EFFECTS OF ANXIETY, DEPRESSION AND FATIGUE ON QUALITY OF LIFE IN EARLY ESOPHAGEAL CANCER PATIENTS FOLLOWING ENDOSCOPIC SUBMUCOSAL DISSECTION

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ABSTRACT

Background: Emotional problems such as anxiety, depression, and fatigue may affect the quality of life (QoL) of cancer patients. However, there are no related studies investigating the effects of emotional problems on the QoL of early esophageal cancer (EC) patients receiving endoscopic submucosal dissection (ESD).

Methods: This is a prospective observational study enrolling 75 early EC patients. Demographic and clinical characteristics of enrolled patients were recorded. QoL was assessed according to the European Organization for Research and Treatment of Cancer QoL (EORTC QLQ-C30). The Beck Anxiety Scale and the Beck Depression Scale were used to measure the severity of anxiety symptoms and depression intensity, respectively. Fatigue was assessed according to the symptom subscale of the EORTC QLQ-C30. Multivariable logistic regression models were constructed to determine the causes of emotional problems.

Results: Of the enrolled early EC patients, 21, 15 and seven had symptoms of mild, moderate and anxiety, respectively. Also, 15, 19 and two patients had symptoms of mild, moderate, and severe, respectively. In total, 27 patients frequently felt fatigue. The multivariable logistic regression model revealed that the financial capacity to pay for treatment had an important effect on the prevalence of anxiety and depression symptoms in enrolled patients (both P values < 0.001). Age, gender, education status, and tumor size also played a role in emotional problems. Mean while, fatigue was found to be related only to age and gender. The mean score for QoL was (76,9 ± 15,2). After adjusting for confounding factors using the multivariable linear regression model, moderate or severe symptoms of anxiety, depression and fatigue, older age, and insufficient capacity to pay were identified as independent risk factors for reduced QoL.

Conclusions: Emotional distress is a significant problem for early EC patients receiving ESD treatment as it may affect their QoL.

Keywords: Anxiety; depression; fatigue; quality of life (QoL); endoscopic submucosal dissection (ESD); early esophageal cancer (early EC), Quality of life, eosophageal cancer, Thai Nguyen Oncology.

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1. INTRODUCTION

Esophageal cancer (EC) is one of the most common malignancies of the upper gastrointestinal tract and is reported to be the sixth leading cause of cancer-related death worldwide [1]. It was estimated that approximately 455,800 new cases of EC and 400,200 deaths occurred globally in 2012. The incidence of esophageal cancer varies among countries, with the highest rates observed in East Asia and Eastern and Southern Africa, and the lowest rates in Western Africa [1]. In China, esophageal cancer ranks sixth among all cancer types, with an estimated incidence of 17.87 per 100,000 people and a mortality rate of 13.6 per 100,000. According to statistics from the World Cancer Association, the early diagnosis rate of esophageal cancer in Vietnam is only about 2%. In contrast, early detection rates for other cancers can reach 20% or even nearly 50%, such as breast and cervical cancers. Consequently, the 5-year survival rate for patients with EC in Vietnam is only around 5%. With the advancement of gastrointestinal cancer screening through endoscopy particularly the development of endoscopic submucosal dissection (ESD) there is now an effective treatment option for early-stage EC. ESD offers several advantages over esophagectomy, including preservation of esophageal function, minimal invasiveness, fewer complications, lower costs and shorter hospital stays. Additionally, quality of life (QOL) after ESD is considered a significant outcome for patients with early-stage EC. Previous studies have mainly focused on the impact of physical issues on the QOL of EC patients, with minimal attention paid to the emotional factors affecting their well-being. Baudry et al. revealed that alleviating emotional distress in EC patients could improve their QOL in both the pre- and post-ESD periods.

Based on this context, we conducted this study with the following objective:

To evaluate the impact of emotional factors on the quality of life of patients with early-stage esophageal cancer after endoscopic submucosal dissection (ESD).

2. SUBJECTS AND RESEARCH METHODS

2.1. Study subjects

All patients newly diagnosed with esophageal cancer (EC) and treated for various purposes at Thai Nguyen Oncology Center from January 2020 to April 2024 who met the inclusion and exclusion criteria.

2.1.1. Inclusion criteria

- Patients aged over 18 years.

- Diagnosed with early-stage EC (cT1aN0M0 or cT1bN0M0) by biopsy or imaging, with no contraindications to endoscopic submucosal dissection (ESD), no prior esophagectomy, and willing to participate in the study. Patients who declined or withdrew their consent could exit the study at any time.

2.1.2. Exclusion criteria

- Patients diagnosed with two concurrent primary cancers.

- Patients with EC who had undergone surgical resection.

- Patients in poor general condition, unable to complete the interview questionnaire.

- Non-cooperative patients or those who refused to answer.

2.2. Study design

Retrospective medical record review.

Sample size:

Purposive sampling method-selecting all patients who met the criteria during the study period.

2.3. Data collection method

Direct interviews with inpatients using administrative information forms and standardized questionnaires on pain levels and quality of life at two time points: prior to hospital admission and before discharge.

2.3.1. Instruments

A demographic questionnaire including age and gender. Patient clinical characteristics were extracted from medical records.

The European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30), version 3, was used. This standardized questionnaire includes 30 items covering: Physical functioning (items 1-5); Role functioning (items 6-7); Emotional functioning (items 21-24); Cognitive functioning (items 20, 25); Social functioning (items 26, 27); Global health status (items 29, 30) and 13 symptom items. A total score of 75 is considered the cut-off: scores <75 indicate poor quality of life (QOL), while scores >75 indicate satisfactory QOL. The Beck Anxiety Scale (BAS) was used to assess anxiety severity. BAS includes 21 self-report items, each scored from 0 to 3, with a total score ranging from 0 to 63: 0-8: Minimal anxiety; 9-15: Mild anxiety; 16-25: Moderate anxiety; 26-63: Severe anxiety. The Beck Depression Scale (BDS) was used to assess the intensity of depression. It also includes 21 items scored from 0 to 3, with total scores ranging from 0 to 63: 0-9: Minimal depression; 10-18: Mild depression; 19-29: Moderate depression; 30-35: Severe depression.

2.3.2. Research ethics

The study protocol was approved by the Ethics Committee of Thai Nguyen Central General Hospital.

Participants were clearly informed and only enrolled with full consent. Data were used strictly for research purposes.

2.4. Data processing

Data were entered and analyzed using SPSS version 22.0. Categorical variables were presented as frequencies and percentages; continuous variables were reported as means and standard deviations.

3. RESEARCH RESULTS

Table 1. Demographic and clinical characteristics of enrolled patients (n = 75)

Characteristics		Number of patients	Percentage %
Male		41	54,7
Female		34	45,3
Age range (years)			
	40 - 50	3	4,0
	50 - 60	17	22,7
	60 - 70	36	48
	70 - 80	13	17,3
	> 80	6	8
Education level			
	Primary school	33	44
	Secondary school	30	40
	High school	12	16
Marital status			
	Married	57	76

Characteristics		Number of patients	Percentage %
	Single/Widowed	18	24
Financial capacity			
	Able to pay	49	65,3
	Unable to pay	26	34,7
Number of comorbidities	0	21	28
	1	17	22,7
	2	37	49,3
Tumor stage			
	T1aNoMo	53	70,7
	T1bNoMo	22	29,3
Tumor location			
	Upper esophagus	7	9,3
	Middle esophagus	55	73,3
	Lower esophagus	13	17,3
Tumor size			
	< 20	49	65,3
	> 20	26	34,7
Tumor circumference involvement			
	<1/2	63	84
	>1/2	12	16
Complete resection rate			
	Complete resection	74	98,7
	Incomplete resection	1	1,3

A total of 92 early-stage esophageal cancer (EC) patients were admitted between January 2020 and April 2024. Thirteen patients declined to participate in this study. The ESD procedure could not be completed in two patients one due to severe bleeding and the other due to fibrosis. Ultimately, 75 early-stage patients were enrolled in this study. The majority of the patients were elderly, with those aged 60-70 years accounting for 48% of the total. There were 41 male patients and 34 female patients. Twelve patients (16%) had completed high school. Fifty-seven patients (76%) were married. As many as one-third of the patients (26 patients, 34.7%) were unable to afford the treatment costs. Thirty-seven patients (49.3%) had at least two comorbidities.

All patients enrolled were diagnosed with early-stage EC, with 53 patients (70.7%) classified as T1aN0M0 and 22 patients (29.3%) as T1bN0M0. The tumor was located in the middle esophagus in 55 patients (73.3%). Tumor size exceeded 20 mm in 26 patients (34.7%). Tumor invasion involving more than half of the esophageal circumference was observed in 12 patients (16%). The complete resection rate was 74 patients (98.7%).

Table 2. Assessment of Emotional Issues in EC Patients (N = 75)

Psychological Factors		N	%
Anxiety			
	Mild	32	42,7
	Moderate	21	28
	Severe	15	20
	Very Severe	7	9,3
Depression			
	Mild	39	52
	Moderate	15	20
	Severe	19	25,3
	Very Severe	2	2,7
Fatigue			
	Present	27	36
	Absent	48	64

Emotional issues including anxiety, depression, and fatigue were assessed in all participating patients. Overall, 32 patients (42.7%) exhibited minimal anxiety symptoms, 21 patients (28%) had mild anxiety symptoms, 15 patients (20%) experienced moderate anxiety and 7 patients (9.3%) reported severe anxiety. Regarding depression, 39 patients (52%) had mild depressive symptoms, 15 patients (20%) had moderate symptoms, 19 patients (25.3%) experienced moderately severe symptoms and 2 patients (2.7%) showed severe depression. As for fatigue, 27 patients (36%) reported feeling fatigued, while 48 patients (64%) did not experience fatigue.

Table 3. Demographic and clinical characteristics associated with emotional issues in early-stage EC patients based on logistic regression model

Characteristic	Anxiety			Depression			Fatigue		
	Minimal or mild	Moderate or severe	P	Minimal or mild	Moderate or severe	P	Absent	Present	P
	53	22		54	21		48	27	
< 60	18 (34,0)	2 (9,1%)	0,045	1 (4,8%)	17 (35,4)				
> 60	35 (66%)	20 (90,9%)		35 (64,8%)	20 (95,2%)		31 (64,65)	24 (88,9%)	0,03
Gender									
Male	33 (62,3%)	8 (36,4%)	0,044	35 (64,8%)	6 (28,6%)	0,006	32 (66,7%)	9 (33,3%)	0,007
Female	20 (27,7%)	14 (63,6%)		19 (35,2%)	15 (71,4%)		16 (33,3%)	18 (66,7%)	

Characteristic	Anxiety			Depression			Fatigue		
	Minimal or mild	Moderate or severe	P	Minimal or mild	Moderate or severe	P	Absent	Present	P
Education									
Primary school	18 (34%)	15 (68,2%)		17 (31,5%)	16 (76,2%)		21 (43,8%)	12 (44,4%)	
Secondary school	24 (45,3%)	6 (27,3%)	0,044	26 (48,1%)	4 (19,0%)	0,034	21 (43,8%)	9 (33,3%)	0,593
High school	11 (20,8%)	1 (4,5%)	0,375	11 (20,4%)	1 (4,8%)	0,654	6 (12,5%)	6 (22,2%)	0,411
Financial status									
Able to pay	43 (81,1%)	6 (27,3%)	< 0,01	45 (83,3%)	4 (19%)	< 0,01	28 (58,3%)	21 (77,8%)	0,094
Unable to pay	10 (18,9%)	16 (72,7%)		9 (16,7%)	17 (81%)		20 (41,7%)	6 (22,2%)	
Comorbidities									
0	16 (30,2%)	5 (22,7%)		14 (25,9%)	7 (33,3%)		13 (27,1%)	8 (29,6%)	
1	10 (18,9%)	7 (31,8%)	0,788	12 (22,2%)	5 (23,8%)	0,462	9 (18,8%)	8 (29,6%)	0,578
>2	27 (50,9%)	10 (45,3%)	0,302	28 (51,9%)	9 (42,9%)	0,692	26 (54,2%)	11 (40,7%)	0,515

Emotional fatigue was analyzed using both univariate and multivariate logistic regression models, as shown in Table 3. The multivariate logistic regression model revealed that older patients (> 60 years) and female patients were more likely to experience moderate to severe anxiety compared to younger or male patients (P = 0.045 and P = 0.048, respectively). Financial capacity to cover treatment expenses had a significant impact on the occurrence of anxiety symptoms in the studied population (P < 0.001). Similarly, age, gender, and financial status also played important roles in the manifestation of depressive symptoms. Additionally, a higher level of education and smaller tumor size appeared to be associated with reduced depressive symptoms to a certain extent (P = 0.048 and P = 0.018, respectively). Fatigue was found to be associated only with age and gender, without significant links to other factors in the model.

Table 4. Quality of life among patients with early-stage EC

Quality of Life Domain	Mean Score ± SD
Physical functioning	88,1 ± 12.9
Role functioning	85,5 ± 16.8
Emotional functioning	77.9 ± 12.5
Cognitive functioning	93.4 ± 14.7
Social functioning	91.0 ± 17.2
Global health status	76.9 ± 15.2

Comment: As shown in Table 4, the mean scores for the enrolled patients were as follows: physical functioning (88.1 ± 12.9), role functioning (85.5 ± 16.8), emotional functioning (77.9 ± 12.5), cognitive functioning (93.4 ± 14.7) and social functioning (91.0 ± 17.2). The mean score for global health status was 76.9 ± 15.2.

4. DISCUSSION

It can be understood that the inability to afford treatment costs is a primary cause of emotional fatigue in patients. Several studies have also emphasized the critical role of financial difficulties in the development of emotional issues among cancer patients. The most important finding of our study is that independent risk factors negatively impact the quality of life (QoL) in patients with early-stage esophageal cancer (EC). Among these, depression was identified as the principal factor influencing QoL, particularly functional status. Previous studies have demonstrated that patients with depression generally have poorer QoL compared to those without. Our findings are consistent with this, showing that depression significantly decreased QoL scores in early EC patients. Moreover, anxiety was also found to contribute similarly to decreased QoL, highlighting the impact of psychological distress on patients with early-stage EC. Bellali et al. suggested that early screening for anxiety and depression could provide valuable insights into vulnerable patients and help inform targeted interventions. Fatigue, a common symptom among cancer patients, was present in 36.0% of our study population. It is noteworthy that fatigue itself is part of the QoL assessment tools. Previous research has demonstrated that fatigue is associated with inflammation, as well as poor sleep quality, particularly in patients with advanced-stage cancer [5]. While multiple factors can contribute to cancer-related fatigue, our study showed that fatigue was associated only with age and gender, likely due to the relatively low cancer burden in early EC patients. Interestingly, tumor characteristics such as tumor location and size were not significantly associated with emotional problems or QoL in early-stage EC. In practice, most early EC patients do not require additional chemotherapy after ESD, and thus ESD does not add a substantial treatment burden. Consequently, reduced QoL was primarily associated with financial difficulties rather than the procedure itself. Several limitations of this study should be considered. First, only 75 early-stage EC patients were enrolled, and the small sample size, combined with the short study duration and single-center design, limited the scope of further analysis. Second, the majority of patients had low educational attainment, which posed challenges in analyzing the impact of education level on emotional issues and QoL. Third, esophageal stricture after ESD is a major factor that can affect recovery and QoL, yet we did not assess the degree of stricture during follow-up in our cohort. In conclusion, ESD is considered an acceptable treatment for early-stage EC and is associated with better QoL outcomes compared to other treatment modalities. Our prospective study identified the prevalence of anxiety, depression, and fatigue among early EC patients following ESD treatment, which may contribute to decreased QoL. These findings emphasize the importance of psychosocial health in patients undergoing ESD and highlight the need to strengthen psychological counseling and support provided by nurses in clinical practice.

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