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SELF PERCEPTION OF VOICE CHANGES IN ELDERLY POPULATION: AN INDIAN PERSPECTIVE

Pathology

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ABSTRACT

The study aimed on investigating the self-perception of voice changes due to aging in elderly using Voice Related Quality of Life Measure (VRQOL) and Voice handicap index (VHI- 10) and to investigate the correlation between VRQOL and VHI- 10 scores. A total of 120 (60 females & 60 males) socially active individuals aged 60+ years were recruited for the study. All the participants self rated the voice change using VRQOL and VHI-10 questionnaires. Results revealed physical-functional domains to have greater impact when compared to social- emotional domains in both the groups. The voice change due to the aging mildly affected various domains of the subjective perception of voice. The two instrument used for self perception has shown significant positive correlation between the various domains assessed in elderly. VRQOL and VHI -10 has been observed to be useful measures to perceive the impact of voice changes and can be applied to elderly in India.

KEYWORDS

India, Voice, Elderly, Quality of life, Handicap Index, VRQOL, VHI-10

Introduction

In Indian societies, the proportion of people older than 60 years is the fastest growing subpopulation as a result of both increasing life expectancy and declining birth rates. Hence, increasing researches are carried out focusing on aging, age-associated diseases, and age-related influence on health. The ability to communicate our thoughts verbally be it feelings or opinions is a key component of any social relationships, and has been integral to complete participation in society at all ages. Communication relies on a healthy voice production system to express both complex ideas and emotions (Lortie, Thibeault, Guitton, & Tremblay, 2018). However, the human voice undergoes significant perceptual and acoustic transformations with age and these changes are caused by normal anatomical and physiological changes associated with this phase of life (Goy, Fernandes, Fuller, & Lieshout 2013). Old age may affect the voice, with changes in vocal pitch, loudness and quality being the most relevant (Mueller, 1997).

The degree to which a voice disorder impacts an individual's day-to-day activities may vary significantly depending on the severity of the voice change and the voice needs of the person. Some of these changes may negatively affect the communication process (Stathopoulos et al., 2011), and, in turn, the Quality of Life (QOL) of elderly.

As voice changes in seniors may be regarded as multidimensional, assessment and management also has to focus on various aspects (Hagen, Lyons & Nuss, 1996; Sataloff, Spiegel, & Rosen, 1997; Berg, Hapner, Klein, & Johns, 2008). Voice assessment comprises not only laryngeal morphology and voice function assessment, but also includes self-perception of voice changes. The self-perception of aging is mostly used to refer to a person's subjective age or his or her satisfaction with changes due to aging (Kleinspehn-Ammerlahn, Kotter-Grühn, & Smith, 2008). There are several self-assessment instruments designed to measure quality of life specific to dysphonia. These include the Voice Handicap Index (Jacobsen, et. al, 1997), the Voice Symptom Scale (Deary, Wilson, Carding, & MacKenzie, 2003), the Voice Handicap Index-10 (Rosen, Lee, Osborne, Zullo, & Murry, 2004) and the Voice-Related Quality of Life Measure (V-RQOL). At present, Voice Handicap Index (VHI) questionnaire is regarded as the gold standard (Boone, 1997; Sataloff, Rosen, Hawkshaw, & Spiegel, 1997; Ramig et al, 2001; Wendler, 2005) and the shorter Voice-Related Quality of Life (VRQOL) questionnaire are equivalent (Hogikyan & Sethuraman, 1999).

Understanding the degree to which the instruments are comparable will facilitate the usage of different instrument to measure voice outcomes. Study conducted by Portone, Hapner, McGregor, and Johns (2007) reported VHI and V-RQOL to be highly correlated. Another study comparing voice- and health-related quality of life in seniors reported presence of mild positive correlation (Plank, Schneider, Eysholdt, Schutzenberger, & Rosanowski, 2010). Unlike, in study by Schindler, et. al. (2010), the self-perception of voice and voice function do not correlate, both parameters have to be measured for voice assessment.

Presently, there is lack of clear consensus on the situations when voice changes classified as a disease, dysphonia in the elderly or age related changes, presbyphonia (Golub, Chen, Otto, Hapner & Johns, 2006; Hagen, Lyons, Nuss, 1996; Kandogan, Olgun, & Gultekin, 2003; Roy, Stemple, Merrill, Thomas, 2007; Woo, Casper, Colton, & Brewer, 1992; Berg, Hapner, Klein, Johns, 2008), or age changes without medical consequences (Sataloff, Rosen, Hawkshaw, Spiegel, 1997). Surprisingly, little is known about the adverse effects of voice changes on quality of life in the elderly especially in Indian context.

Hence, the study aimed on investigating the self-perception of voice changes in elderly. The secondary aim included exploring age and gender related voice changes due to aging in elderly using Voice Related Quality of Life Measure (VRQOL) and Voice handicap index (VHI- 10) and to investigate the correlation between VRQOL and VHI- 10.

Method

Participants

One hundred twenty socially active Kannada speaking individuals aged 60+ years were recruited for the study. Participants were divided into 60 females in group 1 and 60 males in group 2. All the participants were proficient to read and write English and data were collected from senior community centers, senior meetings in parks, and from home for aged. Persons reporting voice-related treatment or complaints, persons in need of skilled-nursing care and persons with relevant cognitive or neurological impairments were excluded from the study. All the participants signed the informed consent form agreeing to participate in the study and to the dissemination of results.

Procedure

The elderly participants recruited for the study were seated comfortably in a quiet, well lighted room and were asked to complete both VRQOL and VHI-10 questionnaires. Participants were instructed to read the questionnaire and rate it accordingly. Approximately 10-15 minutes was taken to fill in both the questionnaires. VRQOL included a total of 10 items (six of physical & four of socio-emotional domain). Every item was rated from 1 = "not a problem" to 5 = "a problem as bad as it can be." Other questionnaire, VHI-10 included ten questions (Rated from 0=Never to 4=Always) to be answered by the elderly assessing the physical, functional, and emotional domains.

Analysis

Responses obtained on both the questionnaire were analyzed and total - sub domain scores of VRQOL (social- emotional, physical-functional) and VHI-10 (Physical, functional, and emotional domains) were analyzed. The data obtained was subjected to statistical analysis, Test of significance for comparing across genders and Pearson correlation was used to find correlation between test tools.

Results and Discussion

The mean and standard deviation (SD) values of VRQOL and VHI-10 were analyzed for 120 participants. In present study, elderly with 60 + years reported voice changes and changes varied across gender. The mean total score on the VRQOL questionnaire was 89.34 and SD of 18.2 for females and 94.13, SD of 8.9 in men. Mean score on the VHI-

10 was 4.29 with SD 6.2 for females and 2.85 with SD of 4.2 for males (Table 1). The results obtained were not statistically significant (p = 0.06). Similar findings had been concluded in study conducted by Plank et al. (2010) and Schindler, et. al. (2010) were it was observed that, elderly above the age of 75 years exhibited greater impact of voice changes on their quality of life. The voice change due to the aging in the elderly probably could be due to fact that voice changes do not necessarily emerge suddenly and may not be noticed as easily as other physical changes.

Comparison across gender. Female group obtained lower VRQOL score when compared to males indicating that males have better QOL when compared to females. Results analyzing VHI-10 revealed that males obtained lower scores when compared to females indicating that the elderly female's perceived greater handicap due to voice changes than elderly males (Table 1). Unlike the present finding, in study conducted by Plank, et al., (2010), VRQOL values were observed to be lower in men (91.6) when compared to women (95.6).

Table. 1.
Mean and standard deviation (SD) for various domains of VRQOL and VHI- 10 questionnaires (FUN-functional, PHY-Physical, SOC-Social, and EMO- Emotional).

	VRQOL			VHI-10			
	FUN-PHY	SOC-EMO	TOTAL	PHY	FUN	EMO	TOTAL
FEMALE	^88.84 (12.0)	92.09 (13.9)	89.34 (18.2)	1.23 (0.1)	2.26 (1.4)	0.79 (0.2)	4.29 (2.2)
MALE	92.09 (10.8)	96.15 (7.8)	94.13 (8.9)	0.829 (0.3)	1.58 (1.2)	0.34 (0.2)	2.85 (1.1)

^Mean (SD)

Effect of voice changes on various domains. Voice changes are perceived by the elderly and the effect various across domains of functional, physical, social, and emotional. In VRQOL, functional and physical domain was observed to have greater effect than social and emotional domains. Similar finding were obtained using VHI-10, highest handicap obtained for functional when compared to physical domain and least effect perceived in emotional domain. Both male and female elderly reported similar effect across domain, but the handicap was perceived higher for females when compared to males.

Relationship between VRQOL and VHI-10
Linear regression analysis was used to examine the relationship between the V-RQOL (x) and VHI-10. (y). Regression analysis yielded the equation of

y- 14.37- 0.118 (x) for females
y=-8.651+ 0.931(x) for males.

Correlation between VRQOL and VHI-10
Results revealed a significant correlation obtained between VRQOL and VHI-10 for males and no such correlation obtained for females. There is thus arises a need to use both the test tools for studying voice changes among elderly females. Table 3 and 4 shows Pearson correlation and significance (p) values for various domains of VRQOL and VHI-10 for females and males respectively.

Table. 3.
Pearson Correlation and p values for various domains of VRQOL and VHI-10 for Females.

	SE-VRQOL	PF-VRQOL	T-VRQOL	P-VHI	F-VHI	E-VHI	T-VHI
SE-VRQOL		.605**	.850**	.064	.112	.135	.066
PF-VRQOL			.889**	-.052	-.114	-.202	-.118
T-VRQOL				.062	-.008	-.016	-.003
P-VHI					.641**	.595**	.788**
F-VHI						.825**	.947**
E-VHI							.884**

*Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).*

Table. 4.
Pearson Correlation and p values for various domains of VRQOL and VHI-10 for Males.

	SE-VRQOL	PF-VRQOL	T-VRQOL	P-VHI	F-VHI	E-VHI	T-VHI
SE-VRQOL		.628**	.593**	-.192	-.446**	-.210	-.383**
PF-VRQOL			.604**	-.438**	-.481**	-.535**	-.560**
T-VRQOL				-.199	-.309**	-.272*	-.316**
P-VHI					.604**	.727**	.855**
F-VHI						.538**	.899**
E-VHI							.800**

*Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed)*

In males, significant positive correlation with p value < 0.001 was obtained between social emotion (SE-VRQOL) and physical-functional (PF-VRQOL), SE-VRQOL and total (T-VRQOL), PF-VRQOL and T-VRQOL. Significant correlation obtained between physical VHI-10 (P-VHI) and function domain (F-VHI), emotional (E-VHI) and total (T-VHI). Significant negative correlation (p < 0.001) obtained between SE-VRQOL and F-VHI, T-VHI and SE-VRQOL, PF-VRQOL and P-VHI, F-VHI, E-VHI, T-VHI, T-VRQOL and F-VHI, E-VHI, T-VHI. These findings are supported by the study conducted by Portone, Hapner, McGregor, and Johns (2007).

Conclusions
To conclude, the voice change due to the aging mildly affects the various domains of the subjective perception of voice handicap. Results revealed physical-functional domains to have greater impact when compared to social- emotional domains in both the groups. The two instrument used for self perception has shown significant correlation between the various domains assessed in elderly male and are useful measures to perceive the impact of voice changes due to aging on the quality of life in the elderly.

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