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Review

A systematic review of the nutritional consequences of esophagectomy

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SUMMARY

Background & aims: As improved outcomes after esophagectomy have been observed over the last two decades, the focus on care has shifted to survivorship and quality of life. The aim of this review was to determine changes in nutrition after esophagectomy and to assess the evidence for extended nutrition support.
Methods: A search strategy was developed to identify primary research reporting change in nutritional status a minimum of one month after esophagectomy.
Results: Changes in nutritional parameters reported by 18 studies indicated a weight loss of 5–12% at six months postoperatively. More than half of patients lost >10% of body weight at 12 months. One study reported a persistent weight loss of 14% from baseline three years after surgery. Three studies reporting on longer term follow up noted that 27%–95% of patients failed to regain their baseline weight. Changes in dietary intake (three studies) indicated inadequate energy and protein intake up to three years after surgery. Global quality of life scores reported in one study correlated with better weight preservation. There were a high frequency of gastrointestinal symptoms reported in six studies, most notably in the first year after surgery, but persisting up to 19 years. Extended enteral nutrition on a selective basis has been reported in several studies.
Conclusions: Nutritional status is compromised in the months/years following oesophagectomy and may never return to baseline levels. The causes/consequences of weight loss/impaired nutritional intake require further investigation. The role of extended nutritional support in this population remains unclear.

Contents

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1. Introduction

The incidence of esophageal carcinoma in the Western World is in the range 5–10 per 100,000, with the UK and Ireland having the highest incidence in Europe [1]. In the US, there were an estimated 18,000 new diagnoses of esophageal cancer in 2014 [2] with approximately one third of these patients undergoing esophagectomy [3].

As advances in perioperative care have resulted in improved outcomes in the immediate postoperative period [4,5], the focus on care has shifted to survivorship and quality of life [6]. Nutritional considerations in these patients represent one of the greatest contributors to quality of life [7]. There are manifold reasons for aberrant nutrition after esophagectomy, including altered anatomy, early satiety, loss of appetite, taste and smell, and the post-surgery dumping syndrome [8].

The majority of clinical trials studying nutrition after esophagectomy have focused on the perioperative period, with feeding adjuncts targeted to either the preoperative phase or the immediate (in hospital) postoperative phase [9–12]. These studies have identified minimal or no improvement in clinical outcomes for patients receiving enteral feeding in hospital [9–12]. There has been little written about the potential value of extended nutritional support following discharge from hospital.

There exists a worldwide variation in practice regarding nutritional supplementation after esophagectomy, both in terms of provision and route [10]. Even, within countries there are large geographical disparities. In a review of over 2000 patients undergoing esophagectomy, the 2010 United Kingdom National Oesophagogastric Cancer Audit reported that overall 68% of patients had a feeding jejunostomy placed at the time of surgery [4]. However, the proportion of patients having feeding jejunostomy placed routinely varied between centers from under 25% to in excess of 75% [4].

The aim of this systematic review was two-fold; (1) to determine post hospital discharge changes in nutritional status/intake after esophagectomy, (2) to determine the evidence for the use of extended nutritional support in this population. To be eligible for inclusion, outcome measures had to be reported a minimum of one month after discharge from hospital.

2. Materials and methods

This systematic review followed the PRISMA guidelines [13] and was registered with the Prospero database. It was conducted between October 2014 and April 2015.

2.1. Article selection

To be eligible studies needed to report an objective measures of nutritional status (weight, body mass index, upper arm anthropometry) and, or nutritional intake (energy and protein intakes) after the index hospital admission following esophagectomy. Additional outcome measures, reported in the identified studies that related to nutrition (such as symptoms/quality of life) were also considered. To be eligible for inclusion, outcome measures had to be reported at least one month after hospital discharge. Publications reporting on pooled surgical populations were excluded, where it was not possible to extract information specifically about participants undergoing esophagectomy. The value of preoperative and immediate perioperative enteral nutrition, including immunonutrition has been considered in recent review articles and is not considered in this review [11,12].

2.2. Search strategy

A database search strategy was formulated using subject headings and keyword search terms combined for “esophagectomy” and “nutrition” (encompassing “nutritional status”, “dietary intake” and “nutritional support” terms). Medline, Embase, BNI, CINAHL, and Cochrane databases were systematically searched. Publications were limited to English Language but not year of publication. The reference lists of identified articles and other key review publications were additionally hand searched. The process and inclusion of eligible papers were independently reviewed by MB and DB.

2.3. Assessment of quality: risk of bias

Risk of bias was assessed following guidance from the Cochrane Library [14] with additional information pertaining to selection and attribution bias of non randomised study designs considered with elements from the Newcastle-Ottawa Scale [15] and STROBE [16] statement for reporting observational studies.

2.4. Data extraction

Data was extracted from the included studies by MB and then independently validated by DB,VH and RW. A consensus was reached in areas of controversy.

3. Results

The database search identified 1875 studies of potential interest (including duplication). A further five articles were identified from the bibliographies of retrieved articles (Fig. 1). After full study review, 18 articles met the inclusion criteria and form the basis of this review. There are no randomized controlled trials, 13 descriptive longitudinal studies, and five cross sectional studies. One of the latter studies employed a combination of study designs. Further details of the studies are given in Table 1.

In general, all studies were considered deficient in one or more aspects of their study design/reporting, which increased the likelihood of bias. In terms of selection, no eligibility criteria were reported in two studies [17,26], one prospective study used consecutive patients attending outpatient clinics [18] and all others used convenient samples from defined time periods [19–25,27–33]. Participation rate was reported in 16 of the 18 studies, and ranged between 66 and 100%. No study justified the sample sized used. In terms of attrition bias, five of the 13 studies reported complete outcome data [20,21,26,32,33].

3.1. Changes in nutritional status

Postoperative nutritional parameters, assessed by either change in weight (as a percentage or absolute amount) or body mass index

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