

## Brief Communication

Symptom Features of Terminally Ill Cancer Patients  
and Depression of Family Caregivers

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**Purpose:** There has been very little study on the associations between patient's symptoms themselves and family caregiver (FC)'s depression in the palliative phase. This cross-sectional study was to investigate the relationship between symptom features of terminally ill cancer patients and their FC's depression. **Methods:** We performed a multicenter survey using the MD Anderson symptom inventory and the Hospital Anxiety and Depression Scale. A total of 293 patient-FC pairs were recruited from seven tertiary medical centers. A multivariate regression analysis was applied for identifying the relevant factors associated with FC depression and for estimating adjusted depression score of FCs. **Results:** Among various psychosocial factors, low FC quality of life, low social support, spouse, and more caregiving time were significantly associated with FCs' depression. According to the presence of FCs' depression, there were significant differences in some symptom characteristics of patients. Even after adjusting for the relevant confounders, depression scores were lower in FCs caring for patients who had negative symptoms (loss of appetite,  $P=0.005$ ; drowsiness,  $P=0.024$ ; and dry mouth,  $P=0.043$ ) than in FCs caring for patients who had not. FCs caring for patients with severe appetite loss had lower depression scores than those with not severe one ( $P=0.039$ ). **Conclusion:** Our result suggests that patient's symptom characteristics might be helpful when evaluating a FC's depression.

**Key Words:** Caregivers, Depression, Neoplasms, Symptom assessment, Terminal care

## INTRODUCTION

Cancer has a considerable impact on physical, emotional, and practical parts of the lives of patients and their family members (1). Especially in palliative phase, the role of family caregiver (FC) is crucial because they are responsible for care to severely ill patients for a long time. Under the great responsibility for the care burden and the confrontation with

an instant separation, family members of cancer patients have a high emotional burden (2).

Depressive disorder is more common among FCs of terminal cancer patients than among patients in other phase of cancer (3). Several studies have been conducted to identify the associated factors with depression of FCs, but few studies have investigated the impact of the patient's characteristics on the FCs' depression (4,5). Cancer patients suffer various symptoms (e.g., pain, weakness, anorexia, dry mouth and constipation) in

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terminal stage of their disease (6), and the symptoms of the patients can influence the FCs' psychological distress (7).

There has been very little study on the associations between patients' symptoms themselves and FCs' depression in the palliative phase. A recent small studies reported that FCs' depression was associated with a patient's trouble sleeping (8) or a discrepancy in the evaluation of constipation between them (9). Thus, this study aimed to investigate the relationship between various symptom features of terminally ill cancer patients and their FC's depression.

## METHODS

A cross-sectional survey was conducted at seven medical centers in Korea during 2014, and 332 consecutive terminally ill cancer patients were recruited. Eligible patients were given information regarding the purpose of study and they were required to identify their primary FC, defined as the person who provided the most informal care and who was  $\geq 20$  years old, able to complete the questionnaire and communicate with the interviewer, and willing to participate. Twenty-nine FCs were excluded because they declined to participate. The FCs completed the self-administered questionnaire with the assistance of an interviewer, when necessary. Data from 293 patient-FC pairs were included in the final analysis. This study complied with the Declaration of Helsinki. Study approval was obtained from the institutional review board at each center and all participants signed written informed consent.

FCs' depression was assessed using the Hospital Anxiety and Depression Scale-Depression (HADS-D), which has been extensively validated in Korean populations (10). HADS-D is composed of seven items and is scored from 0 to 21, with higher scores indicating more severe depression. In the original version, scores are graded in three groups (normal [0~7], borderline abnormal [8~10], and abnormal [11~21]). We categorized subjects into two groups: 'non-depressed (HADS-D, 0~7)' or 'depressed (HADS-D, 8~21).'

Patients' symptoms were measured by the Korean version of the M.D. Anderson symptom inventory (MDASI) (11). The severity of each symptom in the previous 24 h was rated from 0 ("symptom not present") to 10 ("as bad as you can imagine"). We divided into two groups by MDASI scores (12): 'absent (0)' vs. 'present (1~10)' or 'not severe (0~6)' vs.

'severe (7~10).'

Patients' demographic characteristics and functional status (assessed using the European Cooperative Oncology Group Performance Status (ECOG)) were obtained. ECOG 3~4 was considered as poor performance status. The FC survey contained demographic characteristics, relationship to the patient and medical comorbidities. Questionnaires also queried household income and objective burden of care, and these factors were categorized into two groups based on the distribution in the current sample: low income ( $\leq 2$  million Korean Won), frequent visits for caregiving ( $> 5$  d per week), more time spent caregiving ( $> 8$  h per day), and long duration of caregiving ( $> 3$  months). To assess the FCs' quality of life (QOL), we used the Korean version of the Caregiver QOL Index-Cancer (CQOLC). CQOLC consists of 35 items (0=not at all to 4=very much). The total score was 140, with higher scores reflecting a better QOL. The Korean version of the Medical Outcome Study Social Support Survey (MOS-SSS) was used to assess social support systems. MOS-SSS consists of 19 items rated on a 5-point Likert. These variables were classified into two groups, by the median value of the current sample.

Between the two groups according to the FCs' depression, we compared the differences in the characteristics of patient-FC pairs using a  $\chi^2$  test or independent t test. To identify the relevant factors associated with FC depression, we used a stepwise multivariate regression analysis. Adjusted depression score of FCs according to the symptom features of their patients were calculated using a multivariate regression model. The data were analyzed using STATA SE 9 (STATA Corp., TX, USA). For all analyses, we considered P values of less than 0.05 generated in two-sided tests to indicate statistical significance.

## RESULTS

We examined the differences in characteristics of patient-FC pairs according to the presence of FC depression (Table 1). Multivariate analysis revealed that low FC QOL (adjusted odds ratio [aOR], 3.32; 95% confidence interval [CI], 1.90~5.81), low social support (aOR, 1.76; 95% CI, 1.01~3.07), spouse (aOR, 2.38; 95% CI, 1.33~4.28), and more caregiving time (aOR, 2.40; 95% CI, 1.30~4.42) were associated with caregivers' depression (data not shown). There were also significant differ-

**Table 1.** Characteristics by Family Caregivers' Depression.

Characteristics	Non-depressed	Depressed*	P value
	(n=145)	(n=148)	
	%		
<b>Patient</b>			
Young age (<65 yrs)	51.0	57.4	0.272
Male	49.0	64.2	0.009
Poor performance (ECOG 3~4)	72.4	75.0	0.615
<b>Family caregiver</b>			
Old age (≥50 yrs)	42.1	63.5	<0.001
Male	28.6	22.1	0.207
Married	79.3	84.4	0.264
Unemployed	54.5	71.0	0.004
Non-professing a religion	37.4	41.0	0.539
Low educational status (≤high school)	52.1	39.7	0.035
Having a comorbidity	55.2	56.1	0.876
Spouse	27.5	53.9	<0.001
Low QOL (CQOLC total <66)	30.1	63.6	<0.001
Low income (≤2 million KW)	50.7	54.3	0.552
Frequent caregiving (>5 days/week)	55.0	69.6	0.011
More spent caregiving (>8 hours/day)	60.3	81.6	<0.001
Long duration of caregiving (>3 months)	45.8	46.6	0.892
Low social support (MOS-SSS total <74)	41.0	59.6	0.002

ECOG: Eastern Cooperation Oncology Group, QOL: quality of life, CQOLC: Caregiver QOL index-Cancer, KW: Korean Won, MOS-SSS: Medical Outcome Study Social Support Survey.

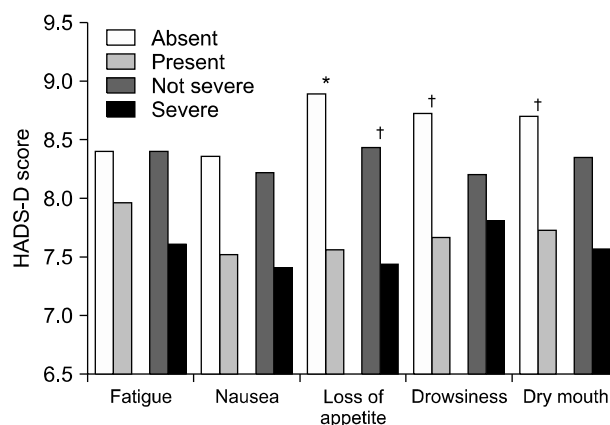
Classifications are based on the distribution of variables in the current sample.

P values are from  $\chi^2$  test.

\*Defined by Hospital Anxiety and Depression Scale-Depression score ≥8.

ences in patient's symptoms by the presence of FC depression (Supplementary Table 1). Patients of non-depressed FCs complained more about fatigue (P=0.003), nausea (P=0.009), loss of appetite (P<0.001), drowsiness (P=0.003) and dry mouth (P=0.005).

The scores were adjusted for identified potential confounders, and the depression scores of FCs by patients' symptom features are depicted in Figure 1. The mean scores of HADS-D was significantly lower in FCs caring for patients who had symptoms such as loss of appetite (P=0.005), drow-



**Figure 1.** Depression score of family caregivers according to the symptom features of their terminally ill cancer patients.

HADS-D: Hospital Anxiety and Depression Scale-Depression. HADS-D scores were adjusted for potential confounders such as caregivers' quality of life, level of social support, relationship to patients, and spent time for caregiving.

\*P<0.01, †P<0.05.

ness (P=0.024) and dry mouth (P=0.043) than in FCs caring for patients who had not. In addition, FCs for patients with severe appetite loss had lower depression scores than those with not severe appetite loss (P=0.039).

## DISCUSSION

In this study, we found that some specific symptoms among terminal cancer patients were inversely related to FC depression. This paradoxical finding can be explained by effects of negative symptoms on the FC's burden. Drowsiness can be directly connected with reduced activity of patients, and thus, the physical burden of FC might be alleviated. The symptoms of appetite loss or dry mouth can also be related to poor oral intake, leading to intravenous nutrition. As the high number of caregiving tasks increase the burden of caregiver (13), increments of negative symptoms may reduce the burden on the caregiver, and thus decrease the rates of depression. Moreover, elder or female caregiver make up a large proportion of FCs in Korea (14), and caregiving for terminal patients can be physically more demanding works for them. Another explanation is the psychological disconnection. Patients and their FCs are psychologically bonded and interact tightly with each other. Patients' suffering can increase psychological burden of FCs (7), however negative symptoms may hinder patients

from expressing their distress. To clarify our results, well designed qualitative studies are needed.

FCs in this study may have had less psychological deterioration than other FCs of terminal cancer patients, because we included patients who were able to consent to the study and the FC was able to complete the survey. This may have underestimated the impact of various factors on depression. Additionally, it should be cautious that HADS-D is not a clinical diagnostic tool for depressive disorder: it was designed to detect depressive mood (15). Although cross-sectional design does not permit definitive statements about causality, our results underscore the consideration of patients' symptom characteristics when evaluating FC depression. Further researches with a longitudinal design are needed.

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#### 요 약

**목적:** 완화적 시기에 말기 암환자의 증상과 가족간병인의 우울 간의 관계에 대한 연구는 매우 드물다. 본 단면연구에서는 말기 암환자의 증상특징과 그들의 가족간병인의 우울 간의 관계에 대해 살펴보고자 하였다.

**방법:** MD Anderson Symptom Inventory와 Hospital Anxiety and Depression Scale을 이용한 다기관 조사가 진행되었다. 총 293쌍의 말기 암환자와 가족간병인이 7개 기관에서 등록되었다. 가족간병인의 우울과 관련된 요인을 추출하고, 보정된 우울점수를 추정하기 위해 다변량 회귀분석이 사용되었다.

**결과:** 다양한 심리사회적 요인들 중, 가족간병인의 낮은 삶의 질, 낮은 사회적 지지, 배우자 관계, 그리고 더 많은 간병시간 등이 가족간병인의 우울과 유의한 관련성을 보였다. 가족 간병인의 우울여부에 따라, 환자의 몇 가지 증상에서 유의한 차이가 관찰되었다. 관련된 혼란변수를 보정한 이후에도, 음성증상이 없는 환자를 돌보고 있는 가족간병인보다 음성증상을 가진 환자를 돌보고 있는 가족간병인에서 우울점수가 유의하게 낮았다(식욕소실,  $P=0.005$ ; 졸음,  $P=0.024$ ; 그리고 입마름,

$P=0.043$ ). 중증의 식욕소실을 가진 환자를 돌보고 있는 가족간병인의 우울점수는 비중증의 식욕소실을 가진 환자를 돌보고 있는 가족간병인의 우울점수보다 낮았다( $P=0.039$ ).

**결론:** 본 연구결과는 가족간병인의 우울을 평가할 때 환자의 증상 특징이 도움이 될 수 있음을 시사한다.

**중심단어:** 간병인, 우울, 암, 증상 평가, 말기 돌봄

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**Supplementary Table 1.** Patient-reported Symptoms and Family Caregivers' Depression.

Variables	Non-depressed (n=145)	Depressed* (n=148)	P value
	Mean±SD		
MDASI (NRS score)			
Pain	5.3±3.0	4.9±2.8	0.233
Fatigue	5.9±2.8	5.0±2.9	0.003
Nausea	3.5±3.4	2.6±2.8	0.009
Insomnia	4.5±3.3	4.3±3.1	0.659
Disgusting	4.0±3.3	3.6±2.9	0.355
Dyspnea	3.8±3.5	3.4±3.2	0.348
Problem with remembering	3.0±3.0	3.0±3.0	0.923
Loss of appetite	5.7±3.3	4.2±3.2	<0.001
Drowsiness	5.4±3.2	4.4±2.9	0.003
Dry mouth	5.8±3.1	4.8±2.9	0.005
Sadness	4.0±3.2	3.6±3.1	0.334
Vomiting	2.5±3.3	1.9±2.6	0.063
Numbness	3.5±3.5	2.8±3.1	0.055
N of symptoms (NRS ≥4)	7.2±3.6	6.0±3.4	0.005
N of uncontrolled symptoms (NRS ≥7)	4.1±3.5	3.0±3.1	0.005

SD: standard deviation, MDASI: MD Anderson Symptom Inventory, NRS: numerical rating scale.

P values are from independent t test.

\*Defined by Hospital Anxiety and Depression Scale-Depression score ≥8.