The effect of prehabilitation programmes in major abdominal surgery: A systematic review

Alison Luther, Joseph Gabriel, Richard Watson & Nader Francis

ERAS-UK conference
4th November 2016
Major abdominal surgery

• High risk
  – 35% patients have complications
  – Affect on functionality

• Complications and reduced functionality have long term effect on survival
Determinants of Long-Term Survival After Major Surgery and the Adverse Effect of Postoperative Complications

Impaired functional capacity is associated with all-cause mortality after major elective intra-abdominal surgery

Department of Anaesthetics, York Hospital, Wigginton Road, York YO31 8HE, UK

**Fig 3** Kaplan–Meier curve for 90 day survival for VE/VCO₂ compared with VE/VCO₂ >34. Survival at 90 days was significantly greater in patients with VE/VCO₂ <34 (P=0.02).
Minimal pre-operative input

ERAS

- Pre-admission counselling
- Audit of compliance outcomes
- No bowel prep
- Fluid and carbohydrate-loading/no fasting
- No premed
- No NG tubes
- Mid-thoracic epidural anaesthesia/analgesia
- Short-acting anaesthetic agent
- Warm air body heating in theatre
- Short incisions, no drains
- Avoidance of sodium/fluid overload

- Perioperative oral nutrition
- Early removal of catheters
- Stimulation of gut motility
- Prevention of nausea and vomiting
- Non-opiate oral analgesics/NSAIDs
- Routine mobilisation care pathway

Fearon, Clin Nutr. 2005
Total body Prehabilitation

- Inspiratory Muscle Training
- Exercise
- Nutrition
- Smoking or Alcohol Cessation

Copyright A Luther / ERAS UK
Study aim

To perform systematic review to assess the effect of total body prehabilitation on clinical and functional outcomes in patients undergoing major abdominal surgery
Methods

Defined search terms

AMED, CINHAL, Cochrane database, EMBASE, MEDLINE, PubMed, PsychINFO

3281 citations with 1340 duplications

Applied inclusion/exclusion criteria

Copyright A Luther / ERAS UK
PRISMA Diagram

Article identified through AMED, CINHAL, Cochrane database, EMBASE, MEDLINE, PubMed, PsychINFO
N=3281

Article screened after duplicate removal
N=1941

Full text articles assessed for eligibility
N=28

Articles excluded after abstract review
N=1913
  Full text excluded N=15
  Protocol only =2
  Intervention < 7 days = 5
  Physiological outcome =7
  Other surgery types included = 1

Articles included in systematic review
N=13

Copyright A Luther / ERAS UK
Results

• 13 papers identified
  – 7 RCT, 1 nR CT, 5 cohort studies
• Duration of intervention ranged from 7 days to 37.6 days (median) pre operatively
• Follow up ranged from 8 days to 3 years post operatively
Types of surgery assessed

- Colorectal: 4
- Upper GI: 6
- Vascular: 1
- All abdominal surgery: 2

Copyright A Luther / ERAS UK
Types of prehabilitation assessed

- Nutrition: 2 papers
- Exercise: 4 papers
- IMT: 4 papers
- Smoking cessation: 2 papers
- Multimodal: 1 paper

Copyright A Luther / ERAS UK
Outcome measures used

- Post operative complications (POC)
- Post operative pulmonary complications (PPC)
- 6 minute walk test (6MWT)
- PPC and 6MWT
- POC and timed-up-and-go test

Number of papers
Significant outcomes compared to intervention

- **Nutrition**: Reduced post operative complications
- **Exercise**: Improved post operative functionality
- **IMT**: No impact
- **Smoking cessation**: Reduced post operative complications
- **Multimodal**: No impact

Copyright A Luther / ERAS UK
Interesting papers

• Li et al – multimodal intervention
• 6MWT at 8 weeks:
  – Intervention group better than original baseline
  – Control still not reached original baseline

• Larger studies (e.g. PREPARE ABC) being planned
Compliance

• Poorly reported
• Mainly reliant on patient self reporting
• Nutrition
  – Burden et al: 72% took 100% nutritional supplementation
• Exercise
  – Carli et al: 16% did prescribed amount of exercise
• Smoking
  – Sorenson et al: 33% stopped smoking completely
Conclusions

• Heterogeneous results

• Is a multimodal intervention best?
  – Like ERAS
  – Could be complementary to ERAS

But....
Conclusions

• Current climate
  – Financial and time demands

• Need pragmatic appropriate intervention
  – Use of wearable technology?

• Best outcome measures?

• Is a feasibility study the next step before committing to large RCT?
Any questions??