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Prehabilitation

Prehabilitation is the process of enhancing a patient's ability to cope with particular stressors. Morbidity and mortality after elective surgery remain significant despite advances in anaesthetic and surgical techniques (Levett et al, 2016). By initiating prehabilitation programmes patients may be more receptive to implementing behavioural and lifestyle changes to improve their perioperative journey.

Mortality after elective surgery stands at 3% in European patients (Levett et al, 2016). Prehabilitation aims to reduce this burden by implementing a series of changes. Smoking and alcohol cessation, nutritional advice and weight loss strategies along with optimization of comorbidities, psychological and exercise programmes form the mainstay of these programmes.

Exercise, the basis of existing prehabilitation programmes, aims to improve a patient's functional capacity through structured regimens including combinations of aerobic, resistance and inspiratory muscle training. Research has shown that exercise programmes are more successful if they offer a multimodal approach combining other facets including nutritional and psychological arms (Gillis et al, 2014). Psychological prehabilitation aims to address the patient's anxiety in order to give realistic postoperative expectations, for example regarding pain management. It is useful in behavioural modification preoperatively, aiding smoking and alcohol abstinence and motivation to engage in exercise programmes.

Evidence shows that smoking cessation more than 4 weeks preoperatively is associated with a reduction in the risk of pulmonary, wound infections and intensive care admissions (Wong et al, 2012). Moreover evidence has not shown an increased risk of pulmonary complications and general morbidity if smoking cessation occurs less than 4 weeks preoperatively. Similarly 4 weeks of alcohol abstinence is associated with a reduction in postoperative morbidity (Tønnesen et al, 2009).

"Prehabilitation programmes may help to attenuate the decrease in functional capacity that occurs after major surgery."

Surgery induces a 'stress response' which activates the hypothalamic–pituitary–adrenal

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axis and sympathetic nervous system, leading to proteolysis and lipolysis providing substrates for gluconeogenesis (Levett et al, 2016). Implementing preoperative nutritional supplementation aims to provide adequate stores to allow for the postoperative catabolic state, thus reducing postoperative morbidity. In fact studies have shown that an obesity paradox exists whereby having an increased body mass index confers a survival benefit (Mullen et al, 2009). However, not all patients with an increased body mass index have a reduced morbidity. Patients with metabolic syndrome are at increased risk perioperatively.

Preoperative anaemia is associated with an increase in postoperative morbidity (Levett et al, 2016). A strategy to improve preoperative haemoglobin levels in patients with iron deficiency anaemia involves oral iron supplementation for at least 2 weeks to reduce the patient's transfusion requirements. Intravenous preparations of iron are potentially more useful now that their risk profile has improved.

Poorly controlled diabetes mellitus is associated with increased morbidity perioperatively. Current recommendations (Membership of the Working Party et al, 2015) suggest that if the level of glycosylated haemoglobin (HbA_{1c}) is greater than 69 mmol/litre, elective surgery should be postponed until better glycaemic control is achieved.

Frailty is an increasing issue facing elective surgery. Exercise prehabilitation is feasible among this population, but further research is required to identify whether prehabilitation programmes improve outcomes after elective surgery.

Conclusions

Surgery is a teachable moment where patients' lifestyle decisions can be challenged and modified. Individualized prehabilitation programmes may help to attenuate the decrease in functional capacity that occurs after major surgery. Currently further research is required to identify optimal programmes and timing of interventions.

Perioperative medicine in a nutshell articles are edited on behalf of Trainees with an interest in perioperative medicine (TRIPOM) (www.tripom.org) by Dr S Sothisrihari, ST7 trainee, London North East.

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