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ORIGINAL ARTICLE

Taste preferences for oral nutrition supplements in patients before and after pelvic radiotherapy: A double-blind controlled study ☆

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Summary
Background & aims: No data exists about the effect of pelvic radiotherapy on taste preference for oral nutrition supplements, including elemental diet, which may prevent gastrointestinal symptoms if taken during pelvic radiotherapy. This double blind study aimed to: (1) examine the palatability of elemental, peptide and polymeric oral nutrition supplements in patients with pelvic malignancies compared with healthy controls (2) assess changes in taste preference following pelvic radiotherapy (3) develop a reliable scale to measure taste preference.
Methods: Subjects blind tasted six 30 ml oral nutrition supplement samples, one duplicated, before and after 5 weeks of treatment (or the same time interval for controls). A Likert scale was used to score preference.
Results: Fifty patients and 50 controls were recruited. Before radiotherapy, patients had a lower mean preference for the peptide formulation than the other oral nutrition supplements ($P<0.001$). There were no significant differences in preferences between patients and controls ($P>0.2$ all supplements). Radiotherapy did not affect supplement preference.

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Conclusions: Patients with pelvic malignancy and healthy controls rate elemental nutritional supplements as highly as polymeric supplements and significantly better than peptide supplements. This trend continues even after pelvic radiotherapy. A Likert scale is a reliable tool in this scenario.

Introduction

One in five patients diagnosed with pelvic cancer will be treated with pelvic radiotherapy.[1] In the UK annually, this amounts to 12,000 patients, and by extrapolating incidence data for these cancers in the USA and Western Europe, it can be estimated that between 100,000 and 150,000 patients undergo pelvic irradiation each year.[2] Side effects occur because healthy tissue cannot be completely excluded from the treatment field. In total, 90% of patients develop acute gastrointestinal symptoms,[3] because the small intestine is particularly susceptible to damage. Symptoms during treatment commonly include diarrhoea, increased stool frequency and bloating.[3,4]

An elemental diet provides all macronutrients in a pre-digested form enabling passive absorption in the small intestine. Fats are supplied in the form of fatty acids, protein as amino acids and carbohydrate as simple sugars. Elemental diet used therapeutically before and during radiotherapy may induce a radio-protective effect for healthy tissues.[2,5] The radio-protective properties of elemental nutrition may be related to reductions in bile acid and pancreatic enzyme secretions[6,7] with this form of nutrition.

Although elemental nutrition may be of therapeutic benefit during pelvic radiotherapy, patients must find the supplement palatable in order for the intervention to be practicable. Supplement preference is affected by a multitude of factors such as taste, colour, smell, after taste and texture. Continual use of a single supplement can result in a patient becoming more accustomed to the flavour; alternatively, monotony and taste fatigue may lead to a reduction in intake.

In the healthy population factors such as genetics, age, weight loss, smoking, alcohol consumption, mouth pain, dentures, and depression are known to influence taste.[8–10] Many disease states, including cancer, and over 250 different medications, are also known to alter taste.[11]

As yet there are no data about the effects of pelvic radiotherapy on taste.

This study has 3 aims. Firstly, to identify whether elemental nutritional supplements are acceptable to patients with pelvic malignancies, compared to peptide and polymeric oral nutritional supplements (ONS) and to compare preferences with healthy controls. Secondly, whether preferences change following treatment with radical pelvic radiotherapy and thirdly, to develop a reliable scale with which to measure taste preference.

Methods

Scale development

A comprehensive literature search of EMBASE and PUBMED retrieved 13 papers which had focused on taste preferences for ONS. Three different visual scales were identified. A visual analogue scale (VAS), a Likert scale and a modified wine tasting scale. No scale had been assessed for both reliability and validity.[12–15]

A 7-point Likert scale (Appendix A) was utilised in the current study as this type of scale had been found to be reliable.[14] If a supplement was rated more highly, it was given a higher score (minimum score 1, maximum score 7).

Supplement selection

Five nutritionally complete oral supplements were assessed: Elemental 028 (E028) extra liquid, E028 extra sachet and Emsogen are elemental formulae (SHS International). Fortijuice (Nutricia) is a polymeric formula and Peptamen (Nestlé) is a peptide formula. Similar flavours of each ONS were selected for testing: four lemon and lime and one orange and pineapple flavour were used.

Statistical rationale

Sample size calculation was based on published data which had investigated preferences for high energy foods using a Likert scale.[14] With a standard deviation in scores of 1.3, we could detect a difference of 0.8 in Likert scores, with a power of $>80\%$ (2 sided, alpha $= 0.05$) if 50 patients and 50 controls were recruited.