Quality of life after treatment for acoustic neuroma using the new PANQOL Scale

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Abstract

Objectives: To compare quality of life in acoustic neuroma patients undergoing different treatment algorithms using the PANQOL scale, a new validated and disease-specific quality of life tool. Conventional self-reported outcome measures are inadequate for assessing the impact of acoustic neuroma surgery, which is associated with significant morbidity and can significantly reduce quality of life in the short and long term. Methods: One hundred forty-four patients with acoustic neuromas and 40 general otolaryngology controls completed the 26 question PANQOL scale and the SF-36 generic health related quality of life scale at a single time-point to a diverse mix of patients with acoustic neuromas. Most patients were being managed conservatively (78%) with serial MRI imaging. Follow-up times varied widely, and were as long as 7 years in some surgical patients. Our study showed few relationships between PANQOL scores and patient or tumor characteristics, consistent with most other published studies. 7 Our multivariate analysis showed a correlation between larger tumor size and worse PANQOL scores in conservative and gamma knife groups, but no such correlation appeared in the microsurgery group. Our study, however, did not specifically separate intracanalicular tumors from others. Comparing PANQOL scores between groups, only the face domain showed a significant difference and was worst in the microsurgery and best in the conservative group. In contrast, the SF-36 did not capture any significant differences between groups. There was a trend towards worse pain in the microsurgery group (p = 0.07, ANOVA). There is a trend towards worse pain in the microsurgery group compared to surgery, which may reflect pre-treatment decisions to avoid surgery on sicker patients who still require some intervention for their tumor. Several other studies have shown better discrimination of pain scores in patients undergoing primary open or gamma knife compared to surgery, but these were not randomized prospective studies.8 Others have pointed out the increased risks of malignant transformation after gamma knife treatment.9

The PANQOL scale captured significant differences between cases and controls that were not evident from SF-36 scores. The balance and hearing domains of the PANQOL were significantly lower in all treatment groups compared to the controls. The majority of studies employing different health scales did not appreciate any quality of life differences between conservatively managed patients and controls.10

The main limitation of this study is the fact that it is a cross-sectional observational study and relatively small in size. Patient perceived quality of life is expected to change over time, and a study like this cannot accurately capture such differences. With microsurgery groups in particular, quality of life will likely change dramatically (e.g., loss of hearing, change in surgical avenue), and such studies are necessarily limited in their scope. Larger prospective studies with long-term follow-up would be useful in comparing patient expectations and quality of life measures with the same post-treatment measures. It is difficult to draw firm conclusions about the quality of life in acoustic neuroma patients, but it is an important first step in the evaluation of disease-specific quality of life in this complex disease process.

It is important to note that the existence of a disease-specific QOL measure for AN does not preclude the concurrent use of generic instruments in QOL studies. Generic instruments allow for broader comparisons between different disease states and patient populations, but are typically less responsive to change over time specifically. Disease-specific scales, conversely, do not allow for easy comparisons across disease states but are typically more responsive to change and provide more relevant information to clinicians.7 Many authors recommend the side-by-side use of both types of instruments.15

Conclusions

Individual PANQOL domain scores showed important correlations with patient and tumor characteristics that were unique to different treatment groups. Only PANQOL hearing and balance scores showed significantly worse in cases compared to controls. The PANQOL scale should prove useful in future prospective studies.

References

5. Shaffer BT, Cohen MS, Bigelow DC, Ruckenstein MJ. Validation of a Disease-Specific Quality of Life Instrument for Acoustic Neurinoma: The PANQOL Scale. Accepted for publication. Laryngoscope, Feb 2016.

Results

Patient demographics are shown in Table 1. Of the 157 patients who responded, 45% were managed conservatively with serial MRI imaging. 17% underwent gamma-knife radiosurgery, and 38% underwent microsurgery. In the microsurgical group, a retroauricular approach was the most common approach used. There was no significant difference in any domain in the entire group. The SF-36 did not capture any significant differences between the treatment groups. All treatment groups had significantly lower PANQOL hearing and balance scores compared to controls. Acoustic neuroma cases had a significantly better PANQOL general health score compared to general otolaryngology controls. Conservative management cases showed an inverse correlation between tumor size and PANQOL face pain scores. Gamma knife cases showed an inverse correlation between tumor size and PANQOL pain scores. Our study showed few relationships between PANQOL scores and patient or tumor characteristics, consistent with most other published studies. 7 Our multivariate analysis showed a correlation between larger tumor size and worse PANQOL scores in conservative and gamma knife groups, but no such correlation appeared in the microsurgery group. When we separated tumors into those greater than 1cm and those less than or equal to 1cm, we did see a significant difference only in the microsurgery group in the total PANQOL score. This is similar to the findings of Tufarelli et al, who suggested that surgery for incidental acoustic neuroma is associated with worse health-related quality of life management.11 Our study, however, did not specifically separate intracanalicular tumors from others.

Critical reviews of other AN QOL studies have questioned the validity of the symptom-specific scales involved and raised concern for a lack of attention to the psychosocial impact of the disease.12,13 Physician bias in quantifying AN-QOL has also been described, and there has been a push for self-administered and open-ended measures to help minimize this.14 Generic QOL instruments – frequently used in the AN literature – are also known to be less sensitive to change in clinical status and do not always provide clinically meaningful data.4 Numerous studies of health-related QOL in AN patients exist and make use of a variety of generic and symptom-specific scales, however a validated disease-specific QOL instrument for AN did not exist prior to the new Penn Acoustic Neurinoma Quality of Life (PANQOL) scale. The PANQOL scale is a reliable and valid disease-specific quality of life instrument for acoustic neuroma, and is the first such instrument to undergo a comprehensive validation study. Given the lack of a validated equivalent, this tool has the potential to become a critical outcome measure for studies examining the treatment of patients with acoustic neuroma. With this study we apply the PANQOL scale to a cohort of acoustic neuroma patients to compare quality of life in patients undergoing different treatment algorithms.

Materials & Methods

The study group consisted of all patients with a diagnosis of AN being actively followed in the outpatient clinics of the Hospital of the University of Pennsylvania’s Department of Otolaryngology—Head and Neck Surgery and those who presented during the study period. Inclusion criteria were an age of 18 or greater and a diagnosis of AN. Control patients were recruited from the head and neck surgery, rhinology, and general otolaryngology clinics at the Hospital of the University of Pennsylvania. Approval for the study was obtained from the Institutional Review Board at the Hospital of the University of Pennsylvania.

Study subjects were mailed an informed consent form, the PANQOL scale, and the SF-36 Health Survey. The PANQOL scale, shown in Figure 1, is a 26-item questionnaire that has been shown to be a reliable and valid measure of quality of life for acoustic neuroma.3 The SF-36 questionnaire is a reliable and valid measure of general health-related QOL used widely in the AN literature.6 A chart review was completed for study subjects and documented: patient age; gender; years since initial diagnosis of AN; years since any intervention of microsurgery or radiosurgery; facial nerve function as determined in the last clinic visit; and data from the most recent audiogram. Statistical analysis was performed using JMP (Cary, NC) version 8.8. Correlations were calculated using the Pearson product-moment correlation coefficient. Between-group mean comparisons were calculated using the Student’s t test for two groups and analysis of variances (ANOVA) for multiple groups. Pearson product-moment correlation coefficients greater than 0.21 are statistically significant with p < 0.05 (for N=143, null hypothesis p=0.05), however we considered only correlations above 0.40 to be clinically meaningful.