Critical Review:
In patients with total laryngectomy, is gender related to quality of life outcomes?

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Total laryngectomy is a procedure which causes myriad physical changes and can significantly impact quality of life. While historically more men have undergone this procedure, the demographics are changing. This critical review examines the differences in quality of life and voice handicap outcomes of males and females who have undergone total laryngectomy. A literature search using computerized databases was completed resulting in four experimental studies and one informational review that met the inclusion criteria. These five articles were critically appraised to evaluate their level of evidence and validity. Overall, the research provided compelling evidence that there is a significant difference in quality of life outcomes for males and females, and suggested some specific quality of life dimensions that differentially impact the two groups. The articles were not in agreement on the impact of gender on degree of voice handicap following laryngectomy. Considerations for future research and clinical implications for post-laryngectomy rehabilitation are discussed.

Introduction

Treatment for laryngeal cancer may involve multiple approaches, including surgery, radiation, or a combination of both. In cases of advanced disease, the most effective treatment is total laryngectomy (TL), which requires removal of the entire larynx and often surrounding structures. This procedure causes numerous anatomical and physiological changes, one of which is the loss of voice and speech. Fung and Terrell (2004) reported that these changes negatively influence psychological and social well-being, as well as post-laryngectomy quality of life (QOL). Similarly, Armstrong et al (2001) found in a longitudinal study that those who have undergone TL have persistent difficulties with speech, swallowing, and social/emotional adjustment.

Laryngeal cancer has historically had a higher incidence in the male population; however, this statistic is changing. While the incidence of male laryngeal cancer is decreasing, the same is not true for the female population (Lee, Gibson, & Hilari, 2010). Due to the predominantly male laryngectomee population, much of the literature on TL arises from a predominantly male subject population. Subsequently, post-laryngectomy treatment and rehabilitation tends to be defined by this research (Brown & Doyle, 1999). Gijsbers, Vanwijk, Van Vliet, and Kolk (1996), however, reported that when men and women are affected by the same health problems, they may experience them differently. It would follow from this that factors related to outcomes of post-laryngectomy rehabilitation might differ for the male and female genders.

There are three options for post-laryngectomy, or alaryngeal, speech. These are esophageal speech (ES), tracheoesophageal speech (TE), and electrolarynx (EL). While all three methods can be highly functional and intelligible, all three methods have abnormal perceptual characteristics and therefore have the potential to negatively impact QOL. Voice handicap is one aspect of QOL that is specific to communication. It refers to the functional, emotional, and psychosocial consequences of a voice disorder (Jacobson et al., 1997). Alaryngeal speech poses unique challenges for the speaker, which can result in a greater degree of voice handicap. For example, an acoustic analysis by Kazi et al. (2006) found that gender frequency differences are lost following TL for TE speakers. The TE voice is perceptually more similar to the normal male voice, which could result in a greater voice handicap for female TE speakers. In addition to voice handicap, researchers have also examined the impact of laryngectomy on overall QOL, which encompasses psychological, physical, social, and emotional well-being. Early studies of laryngectomy gender differences reported that the use of alaryngeal voice affected the confidence of women more than men. (Gardner, 1966). Gardner also reported that female laryngectomees suffer from more concerns related to body image.

The impact of gender on QOL following TL has implications for post-laryngectomy rehabilitation. Therefore, it is important to examine the existing literature to identify whether gender influences voice handicap and overall QOL outcomes, and if so, which dimensions differ between male and female groups. In this review, the term “laryngectomee” is used to refer to an individual who has undergone TL.

Objectives

The objective of this paper is to critically review the literature in order to discover whether voice handicap and overall QOL outcomes are influenced by gender for individuals who have undergone TL.

Methods

Search Strategy

Computerized databases including PubMed, PsycInfo, and CINAHL, as well as Google Scholar, were used to find journal articles. The following search terms were used: (laryngectomy) OR (alaryngeal speech) AND (gender) OR (female) AND (quality of life).

Selection Criteria

Studies selected for this review were required to report QOL data specific to patients who had undergone TL. The papers selected had either a comparison between male and female groups or focused on the specific needs of the female laryngectomee population.

The selection process excluded two papers that studied participants from outside of North America and Europe. This was deemed necessary due to cultural and social differences in the experiences of women around the world.

Data Collection

Results of this search yielded five articles. Of the five articles, four are experimental studies and one is an informational review.

Results

Experimental Studies

Lee, Gibson, and Hilari (2010) conducted a between-groups study comparing males and females who had undergone TL on two measures of overall QOL. A group of 43 participants (22 males and 21 females) completed QOL questionnaires. Results of the study indicated that significantly more females lived alone and experienced a change in employment status following TL. Males experienced higher QOL than did females, with significantly higher levels of physical, emotional, cognitive, and social functioning. After demographic differences were controlled for, there was still a significant difference between groups for emotional and social functioning.

The eligibility criteria for this study were reported in detail. Participants were all TL patients who were over 50 years of age, at least one-year post-surgery, disease free, English speaking, with functional hearing and vision. The study was advertised in newspapers and laryngectomy clubs across England and Scotland. This provided a controlled and representative sample for the study. The questionnaires that were chosen had adequate reliability, validity, and cross-cultural applicability based on past research. Both were widely used instruments for measuring QOL in laryngectomees.

Appropriate statistical analyses were completed to compare male and female groups. One caution warranted relates to the large number of statistical tests completed. Completing multiple statistical tests raises the possibility for a type I error.

Overall, this article suggests that there are several potentially negative QOL outcomes that affect females to a greater extent than males. When other differences were controlled for, females experience more difficulty with emotional and social functioning following TL. This study presents compelling evidence that QOL outcomes are influenced by gender following TL.

Graham and Palmer (2002) explored whether gender was associated with rehabilitation needs in laryngectomees. They used a cross-sectional between-groups study with a self-made questionnaire, which was completed by 110 female and 129 male laryngectomees. Results indicated that while there were many similarities between the two groups (e.g., participation in counselling and psychotherapy, methods of alaryngeal speech used, perception of communication success), there were also some notable differences. A greater number of females than males indicated postoperative physical complaints, and females also indicated less satisfaction with the information provided from their physician or surgeon. Additionally, the female group was more likely to depend on friends, family, and other non-laryngectomized groups for support, whereas the male group preferred to participate in laryngectomee clubs. Although not all variables examined were direct measures of QOL, the findings suggest that men and women have different needs and preferences for their post-surgery rehabilitation, which have the potential to indirectly impact QOL.

A strength of this study was the large sample size used. The researchers mailed their questionnaire to 520 random individuals from the International Association of Laryngectomees mailing list, with an equal number going to males and to females. Of the 361 that were returned, 239 met the inclusion criteria. A second strength of this study was the self-made questionnaire that was used. The contents were based on a literature review of alaryngeal speech rehabilitation including QOL indicators. The questionnaire was tested with a

pilot study before distribution. This helped ensure acceptable validity of the questions.

One caution warranted for this study is the paucity of statistical analysis performed with the questionnaire data. While the article mentions an analysis of correlations, there is no information provided on the type of analysis performed or the results of this analysis. The results section indicated differences between the male and female groups; however, the lack of statistical data prevents the reader from determining whether these differences are of statistical significance.

Overall, this study identifies several potential differences between male and female laryngectomees that may have implications for each group's unique rehabilitation needs. The researchers provide suggestive evidence that females have more physical complaints, less satisfaction with post-operative information provided, and have different preferred methods of support following TL. They also provide evidence that there are similarities between the two groups. It should be noted that indicators employed in this study were arguably related to QOL (e.g., physician satisfaction) but may not be direct measures of psychological and social well-being. Given this, and also due to the lack of statistical analysis reported on this data, the results should be interpreted with caution.

Moukarbel et al. (2010) used retrospective data to examine the voice handicap in TL patients for each of the three alaryngeal speech methods. They used a mixed between-groups design to compare these three groups, as well as the influence of gender within and between groups. Results reported no significant differences between the male and female populations.

This study had 75 participants, 51 men and 24 women. The participants had previously completed a QOL questionnaire, which measured the degree of vocal handicap experienced by the patient and has had its validity and reliability proven in numerous prior studies, including studies of alaryngeal speech outcomes (Kazi et al., 2005). However, this questionnaire is limited to voice-specific variables and does not measure overall QOL. The gender analysis was completed using appropriate statistical tests. Men and women were compared both within each group (EL, ES, TE) as well as across the entire population. No significant differences were found between or within groups with respect to gender. One limitation of this study is the low number of women who completed the questionnaire. The 2:1 ratio of men to women may limit the accuracy of the findings.

Overall, this study reports no gender differences for voice handicap in laryngectomized individuals. This provides suggestive evidence that male and female laryngectomees do not differ significantly in their QOL specific to voice. It also suggests that voice handicap is similar in males and females regardless of the alaryngeal speech method used. However, due to the small number of women included in the study, caution should be taken before considering clinical implementation of these findings.

Kazi et al. (2006) conducted a cross-sectional cohort study to examine the multidimensional aspects of female TE speech. In addition to an acoustic analysis and perceptual analysis, this included measures of voice handicap and overall QOL. The data from female laryngectomees was compared to that of male laryngectomees and female laryngeal speakers. Results reported a significant difference between males and females on a voice handicap questionnaire, with females reporting a higher degree of handicap. On the overall QOL measure, females identified speech and appearance as the 'most important' issues; however, there was no significant difference in overall scores on this QOL questionnaire between the male and female groups.

The participants for the QOL portion of this study included 10 female laryngectomees and 10 male laryngectomees, which is a relatively small sample. The measures used were two existing questionnaires. Both have acceptable reliability and validity based on past research. The results were analyzed using appropriate statistical analyses. Significant differences indicating a greater voice handicap for females was found on a measure of voice handicap but not the overall QOL questionnaire. The researchers noted that their small sample size may have limited the accuracy of their analyses.

Overall, this study provides suggestive evidence that female laryngectomees experience a greater amount of voice handicap following TL than do males. It also identifies two possible QOL areas that may impact females more than males – speech and appearance. It would be beneficial to attempt to replicate this study with a larger sample size before adopting this information into clinical practice.

Informational Review

Cox, Theurer, Spaulding, and Doyle (2015) published an informational review of the multidimensional impact of TL on women. The specific dimensions examined were physical, psychological, and social functioning leading up to and following TL. The authors concluded that women are at increased risk of social penalty due to

unsuccessful reintegration into society following surgery. This difficulty is perpetuated by changes associated with physical disfigurement, voice quality, and psychological functioning. Additional factors such as financial strain, addictive behaviours, and withdrawal from social support further expand the potential for TL to differentially influence women.

The method of this review was to examine the multidimensional impact of TL through the framework of the International Classification of Functioning, Disability, and Health (ICF). This framework provides a biopsychosocial lens that guides examination of the interactions between physical functioning, participation in daily activities, personal factors, and environmental contexts (World Health Organization, 2001). Although not a systematic review, this paper includes references to relevant papers in the area and was written by noted experts in the field.

This review provides compelling evidence of the differential impact of TL on QOL for men and women. It examines a broad body of literature relating to the experience of male and female laryngectomees and suggests areas that may facilitate or impede a woman's rehabilitation and reintegration into society following TL. Opportunities for future research are identified.

Discussion

Overall, the findings from these studies indicate that the experiences of male and females can be very different following TL. The evidence suggests some possible dimensions of overall QOL which may be experienced differently by men and women, such as physical appearance, social support and reintegration, and emotional and psychological functioning. However, the articles were not in agreement on the whether there were significant differences specific to voice handicap. One study which examined post-laryngectomy voice handicap did not find significant differences between men and women, while another article found differences for voice handicap, but not overall QOL. Therefore, future research is warranted.

Future Research Considerations

Because of the nature of studying differences between men and women, there are inherent limitations on the forms of research that can be used. However, between groups studies such as the ones mentioned above can provide valuable information on the QOL of both genders following this procedure. In order to strengthen the level of evidence, the following recommendations should be considered for future research:

a) Future research studies should incorporate large sample sizes to increase the confidence of clinical implementation.

b) Researchers should utilize appropriate statistical analyses when examining QOL data in order to determine the significance of their findings.

c) When examining the differences between men and women, researchers should ensure the size of both groups is equal and control for other factors which may influence QOL, such as demographics and treatment variables.

Clinical Implications

Although the level of evidence provided above may be limited in strength, the articles provided important findings which should be taken into consideration during clinical decision-making. While it may not be clear what specific dimensions are experienced differently by female laryngectomees, there is compelling evidence to suggest that there are significant differences in QOL outcomes. Therefore, clinicians should consider the specific and individual needs of women who have undergone TL during their rehabilitation process. As well, continued research is recommended in order to obtain a clearer understanding of the nature of differing QOL outcomes in male and female laryngectomees.

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