Nasal Airflow-Inducing Maneuver (NAIM) rehabilitation in laryngectomized patients

1-3 year follow-up study

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ABSTRACT

Objective: To assess the long-term results of the Nasal Airflow-Inducing Maneuver (NAIM) olfaction rehabilitation in patients with laryngectomy according to changes in olfaction, health-related quality of life (HRQL) and communication.

Methods: University hospital setting. A new method, the NAIM technique is now available for laryngectomized patients to regain the ability to smell. Of the 18 laryngectomized patients compared with an age and gender matched control group with laryngeal cancer treated with radical radiotherapy. HRQL was assessed by the Scandinavian Odor-Identification Test (SOIT), olfactory and taste; score (8-40); Appetite (6-30); POPS (3-15); Present state of smell compared to pretreatment.

Results: Thirty-six months after NAIM rehabilitation 14 of 18 laryngectomized patients (78%) were smellers according to SOIT results. This may have serious health-related quality of life (HRQL) and communication.

Conclusions: Patients who were successfully rehabilitated concerning olfaction and communication had an overall good HRQL and no mental distress.

INTRODUCTION

Total laryngectomy results in deterioration of pulmonary function and major decrease in sense of smell, as a consequence of the permanent disconnection of the upper and lower airways. This may have serious health-related quality of life (HRQL) and communication.

NAIM technique with water-monometer for visual feedback

METHODS AND MATERIALS

Eighteen laryngectomized patients (15 males and 3 females; mean age 71 years), rehabilitated with NAIM, longitudinally followed for 3 years and compared with an age and gender matched control group with laryngeal cancer treated with radical radiotherapy.

Intervention: NAIM-rehabilitation with 3 interventions within 6 weeks and followed up at 6, 12 and 36 months after intervention.

Main outcome measure: Scandinavian Odor-Identification Test (SOIT), olfactory and quality of life questionnaires. The patients were categorized as smellers or non-smellers based on the SOIT results.

Olfactory impairment is common in laryngectomized patients and improves the capacity to smell and taste. Patients who were successfully rehabilitated concerning olfaction and communication had an overall good HRQL and no mental distress.

The NAIM technique is a patient-friendly, inexpensive and effective method for restoring the sense of smell in patients after laryngectomy, and the results persist in the long term.

The NAIM rehabilitation should be incorporated into routine rehabilitation programs for laryngectomy patients.

RESULTS

• 14 of 18 laryngectomized patients (78%) were smellers according to SOIT results.

• With one exception (sleep disturbances), no clinically or statistically significant differences between the study and the control group concerning changes in communication.

• Olfactory impairment is common in laryngectomized patients.

• The NAIM method is easy to learn and rapidly improves the capacity to smell and taste.

• Patients who were successfully rehabilitated concerning olfaction and communication had an overall good HRQL and no mental distress.

• The NAIM is a patient-friendly, inexpensive and effective method for restoring the sense of smell in patients after laryngectomy, and the results persist in the long term.

• The NAIM rehabilitation should be incorporated into routine rehabilitation programs for laryngectomy.

CONCLUSIONS

• Olfactory impairment is common in laryngectomized patients.

• The NAIM method is easy to learn and rapidly improves the capacity to smell and taste.

• Patients who were successfully rehabilitated concerning olfaction and communication had an overall good HRQL and no mental distress.

• The NAIM is a patient-friendly, inexpensive and effective method for restoring the sense of smell in patients after laryngectomy, and the results persist in the long term.

• The NAIM rehabilitation should be incorporated into routine rehabilitation programs for laryngectomy.

Abbriviations

CI, confidence interval; a = SOIT, Scandinavian Odor-Identification Test. Score range, 11-16 for normosmia, 8-10 for hyposmia, and <7 for anosmia; b = Patients’ self-estimation; 0 corresponds to worst perceived smell and taste; c = QOTA; Taste, score (8-40); Appetite (6-30); POPS (3-15). Present state of smell compared to pretreatment.

Olfaction rehabilitation with the Nasal Airflow-Inducing Maneuver (NAIM): “Polite yawning”: nasal airflow creates a negative pressure in the oral cavity and oropharynx. This is attained by lowering of the jaw, floor of mouth, tongue, base of tongue and soft palate while the lips are closed.

Score changes from pretreatment (baseline) to 36 months posttreatment in study population and control patients

Mean (95% CI) Score

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Study population</th>
<th>Controls</th>
<th>p value</th>
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<tbody>
<tr>
<td>Pretreatment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline</td>
<td>7.2 (5.9)</td>
<td>7.5 (5.9)</td>
<td>.03</td>
</tr>
<tr>
<td>6 mo</td>
<td>9.5 (7.1)</td>
<td>10.5 (9.3)</td>
<td>.003</td>
</tr>
<tr>
<td>36 mo</td>
<td>13.6 (11-14)</td>
<td>14.5 (11.5)</td>
<td>.001</td>
</tr>
<tr>
<td>Patients’ self-estimation</td>
<td>25.9 (12-40)</td>
<td>25.0 (12-40)</td>
<td>.07</td>
</tr>
<tr>
<td>Present olfaction</td>
<td>67.6 (51-84)</td>
<td>75.5 (60-89)</td>
<td>.07</td>
</tr>
<tr>
<td>Present gustation</td>
<td>67.6 (51-84)</td>
<td>75.5 (60-89)</td>
<td>.07</td>
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</tbody>
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Clinical significance: Positive change in olfactory ability, defined as a 20% (0.5) or more improvement from pre-treatment to post-treatment.

Briefer score indicates bad function or deterioration of these compared with the pretreatment situation.

Olfactory impairment is defined as a patient not being able to detect wasted food, smoke or leaking gas. Some patients have tried to improve smell by using a so-called larynx bypass, in which airflow from the stoma is directed to the mouth, creating an artificial airflow into the nose. However a method is not ideal in day-to-day life. Recently a patient friendly method that can restore the sense of smell (and taste) in laryngectomized patients has been developed by Hilgers and his co-workers. This olfaction rehabilitation technique, Nasal Airflow-Inducing Maneuver (NAIM) or “polite yawning” was tested in a Swedish study and the sense of smell was improved in 13 (72%) of these 18 patients with anosmia or hyposmia after 6-weeks olfactory rehabilitation with the NAIM technique.