Correlating Singing Voice Handicap to Videostrobolaryngoscopy in Healthy Professional Singers

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Background

Assessing the vocal health of professional singers requires methods of evaluation that are sensitive to their needs. Professional singers place a unique demand on their vocal cords, forcing them to frequently withstand a high level of stress. These physical demands are more than the average person places on his voice through a moderate amount of daily speech, which therefore, may make singers more vulnerable to developing vocal problems1. Professional singers need to maintain good vocal health in order to consistently perform well and their ability to self-assess and recognize abnormal changes maximizes their performance capabilities. This study looks at the correlation between subjective and objective methods of evaluating the vocal health of professional singers. The Singing Voice Handicap Index (SVHI) is a questionnaire completed by the singer that was recently developed and validated as a tool to assess voice function and quality specifically in singers2. It was adapted from the previously existing Voice Handicap Index which is a questionnaire to assess vocal problems in the general population3,4. Videostrobolaryngoscopy is a similarly specialized tool performed by the medical provider that has proven valuable in accurately assessing vocal function and allows us to directly visualize the appearance of the vocal cords in a slow-motion video format. This makes it possible to clearly see the vibration cycle that is normally too fast for our eyes to process and examine the vocal cords in greater detail to more accurately assess vocal health. In this study, we prospectively compare the results from the SVHI questionnaire to the physical findings in the videostrobolaryngoscopy exams for a population of professional singers with no specific vocal complaints..

Objectives

- Analyze strength in correlation between SVHI and videostrobolaryngoscopy
- Measure the accuracy of the SVHI in predicting vocal health and identifying vocal problems in professional singers
- Develop a more comprehensive method of evaluating vocal health in singers
- Develop a method with increased sensitivity for detecting early vocal pathologies that may cause a problem in the future
- Define the accuracy of self-assessment among singers

Study Subjects

- 47 adult professional singers that met a series of 4 selection criteria

Singing Voice Handicap Index (SVHI)

- Vocal health self-assessment questionnaire: Series of 36 statements pertaining to singing voice quality and how it affects the singer’s life
- Singers rate each statement on a scale of 0 to 4 (0=never, 4=always) based on how strongly they agree, and a total SVHI score is generated

Demographics Questionnaire

- 26 questions about pertinent health history (acid reflux, allergies, smoking, drinking) and singing experience that may affect vocal health

Videostrobolaryngoscopy

- Flexible laryngoscope (Figure 1) inserted through the nares and larynx is visualized (Figure 2).
- Most accurate method of identifying anatomical and physiological abnormalities of the vocal cords
- Spoken and sung pitches used to assess vocal cord appearance and function

Videostrobolaryngoscopy Ratings

- 15 different parameters rated based on level of pathology on a scale of 0-3 (0=normal, 3=severely abnormal) for a Total Pathology Score (TPS)
- Parameters included but not limited to:
  - Redness and swelling of both arytenoids and vocal cords
  - Straightness of vocal fold medial edge
  - Vocal fold amplitude, mucosal wave, phase symmetry, and periodicity

Data Analysis

- The primary outcome (correlation between SVHI and TPS) was analyzed using two-tailed tests (alpha of 0.05), Pearson correlation, and two linear regression models (SAS 9.1); one unadjusted (p=0.4270) and another adjusted (p=0.5820) for demographics such as age, presence of reflux or allergies, years of singing experience and having been classically trained.
- Based on the bimodal distribution of the SVHI (Figure 4), a logistic regression (p = 0.0984) was then run using the SVHI and TPS adjusted for demographics.

Results

Figure 3. Plot of the SVHI and TPS. Regression analysis on the data points found no significant correlation.

Figure 4. Bimodal distribution of SVHI scores. Score of 40 used as the cutoff for logistic regression (above 40= pathology, below 40= no pathology).

Conclusions

- There is no significant correlation between the SVHI and videostrobolaryngoscopy findings in healthy professional singers
- The SVHI does not accurately predict vocal health as defined by strict pathological findings upon videostroboscopy examination
- It is difficult for even a professional singer, whom is supposedly more aware of their vocal health, to objectively assess the presence of pathology

Discussion

- Among singers who identified themselves as being healthy, we found more pathology than we expected. Perhaps these pathologies do not affect their singing or they have learned to work around them. What may be “normal” for one singer may be “abnormal” for another.
- Professional singers do not appear to have a strong ability to predict their vocal health as defined by total number of pathologic findings. This may be due to a difference in sensitivity in self-assessing vocal changes.
- Further research may explore the issue of vocal hygiene and it’s relation to perceived vocal health.
- A possible selection bias exists among the healthy appearing singers who volunteered for the study leading to higher than expected SVHI scores.

References


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