seen as an opportunity to change life style

- The compliance in prehabilitation is probably predictive for the compliance in postoperative rehabilitation and is therefore a prerequisite for surgery
Future directions prehabilitation

- Measurements of resilience besides frailty (status after training)
- Take baseline level and compliance into account
- Standardize frailty measurement to promote collaboration
- Include older adults with cognitive impairment, involve caregivers / family
- Investigate cost-effectiveness
b.c.van.munster@umcg.nl