

Voice Rehabilitation and Functional Outcomes Following Radiotherapy for Laryngeal Cancer

AKADEMISK AVHANDLING

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien vid Göteborgs
Universitet kommer att offentlig försvaras i hörsal Arvid Carlsson, Medicinaregatan 3, Göteborg,
fredagen den 12 december 2014 kl. 13.00

av

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Legitimerad logoped

Fakultetsopponent:

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Lunds Universitet, Lund

Avhandlingen baseras på följande delarbeten:

- I. Tuomi, L*. Karlsson, T*. Johansson, M. Finizia, C. Health Related Quality of Life and Voice after Radiotherapy for Laryngeal Cancer: A Comparison Between Glottic and Supraglottic Tumours. *Acta Oncologica* 2014; Jun 10:1-7
- II. Tuomi, L. Andréll, P. Finizia, C. Effects of Voice Rehabilitation After Radiation Therapy for Laryngeal Cancer: A Randomized Controlled Study. *International Journal of Radiation Oncology Biology Physics* 2014;89(5):964-72
- III. Tuomi, L. Johansson, M. Andréll, P. Finizia, C. Interpretation of the Swedish Self Evaluation of Communication Experiences after Laryngeal cancer (S-SECEL): Cut-off Levels and Minimum Clinically Important Differences. Submitted and under revision
- IV. Karlsson, T*. Tuomi, L*. Johansson, M. Andréll, P. Finizia, C. Effects of Voice Rehabilitation after Radiotherapy for Laryngeal Cancer: A Longitudinal Study of Voice Quality and Health Related Quality of Life. Submitted

* Shared first authorship

Göteborg 2014



GÖTEBORGS UNIVERSITET

Voice Rehabilitation and Functional Outcomes Following Radiotherapy for Laryngeal Cancer

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ABSTRACT

The overall aim of this thesis was to evaluate the effects of radiotherapy treatment and voice rehabilitation on voice function and health related quality of life (HRQL) following treatment for laryngeal cancer.

Patients treated for laryngeal cancer were prospectively studied pre-radiotherapy and 1, 6 and 12 months post-radiotherapy. Patients were randomized into a voice rehabilitation group, in which they received voice rehabilitation between 1 and 6 months post-radiotherapy, or a control group. Patient reported outcome (PRO) measures included the S-SECEL (Swedish Self-Evaluation of Communication Experiences after Laryngeal cancer), EORTC QLQ (European Organization for Research and Treatment of Cancer Quality of Life Questionnaire) and questions regarding hoarseness and vocal loudness. Acoustic, perceptual and temporal analyses were performed. The patients were also compared to a vocally healthy control group.

After radiotherapy, a general deterioration of HRQL was observed in all patients treated for laryngeal cancer, the supraglottic cohort generally had inferior scores compared to the glottic cohort. Regarding voice quality, the glottic cohort appeared inferior to the vocally healthy control group both pre- and post-radiotherapy, while the supraglottic cohort was comparable to the vocally healthy control group.

According to the S-SECEL results, improvement was seen in the voice rehabilitation group, results were maintained at the follow-up six months later. The control group had no statistically significant change in S-SECEL results. No statistically significant changes regarding acoustically measured voice quality were present in the short- or long-term follow-up. HRQL measures according to the EORTC improved after voice rehabilitation and remained at follow-up 6 months later. The control group showed no statistically significant change except for the Social function domain, which improved from baseline to 6 months post radiotherapy. Perceptually assessed roughness did not change during voice rehabilitation, however, a statistically significant deterioration was present for the control group between 6 and 12 months post-radiotherapy. Factors increasing the likelihood of communication improvement 12 months post radiotherapy were voice rehabilitation, poor speech scores and experiencing less voice use one month post-radiotherapy compared to pre-radiotherapy. Smoking affected communication negatively.

In order to facilitate clinical interpretation of the S-SECEL, cut-off values as well as estimates of minimum clinically important differences (MCID) were identified for the instrument. Laryngeal cancer patients filled out the S-SECEL instrument and a question about acceptability of speech in a social context pre- and 12-months post oncologic treatment. Results at 12 months as well as the change between pre- and 12-months follow-up were used for identification of cut-off values and estimates of MCID for each domain of the S-SECEL. When using the cut-off value, 36 % of the participants scored above that value indicating the need for vocal rehabilitation at the 12-month follow-up.

The results of this thesis demonstrate that voice function and HRQL is affected after radiotherapy. A large proportion had communication functioning indicating the need for vocal rehabilitation. Voice rehabilitation prevented voice deterioration and improved the self-perceived communication function and HRQL. The effects remained in the long-term. The findings suggest that voice rehabilitation could be beneficial to patients after radiotherapy for laryngeal cancer. Additionally it raises the importance of monitoring the communication and voice function through self-assessment and voice recordings.

Keywords: voice quality, voice training, laryngeal neoplasms, patient outcome assessment, quality of life, radiotherapy

ISBN: 978-91-628-9144-2 (printed), 978-91-628-9145-9 (electronic)

<http://hdl.handle.net/2077/36744>