

# The Association between Laryngectomized Patients' Quality of Life and Their Medical Treatment

Kazuyo Iwanaga<sup>1)</sup>, Kumiko Kotake<sup>2)</sup>, Yoshimi Suzukamo<sup>3)</sup>, Ichiro Kai<sup>4)</sup>, Kaori Haba<sup>2)</sup>, Yuki Nagamatsu<sup>5)</sup>, Aya Takahashi<sup>6)</sup>, Rieko Kawamoto<sup>7)</sup>

School of Nursing, Faculty of Medicine, Fukuoka University<sup>1)</sup>, Juntendo University Faculty of Health care and Nursing<sup>2)</sup>, Department of Physical Medicine and Rehabilitation, Tohoku University Graduate School of Medicine<sup>3)</sup>, The University of Tokyo<sup>4)</sup>, University of Occupational and Environmental Health Department of Nursing<sup>5)</sup>, Saitama Prefectural University, Faculty of Health Sciences Department of Nursing<sup>6)</sup>, Japanese Nursing Association<sup>7)</sup>

## Objectives

1. The purpose of this study is to clarify the QOL of patients who underwent only total laryngectomy and of patients who underwent both total laryngectomy and radiation therapy before discharge from a hospital and 3, 6, 12 months after it.
2. The purpose of this study is to clarify the association between their QOL and medical treatment by comparing the QOL of patients who underwent only total laryngectomy with that of patients who underwent both total laryngectomy and radiation therapy before discharge from a hospital and 3, 6, 12 months after it.

## Methods

Subjects were 58 patients who underwent total laryngectomy in three hospitals located in Prefecture A, Japan, agreed to participate in the research, and returned questionnaires before discharge from hospitals and 3, 6, 12 months after discharge from hospitals. Main study subjects were age, sex, no of family members, employment Status and the QOL, and the data of diagnosis, staging, and medical treatment were collected from medical records. SF-36v2 and mail survey were used in the analysis of the QOL data.

As an analytical method we calculated descriptive statistics of basic attributes and QOL scale scores. Norm-based scoring (NBS) was used in the calculation of the latter.

We confirmed that there was no statistical difference on QOL scale scores in age and staging. Then subjects were classified into two groups: patients who underwent only total laryngectomy and patients who underwent both total laryngectomy and radiation therapy for conducting t-tests to examine their associations with the QOL ( $p < 0.05$ ). This study was approved by ethical review committees of an affiliated university and medical facilities.

**Instrument:** Quality of life was assessed using the SF-36v2. The SF-36v2, a general health status measure, is well validated and commonly used to measure physical, social, role, and emotional functioning. Low scores on the 8 subscales of the SF-36v2 indicate a poorer QOL. We used subscales of SF-36v2 by norm-based scoring (NBS). NBS, which employs a linear T-score transformation with mean = 50 and standard deviation = 10, makes it possible to compare scores for the eight-scale profile.

Subscales: Physical Functioning (PF)  
Role Physical (RP)  
Bodily Pain (BP)  
General Health (GH)  
Vitality (VT)  
Social Functioning (SF)  
Role Emotional (RE)  
Mental Health (MH)

## Results

	mean ± SD (range)	n(%)
Age	67.3± 8.9 (46 - 82)	
Sex	Men	52(89.7)
	Women	6 (10.3)
No of family members	1	8 (12.5)
	2	18 (32.8)
	3	10 (15.6)
	4	10 (18.8)
	5 and over	12 (20.3)
Employment Status	Employed	27 (46.9)
	Unemployed	27 (43.8)
	No respons	3 ( 9.3)

		Medical treatment	
		Total laryngectomy n=23	Total laryngectomy & Radiation therapy n=35
Age(mean ± SD) (range)		68.0±10.3 49-83	66.3±8.7 49-82
Sex(%)	Men	22(95.7)	30(85.7)
	Women	1(4.3)	5(14.3)
Diagnosis(%)	Cancers of larynx	9(39.1)	10(28.6)
	Cancer of hypopharynx	9(39.1)	20(57.1)
	Other head and neck cancers	1 (4.4)	2 (5.7)
	Cancer of cervical esophagus	4(17.4)	3 (8.6)
Stage(%)	I	0	2 (5.7)
	II	5(21.7)	1 (2.9)
	III	8(34.8)	5(14.3)
	IV	10(43.5)	27(77.1)

	before discharge from hospital (n=43)		p	3 months after discharge (n=38)		p	6 months after discharge (n=34)		p	12 months after discharge (n=33)		p	
	Total laryngectomy n=21	Total laryngectomy & Radiation therapy n=22		Total laryngectomy n=19	Total laryngectomy & Radiation therapy n=19		Total laryngectomy n=16	Total laryngectomy & Radiation therapy n=18		Total laryngectomy n=15	Total laryngectomy & Radiation therapy n=18		
	mean ± SE	mean ± SE		mean ± SE	mean ± SE		mean ± SE	mean ± SE		mean ± SE	mean ± SE		
Q O L	PF_N	25.0 ± 3.8	39.5 ± 3.6	.009	30.8 ± 3.7	37.5 ± 3.7	.201	35.2 ± 4.2	39.8 ± 3.8	.426	35.0 ± 3.4	44.5 ± 3.1	.048
	RP_N				28.2 ± 3.7	26.9 ± 3.5	.800	37.1 ± 3.7	36.3 ± 3.4	.877	38.0 ± 4.1	36.5 ± 3.7	.790
	BP_N	47.0 ± 2.3	45.4 ± 2.3	.635	44.0 ± 2.6	40.0 ± 2.6	.287	49.2 ± 2.4	46.2 ± 2.3	.370	51.3 ± 2.4	49.3 ± 2.2	.543
	GH_N	41.5 ± 1.8	46.6 ± 1.8	.051	38.2 ± 2.3	45.6 ± 2.3	.028	43.6 ± 2.4	45.2 ± 2.3	.639	45.9 ± 2.4	48.3 ± 2.2	.459
	VT_N	41.6 ± 2.7	45.4 ± 2.6	.315	42.9 ± 2.8	46.1 ± 2.8	.422	48.8 ± 2.8	45.7 ± 2.6	.441	48.8 ± 2.9	49.0 ± 2.6	.962
	SF_N				34.6 ± 3.4	36.0 ± 3.4	.777	39.3 ± 3.3	37.0 ± 3.1	.612	45.0 ± 3.6	35.2 ± 3.3	.054
	RE_N				31.0 ± 3.8	35.0 ± 3.6	.444	38.0 ± 3.7	34.6 ± 3.4	.496	38.9 ± 4.0	40.6 ± 3.7	.754
	MH_N	39.3 ± 2.9	42.0 ± 3.0	.519	39.5 ± 2.6	42.9 ± 2.6	.370	47.6 ± 3.2	40.0 ± 3.0	.094	50.1 ± 3.1	45.3 ± 2.8	.202

p<.05

There were 43 responses from those who was treated before discharge from hospital. Among them PF\_N of those who underwent only total laryngectomy was  $25.0 \pm 3.8$  (mean and standard deviation) and PF\_N of those who underwent both total laryngectomy and radiation therapy was  $39.5 \pm 3.6$ , showing that there was statistical difference between them ( $p=.009$ ). Yet, there was no statistical difference between them on BP\_N, GH\_N, VT\_N, and MH\_N. (There was no investigation on RP\_N, SF\_N, and RE\_N). There were 38 responses from those who took treatment 3 month after discharge from hospital. GH\_N of patients who underwent only total laryngectomy and of patients who underwent both total laryngectomy and radiation therapy were  $38.2 \pm 2.3$  and  $45.6 \pm 2.3$ , respectively, showing statistical difference between them ( $p = .03$ ). Yet, there was no statistical difference between them on PF\_N, RP\_N, BP\_N, VT\_N, SF\_N, RE\_N, and MH\_N. There were 34 responses from those who took treatment 6 month after discharge from hospital. Yet, there was no statistical difference in every item. There were 33 responses from those who took treatment 12 month after discharge from hospital. PF\_N of patients who underwent only total laryngectomy and of patients who underwent both total laryngectomy and radiation therapy were  $35.0 \pm 3.4$  and  $44.5 \pm 3.1$ , respectively, showing statistical difference between them ( $p = .047$ ). Yet, there was no statistical difference between them on PF\_N, RP\_N, BP\_N, VT\_N, SF\_N, RE\_N, and MH\_N.

## Conclusions

Laryngectomy is done for advanced cancers of the head and neck and of cervical esophageal. Radiation therapy is also used as adjuvant therapy before and after surgery. Total laryngectomy causes several physical problems such as a loss of voice functions, the change of breathing route, the increase of cough and phlegm, and the change of swallowing function and appearance (Armstrong et al., 2001). These physical problems bring about socio-economic problems such as a loss of jobs and fall in income (Kotake, et al. 2005) and other problems such as the loss of human relationship and of social contribution and negative effects on family members. There is also a research which shows that the disruption of social life brings about social trauma and other mental disorders (Bussian et al. 2010). Such physical, psychological, and social problems impair the QOL of laryngectomees severely. This research also revealed that the QOL of patients who underwent total laryngectomy was consistently below the national standard value. Previous studies gained the results that the QOL of patients who underwent only total laryngectomy had no significant difference with the QOL of patients who underwent only chemoradiation therapy (Hanna et al., 2004). Yet, there is no study which compares between the QOL of patients who underwent only total laryngectomy and the QOL of patients who underwent both total laryngectomy and radiation therapy. This research showed that the QOL of patients who underwent total laryngectomy 12 month after discharge from a hospital was lower than the QOL of patients who underwent both total laryngectomy and radiation therapy. This shows that the latter improved their physical functions, compared with the former. PF\_N of those who underwent only total laryngectomy was  $25.0 \pm 3.8$  before discharge from a hospital and  $35.0 \pm 3.4$  twelve month after discharge from a hospital. PF\_N of those who underwent both total laryngectomy and radiation therapy was  $39.5 \pm 3.6$  before discharge from a hospital and  $44.5 \pm 3.1$  twelve month after discharge from a hospital. These results show that in both treatment patients' physical functions improved with time. In this study we examined patients who underwent preoperative, postoperative, and preoperative and postoperative radiotherapy but we could not examine irradiation period due to the size of sample number. This is a future subject. We also need to examine the reasons why physical functions of patients who underwent only total laryngectomy are more likely to improve than those of patients who underwent both total laryngectomy and radiation therapy by focusing on patients' awareness of functional disorder.