

Risk Factors And Quality Of Life Of Adult Patients With Chronic Voice Disorders

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Abstract

The aim of the present research is to determine the common causes of chronic voice disorders, to determine the sociodemographic and behavioral risk factors for patients with chronic voice disorders and to study the QOL of them. The ORL Outpatient Clinics, Al-Azhar University hospitals were chosen to carry out this study. A total of 495 patients with chronic voice disorders and a control group of the same number were enrolled in the study. A case-control, hospital based study design was used. The most common causes of chronic voice disorders among these patients were chronic laryngitis (35.6%), vocal fold nodules (22.6%), functional dysphonia (18.6%) and vocal fold polyps (13.5%). The 25-44 years age group, low social class, sale man occupation, urban residence and female gender were the most important significant sociodemographic risk factors for patients with chronic voice disorders (ORs= 4.17, 2.01, 1.71, 1.60 and 1.32, respectively). The +ve reflux symptoms index, voice abuse and smoking were an important significant clinical risk factors (ORs=16.94, 8.33 and 6.01, respectively). Also, patients with chronic voice disorders had a significantly poorer self-reported health related domain scores than the controls on all eight SF-36 domains (P=0.00). Moreover, patients with chronic voice disorders due to different laryngeal diseases had a significantly poorer self-reported health related domain scores than the controls on all eight SF-36 domains except in the miscellaneous diseases group.

Introduction

Voice is one of the unique attributes of humans. It provides a principal means of communication, emotional expression and identity (Solomon *et al.*, 2003). Voice disorders exist when quality, pitch or loudness differs from others of the same age, gender, cultural background and geographic location, thereby drawing attention to the speaker. Voice disorders may results from changes in the structure and/or function of the laryngeal mechanism (Stemple *et al.*, 1996). Laryngeal pathologies that cause voice disorders comprise a group of diseases; the most frequent are chronic laryngitis, nodules, polyps, edema, functional dysphonia ...etc (Herrington-Hall *et al.*, 1988 and Coyle *et al.*, 2001). Epidemiological reports on the occurrence of chronic voice disorders have been few in number. Also, reports are

relatively scarce, outdated and provide conflicting information (Miller and Verdolini, 1995; Smith *et al.*, 1997 and Titze *et al.*, 2007). An update of such data may lead to further identification of subjects at risk for developing chronic voice disorders, information to enhance public education about voice disorders and identifying of risk factors associated with various demographic and clinical variables (Coyle *et al.*, 2001 and Titze *et al.*, 2007).

Moreover, over the past 20 years there has been an increased recognition of the patient's point of view as an important component in the assessment of health care outcomes (Watson *et al.*, 1996). Quality of life (QOL) has become accepted as an end point in clinical research trials, as interest in patients' experiences and preferences has grown (Patrick and Bergner, 1990). Reports

of QOL end points remain uncommon and quality of reporting is often poor (Sanders *et al.*, 1998). Also, the term QOL is often used vaguely and without clear definition (Fallowfield, 1996). The most accepted definition of QOL is "a measure of the optimum energy or force that endows a person with the power to cope successfully with the full range of challenges encountered in the real world". The term QOL applies to all individuals, regardless of illness or handicap, on the job, at home or in leisure activities (Gotay *et al.*, 1992). The perception of QOL varies between individuals and it is dynamic within them. QOL in relation to health is the gap between our expectations and experience of health. People with different expectations report a different QOL even when the same clinical condition is present. Current measures for QOL do not account for expectations of health (Guillemin *et al.*, 1993 and Carr *et al.*, 2006). There are many instruments that have been proposed to measure QOL; generic measures as the sickness impact profile (Bergner *et al.*, 1981). Other methods include measures focusing on a single aspect such as pain or anxiety and individualized measures, in which patients define and rate the most important aspects of their QOL (Begg *et al.*, 1996).

People with dysphonia seem to experience employment, lifestyle and social difficulties as a direct consequence of their voice disorders. Assessments of the impact of dysphonia on the patient have focused on psychological and voice outcomes. Any attempts to quantify the effects of the disorder on general health and quality of life have relied upon open-ended patient reports (Scott *et al.*, 1997). There have been few studies of the QOL of patients with dysphonia (Benninger *et al.*, 1998 and Spector *et al.*, 2001).

The aim of the present research is to determine the most common causes of voice disorders, to define the sociodemographic, behavioral and clinical risk factors for patients with chronic voice disorders and to study the QOL of these patients with chronic voice disorders due to laryngeal diseases.

Subjects And Methods

This study was carried out in the Oto-Rhino-Laryngology (ORL) Out-patient Clinics, Al-Azhar University Hospitals in Cairo and Assiut. A total number of 495 patients with chronic voice disorders due to laryngeal diseases and an equal number of adult controls were enrolled in this study. The control group was chosen randomly from adults attending the clinics for reasons other than chronic voice disorders and found to be free. A case-control, hospital based study design was chosen to carry out this study. Chronic was defined as a period ≥ 4 weeks. The chronic voice disorder patients and controls were adults, their age was ≥ 18 years. The purpose of the study was explained to the patients and controls. A verbal consent of both of them, to participate in the study, was given.

Clinical examinations had been done for the patient and control groups. Also, the required investigations had been done for the patients. Laryngeal diseases that caused chronic voice disorders were diagnosed through specific protocol according to El-Moselhy *et al.* (2004). Also, a comprehensive questionnaire was designed to contain data relevant to the topic of the study.

The reflux symptoms index (RSI) was used to determine presence of reflux symptoms. Normative data suggests that a RSI of ≥ 10 is clinically significant. Subjects were classified as having +ve RSI, if scored ≥ 10 and -ve RSI, if scored < 10 . Presence of +ve or -ve RSI was related to presence or absence of laryngeal pathologies (Belafsky *et al.*, 2002).

We used the medical outcomes study 36-item short form (SF-36) to study the QOL of the patients with chronic voice disorders due to laryngeal diseases. SF-36 is one of the most widely accepted, used and psychometrically sound instrument designed to measure general health items (Watson *et al.*, 1996). The reliability and validity of the SF-36 have been documented. Also, health functioning changed in the hypothesized direction with increased age, socioeconomic status and disease status in a population-based study suggested that the instrument is sensitive to

changes in the health of the general population (Garratt, 2002). It allows investigators to explore the interaction and relative effect of multiple health conditions in the same patient. The SF-36 is containing 36 questions; each patient is scored from 0 (worst) to 100 (best) on 8 separate domains of health-related QOL. These domains include physical functioning (PF), physical limitation (PL), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role functioning-emotional (RE) and mental health (MH). The questionnaire is scored according to published algorithms and it takes about 10 minutes to be complete (Hemingway *et al.*, 1997). These scales are ordered according to the degree to which they measure physical versus mental health. The 36-item question is distributed over the 8-health domains. The SF-36 quantifies a broad range of health issues and is thus acceptable for an exploratory study on QOL in conditions that may be anticipated to affect patients in a variety of ways (Ware *et al.*, 1993). Normative data are the key to determining whether a group or an individual scores below or above the average for their country, age or sex (Fitzpatrick *et al.*, 2001). The chronic form of the SF-36 was used to study the impact of chronic voice disorders due to laryngeal diseases on QOL. Impact of chronic voice disorder was compared with control group, and then different etiological pathologies were compared separately with the control group.

Chi-square (χ^2), t-test and odds ratio (OR) were used as tests of significance. The significance level for χ^2 and t was accepted if P-value ≤ 0.05 while, OR was weighted according to value of the 95% confidence interval (CI) or exact confidence limits (ECL).

Results

Table (1) shows the frequency distribution of chronic voice disorder patients according to the etiology. It is clear that chronic laryngitis was the most common cause (35.6%) of chronic voice disorders. Vocal fold nodules (22.6%), functional dysphonia (18.6%), vocal fold polyps (13.5%) and a group of

miscellaneous conditions (9.7%) were the other etiological causes of chronic voice disorders.

Table (2) details the distribution of chronic voice disorder patients and control group according to their sociodemographic risk factors. As regard sex, female sex was found to be a significant risk factor for a subject to be a patient with chronic voice disorders; females were 56.2% (OR=1.32, 95% CI: 1.02-1.71). Also, 25-44 year age group was found to be a significant risk factor for a subject to be a patient with chronic voice disorders; the patients in this group were 44.8% (OR=1.33, 95% CI: 1.02-1.73). At the same time, some occupations were found to be significant risk factors for chronic voice disorders. The ORs for house wife's, factory workers, teachers, sale men and retirees were 1.38, 95% CI: 1.01-1.89; 1.46, 95% CI: 1.01-2.09; 1.51, 95% CI: 1.01-2.27; 1.71, 95% CI: 1.02-2.86 and 1.69, 95% CI: 1.08-2.65; respectively. Moreover, low social class was a significant risk factor for chronic voice disorders (OR=2.01, 95% CI: 1.54-2.62). Lastly, urban residence was a significant risk factor for chronic voice disorders (OR=1.60, 95% CI: 1.04-2.47).

Table (3) sssshows the distribution of chronic voice disorder patients and control group according to behavioral risk factors. As regard voice abuse, it was found to be a significant risk factor for a subject to be a patient with chronic voice disorders (OR=8.33, 95% CI: 5.97-11.64). Moreover, smoking was a significant risk factor for chronic voice disorders (OR=6.01, 95% CI: 2.29-3.95). Also, alcohol intake was a significant risk factor for a subject to be a patient with chronic voice disorders (OR=2.90, 95% ECL: 1.08-9.05).

Table (4) clears the distribution of chronic voice disorder patients and control group according to reflux symptom index risk factor. RSI was found to be a significant risk factor for a subject to be a patient with chronic voice disorders (OR=16.94, 95% CI: 11.80-24.38).

Table (5) demonstrates the distribution of chronic voice disorder patients according to their sociodemo-graphic risk factors. As respect sex, females were found to be significantly more common among all groups of the patients with chronic voice

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disorders except the miscellaneous diseases group. Females were 55.1%, 57.1%, 65.2%, 52.2% and 45.8% in the chronic laryngitis, vocal fold nodules, functional dysphonia, vocal fold polyps and miscellaneous diseases groups; respectively. Also, 25-44 year age group was found to be the most common age to represent all patients with chronic voice disorders; the chronic laryngitis (38.6%), vocal fold nodules (68.8%), functional dysphonia (42.4%) and vocal fold polyps (43.3%). While, the patients in miscellaneous diseases group were more present in the 45-64 year age group, 54.2%. Moreover, the house wife and factory worker were the most common occupations found among patients with chronic voice disorders. The house wife's were more common in groups of vocal fold nodules (29.5%), functional dysphonia (32.6%) and vocal fold polyps (31.3%). While, factory workers were more common in groups of chronic laryngitis (26.7%) and vocal fold polyps (31.3%). Also, the patients of miscellaneous diseases group were more common in the retired group (70.8%). As regard social class, low social class was found to be non-significantly more common among all groups of the patients with chronic voice disorders except the miscellaneous diseases group. Lastly, all groups of patients with chronic voice disorders had urban residence with a statistically significant difference; the vocal fold nodules (97.3%), functional dysphonia (94.6%), vocal fold polyps (91.1%), chronic

laryngitis (88.6%) and miscellaneous diseases group (83.3%).

Table (6) illustrates the mean and standard deviation of chronic voice disorder patients and control group according to SF-36 QOL domain scores. All the means and standard deviations of the eight domain scores of the SF-36 QOL of chronic voice disorder patients were less than that of the controls with statistically significant differences ($P=0.000$).

Table (7) shows the means and standard deviations of different groups of chronic voice disorder patients and control group according to the SF-36 QOL domain scores. As respect chronic laryngitis, vocal fold nodules, functional dysphonia and vocal fold polyps; the means and standard deviations of the eight domain scores of SF-36 QOL were less than that of the controls with statistically significant differences. As regard the miscellaneous diseases group, the means and standard deviations of the eight domain scores of the SF-36 QOL were less than that of the controls with statistically significant differences except that of bodily pain ($P=0.09$). Patients with functional dysphonia scored the lowest scores in all of the eight domains of the SF-36 QOL except physical functioning. On the other hand, patients with vocal fold nodules scored the highest scores in all of the eight domains of the SF-36 QOL except social functioning. But, patients with chronic laryngitis scored the lowest score in physical functioning domain of the SF-36 QOL.

Table (1): Frequency distribution of chronic voice disorder patients according to the etiology.

Etiology	Chronic voice disorder patients (n=495)	
	NO.	Percent
Chronic laryngitis	176	35.6
Vocal fold nodule	112	22.6
Functional dysphonia	92	18.6
Vocal fold polyp	67	13.5
Miscellaneous:	48	9.7
Larynoscleroma	13	2.6
Vocal fold paralysis	12	2.4
Bowed vocal fold	10	2.0
Reinke's edema	9	1.8
Neurogenic dysphonia	4	0.8

Table (2): Distribution of chronic voice disorder patients and control group according to sociodemographic risk factors.

Variable	Chronic voice disorder (n=495)		Control group (n=495)		OR (95% CI)
	NO.	%	NO.	%	
Sex:					
Female	278	56.2	244	49.3	1.32 (1.02-1.71)
Male	217	43.8	251	50.7	0.76 (0.59-0.98)
Age (years):					
18-24	89	18.0	108	21.8	0.79 (0.57-1.09)
25-44	205	41.4	172	34.8	1.33 (1.02-1.73)
45-64	174	35.1	167	33.7	1.06 (0.81-1.40)
≥65	27	5.5	48	9.7	0.54 (0.32-0.90)
Occupation:					
House wife	122	24.6	95	19.2	1.38 (1.01-1.89)
Retired	61	12.3	38	7.7	1.69 (1.08-2.65)
Factory worker	98	19.8	59	11.9	1.46 (1.01-2.09)
Sale man	46	9.3	28	5.7	1.71 (1.02-2.86)
Teacher	72	14.6	50	10.1	1.51 (1.01-2.27)
Unemployed	29	5.9	71	14.3	0.37 (0.23-0.60)
Driver	24	4.8	17	3.4	1.43 (0.73-2.83)
Other	43	8.7	137	27.7	0.25 (0.33-0.56)
Social class:					
Low	247	49.9	164	33.1	2.01 (1.54-2.62)
Middle	198	40.0	249	50.3	0.66 (0.51-0.85)
High	50	10.1	82	16.6	0.57 (0.38-0.84)
Residence:					
Urban	453	91.5	431	87.1	1.60 (1.04-2.47)
Rural	42	8.5	64	12.9	0.62 (0.41-0.96)

Table (3): Distribution of chronic voice disorder patients and control group according to behavioral risk factors.

Variable	Chronic voice disorder (n=495)		Control group (n=495)		OR (95% CI) OR (95% ECL)*
	NO.	%	NO.	%	
Voice abuse:					
Yes	267	53.9	61	12.3	8.33 (5.97-11.64)
Smoking:					
Yes	271	54.8	142	28.7	6.01 (2.29-3.95)
Alcohol intake:					
Yes	17	3.4	9	1.8	2.90 (1.08-9.05)*

Table (4): Distribution of chronic voice disorder patients and control group according reflux symptoms index (RSI) risk factor.

Reflux symptoms index	Chronic voice disorder (n=495)		Control group (n=495)		OR (95% CI)
	NO.	%	NO.	%	
+ve RSI	322	65.1	49	9.9	16.94 (11.80-24.38)
-ve RSI	173	34.9	446	90.1	

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Table (5): Distribution of chronic voice disorder patients due to different chronic laryngeal diseases according to their sociodemographic risk factors.

Variable	Chronic laryngitis (n=176)		Vocal fold nodule (n=112)		Functional dysphonia (n=92)		Vocal fold Polyp (n=67)		Miscellaneous conditions (n=48)		χ^2	P-value
	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%		
Sex:												
Male	79	44.9	48	42.9	32	34.8	32	47.8	26	54.2	12.95	0.011
Female	97	55.1	64	57.1	60	65.2	35	52.2	22	45.8		
Age (years):												
18-24	36	20.5	25	22.3	16	17.4	11	16.4	0	0.0	12.92	0.0160.
25-44	68	38.6	77	68.8	39	42.4	29	43.3	5	11.4	51.974	000
45-64	64	36.4	9	8.0	34	37.0	23	34.3	26	54.2	3.4472.	0.0000.
≥65	8	4.5	1	0.9	3	3.2	4	6.0	17	35.4	80	000
Occupation:												
House wife	34	19.3	33	29.5	30	32.6	21	31.3	4	8.3	15.73	0.003
Retired	6	3.4	9	8.0	7	7.6	5	7.5	34	70.8	170.3	0.0000.
Factory worker	47	26.7	19	17.0	9	9.8	21	31.3	2	4.2	24.681	000
Sale man	26	14.8	8	7.1	8	8.7	3	4.5	1	2.1	1.73	0.0190.
Teacher	22	12.5	23	20.5	22	23.9	5	7.5	0	0.0	21.20	000
Unemployed	13	7.4	6	5.4	6	6.5	3	4.5	1	2.1	2.34	0.673
Driver	12	6.8	5	4.5	4	4.4	3	4.5	0	0.0	4.03	0.401
Other	16	9.1	9	8.0	6	6.5	6	8.9	6	12.5	1.53	0.822
Social class:												
Low	81	46.0	62	55.4	46	50.0	37	55.2	21	43.8	3.88	0.422
Middle	73	41.5	38	33.9	39	42.4	24	35.8	24	50.0	4.59	0.332
High	22	12.5	12	10.7	7	7.6	6	9.0	3	6.2	1.67	0.614
Residence:												
Urban	156	88.6	109	97.3	87	94.6	61	91.1	40	83.3	12.00	0.017
Rural	20	11.4	3	2.7	5	5.4	6	8.9	8	16.7		

Table (6): Mean and standard deviation of the chronic voice disorder patients and control group according to short form-36 QOL domain score.

SF-36 domain score	Patients mean ± SD	Controls mean ± SD	t	P-value
Physical functioning	64.48 ± 15.48	83.91 ± 12.47	21.747	0.000
Physical limitation	57.38 ± 13.75	84.76 ± 12.51	32.770	0.000
Bodily Pain	63.77 ± 15.28	77.79 ± 13.75	15.175	0.000
General health	59.80 ± 14.88	74.98 ± 15.79	15.566	0.000
Vitality	53.71 ± 12.37	70.81 ± 15.56	19.139	0.000
Social functioning	72.73 ± 14.76	87.53 ± 11.38	17.667	0.000
Emotional limitation	65.05 ± 16.38	85.80 ± 13.87	21.509	0.000
Mental health	65.44 ± 14.80	76.43 ± 16.46	11.033	0.000

Table (7): Mean and standard deviation of different causes of chronic voice disorder patients and control group according to short form-36 QOL domain score.

SF-36 domain score	Ch Laryng. Mean ± SD P-value	VFN Mean ± SD P-value	FD Mean ± SD P-value	VFP Mean ± SD P-value	Miscellan. Mean ± SD P-value	Controls Mean ± SD
Physical functioning	60.54±15.37 P= 0.000	72.11±14.34 P= 0.000	61.92±13.87 P= 0.000	66.57±13.19 P= 0.000	64.17±16.32 P= 0.000	83.91±12.47
Physical limitation	53.31±10.52 P= 0.000	65.82±16.68 P= 0.000	51.57±8.75 P= 0.000	62.47±11.98 P= 0.000	55.75±9.78 P= 0.000	84.76±12.51
Bodily Pain	61.03±14.58 P= 0.000	69.17±13.25 P= 0.000	57.36±12.91 P= 0.000	67.75±14.69 P= 0.000	73.97±14.82 P= 0.092	77.79±13.75
General health	56.91±14.19 P= 0.000	64.81±15.56 P= 0.000	54.97±12.18 P= 0.000	65.41±14.18 P= 0.000	58.95±11.43 P= 0.000	74.98±15.79
Vitality	52.82±13.38 P= 0.000	53.74±12.81 P= 0.000	51.39±8.24 P= 0.000	53.25±9.78 P= 0.000	52.84 ±9.94 P= 0.000	70.81±15.56
Social functioning	73.37±14.35 P= 0.000	74.03±14.88 P= 0.000	65.96±12.52 P= 0.000	74.85±10.66 P= 0.000	68.72±11.32 P= 0.000	87.53±11.38
Emotional limitation	62.71±17.54 P= 0.000	71.91±13.82 P= 0.000	59.13±13.81 P= 0.000	70.05±12.29 P= 0.000	62.43±12.69 P= 0.000	85.80±13.87
Mental health	61.73±14.46 P= 0.000	71.71±12.90 P= 0.001	60.32±12.68 P= 0.000	69.72±12.16 P= 0.000	62.95±12.97 P= 0.000	76.43±16.46

Discussion

Voice is a unique attributes of humans; provides a principal means of communication, emotional expression and identity (Solomon *et al.*, 2003). Also, the field of laryngology is dynamic and ever changing; at the crossroads is the larynx, a barometer of our physical and mental health (Aronson, 1980).

Spiegel *et al.* (2000) stated that laryngitis is the most common laryngeal diseases. While, Herrington-Hall *et al.* (1988) and Coyle *et al.* (2001) cleared that the most common diseases that cause dysphonia were vocal fold nodules, functional dysphonia, vocal fold polyps and vocal fold paralysis. This may be explained partially by the geographical and socio-cultural differences between the two societies. The most obvious difference between our results and similar studies of Herrington-Hall *et al.* (1988) and Coyle *et al.* (2001) is the presence 2.6% of cases having laryngoscleroma, which it is documented to be endemic in Egypt (Abou-Seif *et al.*, 1991 and Thompson, 2002).

The female gender (table 2) was found to be a risk factor for patients with

chronic voice disorders (OR=1.32, 95% CI: 1.02-1.71). Cooper (1973) and Herrington-Hall *et al.* (1988) agreed with our result while, Fitz-Hugh *et al.* (1958) disagreed. This may be explained by the changes in the socio-cultural aspects of females across time. At the same time, Herrington-Hall *et al.* (1988) reported that laryngeal pathologies occurred primarily in the old age groups, 57% of their cases were over 45 years old and 22.4% over age 64. Also, Coyle *et al.* (2001) showed that laryngeal pathologies occurred most frequent (38.9%) in 45-64 years age group, patients in the age groups 25-44 years and >64 years were 26.4% and 26.8% of subjects, respectively. So, our results disagree with these studies regarding age. In our study, there is tendency for patients with chronic voice disorders due to laryngeal diseases to occur in the middle age group (25-44 years) compared to the oldest age category commonly affected in Herrington-Hall *et al.* (1988) and Coyle *et al.* (2001) studies. This disagreement may have attributed to the high life expectancy in Americans, public awareness and better health education about

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the association of chronic voice problems in western countries may have influences more adults to find out the cause of dysphonia. However, Herrington-Hall *et al.* (1988) reported that the peak years for abuse lesions in females were 20-50. Also, Holinger and Johnston (1951) stated that of significance too was the number of women with small children that they felt required constant disciplining. Likewise, Cooper (1973) found that the most common occupation was that of homemaker. Also, Herrington-Hall *et al.* (1988) stated that it seems logic to agree that some occupations carry opportunities for voice abuse, as well as emotional conflicts that were presumed to underlie psychogenic disorder. They added that the peak period for abuse lesions in females was coinciding with the child-rearing years. Also, they suggested that working conditions that require speaking over noise and breathing irritants in the air, as well as physical exertion are possible causes of voice disorders in this population. In addition, Cleary (1982) and Hibbard & Pop (1986) cleared that women's number was increased in the labor force and consequently more exposure to occupational hazards, increase numbers of cigarette smoking among them, in addition to their responsibilities as primary caretakers of home and family. Also, women appear to be more interested in health, more likely to recognize bodily changes as symptoms of an illness and more apt to seek medical care than men. Again, this is in agreeing with our results that some occupations found to be a significant risk factor for a subject to be a patient with chronic voice disorders as house wife's, factory workers, teachers and sale men. Moreover, low social class represented a risk factor for chronic voice disorders. Elwood *et al.* (1984); Hirayama (1990) and Menvielle *et al.* (2004) agreed that low social class found to be a significant risk factor for a subject to be a patient with chronic voice disorder. Lastly, urban residence found to be a significant risk factor for chronic voice disorders. This finding is expected and accepted in light what was previously mentioned and the relatively small number of patients from rural areas.

Regarding voice abuse (table 3), it was an important risk factor for chronic

voice disorders (OR=8.33, 95% CI: 5.97-11.64). This result was consistent with Holinger and Johnston (1951); Cooper (1973); Kambic *et al.* (1981); Herrington-Hall *et al.* (1988); Garcia *et al.* (1999) and Thibeault *et al.* (2002). Holinger and Johnston (1951) cleared that the number of women with small children, which they felt required constant disciplining was significantly high. Likewise, Cooper (1973) cleared that the homemakers were the most common group with voice disorders. Also, Herrington-Hall *et al.* (1988) supposed that voice abuse and the emotional conflicts that were underlie psychogenic disorders lead to a subject with voice disorders. Garcia *et al.* (1999) showed that voice abuse or misuse was the main risk factor in patients with chronic voice disorders. Thibeault *et al.* (2002) cleared that vocal overuse (excessive quantity of voice), abuse (yelling) and misuse (vocal hyperfunction with excessive muscular tension) presumably a risk factor for voice disorders. As respect smoking, it was a risk factor for voice disorders (OR=6.01, 95% CI: 2.29-3.95). Cigarette smoke is chronically irritating to the laryngeal mucosa and at the extreme it can provoke cancer (Hanson and Jiang, 2000). Further, Kambic *et al.* (1981) showed that about 50.0% of the patients with chronic voice disorders were smokers. Also, Garcia *et al.* (1999) found that smoking was the main risk factor for vocal folds polyps and edema, which will lead to dysphonia. Also, alcohol intake represented a risk factor for voice disorders (OR=2.90, 95% ECL: 1.08-9.05). This result was consistent with Rothman *et al.* (1980); Guenel *et al.* (1988) and Altieri *et al.* (2002).

As respect results of RSI (table 4), +ve RSI was a risk factor for chronic voice disorders (OR=16.94, 95% CI: 11.80-24.38). Koufman *et al.* (1994); El-Serag *et al.* (2001) and Galli *et al.* (2002) agreed our result. Koufman *et al.* (1994) found that 50.0% of their population, new patients with chronic voice disorders due to laryngeal diseases, had documented reflux disease. Reflux was also present very frequently in patients with functional dysphonia. On the other hand, reflux was infrequently found in patients with vocal fold paralysis.

The females were more commonly present in most groups of voice disorder

patients; chronic laryngitis, vocal fold nodules, functional dysphonia and vocal fold polyps (table 5). While, the males were more commonly present in the miscellaneous diseases group of voice disorder patients. Previous studies of benign laryngeal lesions demonstrated a shift over the time as regard gender. Studies done before 1960 (Holinger & Johnston, 1951 and Fitz-Hugh *et al.*, 1958) showed about 69.0% of lesions occurred in males and 31.0% in females. Cooper (1973) reported 46.0% males and 54.0% females, which suggested a dramatic shift in the male/female percents. Also, Herrington-Hall *et al.* (1988) found similar results when comparing benign lesions due to abuse of the voice, a significant change from 25.0% of voice disorders found in women in 1938 to 63.0% in their study. Several reasons for this increase in occurrence in women were hypothesized as increased number of women in the labor force and consequently more exposure to occupational hazards, increase numbers of cigarette smoking among them, in addition to their responsibilities as primary caretakers of the home and family. Also, some studies have shown that women appear to be more interested in health, more likely to recognize bodily changes as symptoms of an illness and more apt to seek medical care than men (Cleary, 1982 and Hibbard & Pop, 1986). Also, functional voice disorders occurred predominantly in women (Fried, 1996). As regard age, Hanson and Jiang (2002) cleared that adults in the sixth decade of life were mainly affected with chronic laryngitis. Also, Herrington-Hall *et al.* (1988) detailed that chronic laryngitis occurred more commonly in the 25-44 and 45-64 year age groups, functional dysphonia in the 45-64 and 25-44 year age groups and neurogenic dysphonia in the oldest age group. Coyle *et al.* (2001) showed that chronic laryngitis affected more commonly the 45-64 and 25-44 year age groups and functional dysphonia in the 45-64 and ≥ 65 year age groups. The patients in miscellaneous diseases group (table 5) were significantly more in the 45-46 year age group. Coyle *et al.* (2001) observed that vocal fold paralysis was more commonly affected the 25-44 and 45-64 year age groups, bowed vocal fold

commonly affected the ≥ 65 year age group. The 25-44 year age group was the commonest age group significantly affected with vocal fold nodules in the present study. This is consistent with Coyle *et al.* (2001) findings. However, Herrington-Hall *et al.* (1988) cleared that vocal fold nodules commonly affected the 18-24 year age group. Also, vocal fold polyps were found in the present study to occur more in the 25-44 year age group. Kambic *et al.* (1981); Herrington-Hall *et al.* (1988) and Coyle *et al.* (2001) disagreed our result, they reported that vocal fold polyps were found to occur more in the 45-64 year age group. As respect social class, low social class was more present among the chronic laryngitis, vocal fold nodules, functional dysphonia and vocal fold polyps that caused chronic voice disorders. Elwood *et al.* (1984); Hirayama (1990) and Menvielle *et al.* (2004) agreed that low social class found to be more common among patients with chronic voice disorders. Lastly, all groups of patients with chronic voice disorders had urban residence with a statistically significant difference. Again, this finding is expected and accepted in light of what was previously mentioned and the relatively small number of patients from rural areas.

Health-related QOL represents the functional effects of an illness upon a patient as perceived by the patient. "Quality of life reflects a measure of the difference or gap between one's perceived reality and one's expectations or wishes" (Guillemin *et al.*, 1993). Quality of life of well-being is a composite of two components; first, the ability to perform everyday activities that reflect physical, psychological and second, social well-being and patient satisfaction with levels of functioning and the control of disease and/or treatment-related symptoms (Gotay *et al.*, 1992). The term QOL is usually used vaguely, without obvious definition (Fallowfield, 1996). This is not surprising, considering the broad nature of a concept that includes physical functioning (ability to carry out activities of daily living e.g. self care), social functioning (relationships with others and participation in social activities), psychological functioning (emotional and mental well-being) and perception of health status; pain and the overall satisfaction with life (Naughton and

Shumaker, 1996). QOL is also a subjective concept, multidimensional scope that requires information about a range of areas of patient's life such as physical wellbeing, functional abilities, emotional and social wellbeing (De Antonio *et al.*, 2001). In addition, it is dynamic, because it often changes across time and situations (Aronson, 1980 and Guillemin *et al.*, 1993). Also, QOL measures subjective experiences, patient and professional can have different perspectives on what constitutes QOL. These different perspectives make it difficult to assess QOL (Gotay *et al.*, 1992). The SF-36 broadly assesses physical, mental and social health and can be used to compare conditions and therapies (Guyatt *et al.*, 1986 and Ware & Sherbourne, 1992). Further, the SF-36 sensitivity to the presence of otolaryngological conditions was confirmed. Otolaryngologists are likely to use health status increasingly as health care purchasers look for greater accountability in expenditure. The SF-36 is a comprehensively validated instrument and continues to be the subject of an extensive program of ongoing research. It is easy to use, but surgeons must be able to appreciate the nuances of their findings (Benninger *et al.*, 1998).

In this study the SF-36 questionnaire was used to assess the QOL of patients with chronic voice disorders due to laryngeal diseases and to examine the differential impact of chronic voice disorders on the various health status domains. The results of the present study confirmed that patients with chronic voice disorders due to laryngeal diseases had significantly poorer self-reported health than the controls on all the eight SF-36 subscales ($P=0.000$) (Table 6). These results, confirm the sensitivity of the SF-36 to the presence of oto-laryngological conditions, agreeing with the results of many studies. Smith *et al.* (1996) demonstrated considerable impact of dysphonia on patients' health status. Scott *et al.* (1997) illustrated that people with dysphonia experience social, lifestyle and employment difficulties as a direct consequence of their voice disorders. Also, Benninger *et al.* (1998) used the SF-36 to assess QOL in a heterogeneous group of dysphonic patients; they found significant reductions in a number of domains. Wilson

et al. (2002) compared self-rated general health status as measured by the SF-36 in a large cohort of dysphonic patients with those of control group to examine the differential impact of dysphonia on the various health status domains. They concluded that dysphonic patients without obvious laryngeal disease have an adverse impact on all health status subscales as measured by the SF-36.

When comparing the SF-36 domains of the different laryngeal diseases separately that caused chronic voice disorders with control group; all domains were significantly lower in patients with chronic laryngitis, vocal fold nodules, functional dysphonia, vocal fold polyps and miscellaneous diseases group; all scored significantly lower in all domains of the SF-36 than control group except bodily pain in the miscellaneous diseases group (Table 7). Benninger *et al.* (1998) evaluated QOL of the 3 major etiologies of dysphonia; masses, edema and vocal fold paralysis; vocal fold paralysis consistently demonstrated the worst scores of the eight SF-36 domains. Also, Spector *et al.* (2001) in a prospective observational outcome study of consecutive patients presenting to a laryngology clinic with unilateral vocal fold paralysis to identify the disease impact on an individual's QOL using the SF-36. They cleared that patients revealed statistically significant reductions in QOL. Carrau *et al.* (2004) compared patient-reported outcomes health-related QOL of the patients with laryngopharyngeal reflux with general population by the SF-36. They showed that it has a significant negative impact on the lives of patients.

Conclusions And Recommendations

It could be concluded that the most common causes of chronic voice disorders were chronic laryngitis, vocal fold nodules, functional dysphonia and vocal fold polyps. The 25-44 year age group, low social class, some jobs, urban residence and female gender were the most important sociodemographic risk factors of chronic voice disorders. Also, +ve RSI, voice abuse and smoking were important clinical risk factors. At the same time, the results of the study confirmed that patients with chronic

voice disorders had significantly poorer self-reported health than the controls on all the eight SF-36 domains. These results emphasize the need to include a generic QOL outcome measure in the assessment of the patients with chronic voice disorders. So, it is recommended to focus research efforts, health education and clinical practices on the chronic voice disorders. More work should be conducted in more areas. Also, population based studies are needed to determine the epidemiology and QOL of the patients with chronic voice disorders in Egypt.

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عوامل الخطورة و نوعية الحياة فى المرضى البالغين المصابين بمشاكل الصوت المزمنة

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إن الهدف من هذا البحث هو تحديد الأسباب الشائعة لمشاكل الصوت المزمنة وتحديد عوامل الخطورة الاجتماعية-الديموجرافية والسلوكية ودراسة نوعية الحياة لمرضى مشاكل الصوت المزمنة. وقد أجريت هذه الدراسة على 495 مريضاً ممن يعانون من مشاكل الصوت المزمنة وكذلك عدد مساوي من الأشخاص السالمين كمجموعة ضابطة من المترددين على عيادة الأنف والأذن والحنجرة بمستشفيات جامعة الأزهر. وقد أستخدم نمط دراسة الحالة الضابطة لإجراء هذا البحث. وكانت أكثر الأسباب شيوعاً لمشاكل الصوت المزمنة: التهاب الحنجرة المزمن (35.6%)، عقد التئبات الصوتية (22.6%)، اضطراب الصوت الوظيفي (18.6%) و لحميات التئبات الصوتية (13.5%). وكانت أهم عوامل الخطورة الاجتماعية-السكانية ذات الدلالة الاحصائية: المرحلة العمرية 25-44 عاماً، المستوى الاجتماعي المتدنى، و كون المريض يعمل بائعاً، وسكنى المدينة، و النساء كجنس (نسبة أودز =

4.17، 2.01، 1.71، 1.6 و 1.32 على الترتيب). بينما كانت أهم عوامل الخطورة الأكلينيكية ذات الدلالة الاحصائية هي معامل مظاهر ارتجاع الحامض المعوي بالحنجرة والخلق الموجبة، وسوء استخدام الصوت والتدخين (نسبة أودز = 16.94، 8.33 و 6.01 على الترتيب). و بالنسبة لتأثير مشاكل الصوت المزمنة بسبب أمراض الحنجرة المزمنة على نوعية حياة هؤلاء المرضى فقد وُجد إجمالاً أنهم قد سجلوا مستويات أقل مما سجل أفراد المجموعة الضابطة و ذلك في كل المجالات الثمانية لاستبيان نوعية الحياة. وبمقارنة مجموعات المرضى لمشاكل الصوت المزمنة بسبب أمراض الحنجرة المختلفة بالمجموعة الضابطة وُجد أن أغلب المجموعات تتأثر نوعية الحياة لهؤلاء المرضى وذلك في كل المجالات الثمانية لاستبيان نوعية الحياة و ذلك فيما عدا مجموعة المتفرقات.