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headandneck
5000

Trajectory, determinants and sequelae of speech, voice and swallowing in people with head and neck cancer

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Scientific Outline

Summary

Introduction

The growing number of cancer survivors has stimulated research seeking to better understand survivors' experiences of living with cancer. It is recognised that current health services fail to adequately meet their needs. Head and neck cancer and its treatment can have major impacts on a range of key functions, including breathing, speech and swallowing. Although some of these functional limitations improve in the months after treatment, others persist longer term and can have a profound impact on survivors' lives. Most previous studies on the functional consequences of head and neck cancer have been small (typically including around 200 survivors). Larger studies are required to: support shared-decision making around treatment, better prepare patients and their families for life after treatment, provide more accurate information for head and neck cancer clinicians and - ultimately - to inform service development to ensure that the needs of survivors are met. The aim of this project is to investigate functional limitations in a large population of head and neck cancer survivors, including examining how these vary over time and by patient subgroups and whether they are related to psychological wellbeing

1) Dysphagia

Dysphagia is one of the most common side effects of head and neck cancer treatment, with swallowing ability being a priority for patients. Dysphagia is an independent predictor of survival and is associated with higher risk of pneumonia, poorer oral intake, prolonged tube feeding, weight loss as well as fundamental changes to eating patterns, social life, mood and consequently poorer quality of life. In light of this, much work has focused on devising strategies to reduce treatment toxicity, maintain swallowing function and develop interventions to remediate long term dysphagia.

Findings suggest that factors affecting post-operative dysphagia severity include tumour site, volume resected and nature of the reconstruction. Many patients will go on to have adjuvant radiotherapy, or may have had primary radiotherapy followed by salvage surgery, adding to the detrimental effect on swallowing.

Dysphagia is a common side effect of (chemo) radiotherapy. Data taken from an American cancer registry (n=407), makes a conservative estimate of up to 60% of patients affected. Following radiotherapy, tissues can become fibrotic, atrophic, insensate and remain oedematous,

significantly affecting the movement and co-ordination necessary for safe and efficient swallowing. At worst, the end result may be a dysfunctional larynx associated with complex swallowing and airway issues, requiring laryngectomy. Xerostomia and dysgeusia further impact on the eating and drinking experience. From small studies predictors of radiation-induced dysphagia include pre-treatment swallowing function, total radiation dose, target volumes, treatment delivery techniques and concurrent chemotherapy.

2) Communication

The impact of changes to communication (i.e. voice / speech) can be profound, creating social anxiety, isolation and frustration. Hoarseness is a frequent symptom of laryngeal cancer at diagnosis and treatment has direct effects on voice quality due to anatomical changes, scarring, oedema. Patient interviews show that following radiotherapy, it takes more energy to speak, can be uncomfortable due to dry mouth and numerous adaptations are necessary. Patients with alterations to their airway i.e. laryngectomy or tracheostomy endure significant changes to voice production. For some, they may depend on alternative methods / aids for communication. Prospective studies on voice outcomes for non-laryngeal head and neck cancer survivors are limited. Voice and speech changes following chemoradiotherapy present in up to 2/3rds of survivors. Preliminary work shows that this treatment has a significant effect on the patients' self-reported voice quality, including reduced stamina and volume, fatigue, limited pitch range, singing voice.

Tumours of the oral and oropharyngeal cavity and their treatment can inhibit the movement (pain or nerve destruction), reduce space (oedema / space occupying lesion) and the feedback (sensory loss, nerve destruction) essential for fine articulatory movements involved in speech production. Soft palate involvement can lead to major changes in nasal resonance. A large proportion of patients with have under gone structural changes, ranging from dental extractions to large defects requiring complex reconstructions or a prosthetic devices. Accruing adequate numbers of patients, under-going similar surgical procedures is a challenge for single centres due to insufficient numbers.

Aim

The aim of this project is to investigate functional limitations (speech / voice / swallowing) in head and neck cancer survivors:

1) To investigate the trajectory of functional limitations in speech, voice and swallowing in the first year following HNC diagnosis and treatment.

2) To investigate predictors of short (4 month) and longer-term (one year) patient reported functional outcomes. Changes to function are unlikely to be explained by a single factor. We have identified several potential explanatory variables which we propose to examine: baseline function, patient socio-demographics and lifestyle behaviours, disease characteristics, treatment type, co-morbidities,

3) To explore the impact of patient-reported changes to/limitations in function on psychological wellbeing

Methods

Sample:

From the HN5000 dataset, extract patients diagnosed with cancer of the pharynx, larynx, mouth and salivary glands.

Explanatory variables:

Patient demographics: date of birth/age at diagnosis, gender, education, income. Lifestyle: smoking, alcohol. Disease characteristics: tumour site, TNM staging, HPV status. Co-morbidity index. Cancer plan intent. Type(s) of treatment

Outcome Measures:

EORTC QLQ-C30 and EORTC QLQ H&N35 (include total score and sub-sections), HADS: all at pre-treatment, 4 month, 12 month

Analysis

Tests of trend will be used to compare crude functional outcome scores at baseline, 4-months and 12-months. For the analysis of predictors of functional outcome, initially the 4 month and 12 month time points will be analysed separately. Associations between potential explanatory variables and EORTC subsection scores will be examined using z-tests or ANOVA, as appropriate. Inter-relationships between potential explanatory variables will be explored using descriptive statistics, in order to understand collinearity. Multivariable linear regression will be used to identify which variables are associated with the outcomes of interest when adjusted for other variables, separately for the 4-month and 12-month outcomes. Subsequent analyses may go on to use generalised estimating equations to examine changes in functional outcomes over time, when adjusted for other variables. For the analysis of the HADS data, for the 4-month and 12-month time-points separately, patients will be categorised as "cases" or "non-cases" on each subscale, using recommended cut-offs (i.e. 8/11). Multivariate logistic regression (or, if ≥20% of patients are defined as cases, modified Poisson regression with a robust error variance) will be used to determine associations between functional outcomes and (a) depression and (b) anxiety, adjusting for other variables.