

Clinician Roles in Symptoms and Signs Improvement among Advanced Cancer Patients

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Research article

Keywords: palliative care, cancer, Korea

Posted Date: October 21st, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-93325/v1>

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Abstract

Background: We study and research how to improve terminally ill cancer patients' symptoms and signs to ease their pain. Furthermore we also seek how the dedicated palliative care service effects on the cancer patients' results.

Methods: We analyzed 334 physician-diagnosed terminally ill cancer patients and categorized them into non-dedicated hospice care group of 234 and dedicated hospice care group of 100.

Results: Symptoms improvement of dyspnea, fatigue, drowsiness, and dry mouth during the first week of admission were respectively 298 (89.2%), 25 (7.5%), 204 (61.1%), 76 (22.8%). Signs improvement of myoclonus, respiratory secretion, leg edema, and ascites between admission and a week after were 5 (1.5%), 41 (12.3%), 47 (14.1%), 12 (3.6%). Significant differences between dedicated hospice care physician group and non-dedicated hospice care physician group were shown in drowsiness (67.5% vs 46 %, $p < 0.001$) and respiratory secretion (15% vs 6%, $p < 0.028$).

Conclusions:In conclusion, terminally ill cancer patients who received palliative or hospice service showed significant improvement in symptoms and illness signs. Moreover, family doctors (dedicated hospice physician group) performed better than oncologist (non-dedicated physician group).

Background

'Well-dying', dying with dignity, has been more important as our society is rapidly becoming an aging society (1). In other words, a growing number of terminally ill patients prefer palliative care to keep their quality of life instead of taking tough treatment to prolong their life by a few weeks or months (2). Therefore, palliative and hospice referral for terminally ill cancer patients is becoming important (3). According to a WHO (World Health Organization)'s report, 37.4% patients who died worldwide could have benefitted from palliative care specialist. Additionally, over 34% cancer patients died without receiving the palliative care, despite they needed the service. In Korea, 7 out of 10 peoples answered that they would use hospice service if they were in a terminal state, and most doctors agreed with it. Additionally, according to a survey, 97% of patients satisfied with the hospice care service they received (4).

Patients with a life expectancy of 6 months or less can get the hospice service if they agree and sign that they no longer want to continue chemotherapeutic treatments. Although there is much difference regarding what hospice and palliative care is and to whom it should be delivered, its delivery and integration in the disease trajectory have been recommended since 1990. Recently, there has been an increasing interest in specialist in palliative care to improve terminally ill cancer patients.

In Korea, there is not government-approved hospice palliative medicine certification system yet, and doctors with any specialty board can perform hospice care after completing a certain education. Most of them are family doctors or oncologists.

Family physicians working in hospitals mainly care only for hospice-palliative patients, while oncologists care a number of inpatients who actively treat cancer as well. Therefore, the task of oncologist is relatively burdensome. Because Palliative physicians need to cope with every aspects of their patients, taking care of too many patients will not only burn out them physically and mentally, but will also make it difficult for them to take care of the patients. As palliative care specialists usually focus more on terminally ill cancer patients' symptom distress, it is possible that they might be more sensitive in catching details of symptoms and sign changes (5).

Therefore, in this study, we hypothesized that the family physicians were the doctors who could be more dedicated to palliative patients, and examined the difference in symptom improvement between the oncologist and the family physicians. However, few studies have compared symptoms according to the level of dedication and clinical intensity within a group of palliative physician. So this article explores whether symptoms and signs improves in terminally ill cancer patients and also examines the available evidence on whether dedicated palliative care interventions or not might have evidence an association with symptoms and signs improvements terminally ill cancer patients.

Methods

Study populations

This study was conducted as one of the secondary analysis of the East-Asian collaborative cross-cultural Study to Elucidate the Dying process (The EASED study), an international multicenter prospective cohort study for the cultural differences of advanced cancer patients at palliative care units (PCUs) in Japan, Korea, and Taiwan. The participating institutions for The EASED study included 22, 11, and 4 PCUs in Japan, Korea, and Taiwan, respectively. Only the Korean data were included for the present analysis, as our main aim was to identify differences in symptom improvements within the group of palliative physicians in Korea. Informed consent was obtained from patients or families (in case of patients' lack of decisional capacity). We enrolled cancer patients who admitted to 11 PCUs in Korea. Inclusion criteria were 1) age 18 or older, 2) locally advanced or metastatic cancer (histological, cytological, or clinical diagnosis), and 3) admitted to the participating PCUs. Exclusion criteria were: 1) patients with scheduled discharge within a week, 2) patients or their families who declined participation. From January 2017 to March 2019, 919 terminally ill cancer patients admitted to the PCUs in 11 hospitals of South Korea, 417 were eligible to the study and a total 334 were analyzed except those who could not follow up, lacked available data or refused to participate in the study. We categorized 334 terminally ill cancer patients into non-dedicated and dedicated hospice care group. In this paper, the definition of dedicated hospice physician was designated as a family doctor who does not have many inpatients other than hospice patients. Oncological and others, which have relatively large patient loadings other than hospice patients, were classified as non- dedicated hospice physician.

Data collection

Measurement outcomes included variables related to dying process, end of life (EOL) care, and demographic data. These measurement outcomes were developed from a systematic literature review on this topic and extensive discussions among the research group (6). We collected data regarding the patients' age, sex, primary cancer sites, comorbidity (items per Charlson Comorbidity Index: CCI), highest level of education, living situation, having children under age 20 years-old, marital status, and psychological factors (emotional stability over the past 3 days). We also collected the data about whether the preference for place for death is hospice unit or not. Symptoms (dyspnea, fatigue, drowsiness, dry mouth) and signs (myoclonus, respiratory secretion, leg edema, ascites) are investigated (at/on) initial admission and one week after the initial investigation, we followed-up symptoms and signs improvements (7). Physicians requested participants to report the intensity of symptoms (fatigue, drowsiness, and dry mouth) based on a scale of 0-5 (0: not at all, 1; slightly, 2; moderately, 3; severe, 4; overwhelmingly, 5; cannot assess) (8). Dyspnea was checked on a scale with 0; no, 1; yes on exertion only, 2: yes at rest. Myoclonus was counted with frequency of jerks/10 sec at rest (0: No, 1: ≤ 1 jerk, 2: 2-3 jerks, 3: 4-9 jerks, 4: ≥ 10 jerks). The severity of respiratory secretion was evaluated using Back's Scale (0: Not audible, 1: Only audible at the head of bed, 2: Clearly audible at the foot of bed, 3: Clearly audible at 6m away from the foot of bed) (9). Peripheral edema on a scale based on severity on the leg with less edema (0: No, 1: Mild (<5mm), 2: Moderate (5-10mm), 3: Severe (>10mm)). Physicians rated the severity of ascites on a scale of 0 to 2 (0: Physically undetectable, 1: Physically detectable but asymptomatic, 2: Symptomatic). We also checked mental status with Memorial Delirium Assessment Scale (MDAS), item 9 MDAS #9, decreased or increased psychomotor activity (10), and Delirium Rating Scale-revised-98 (DRS-R-98), item 2 (Perceptual disturbances and hallucinations). ECOG and Karnofsky performance scales are widely used functional scales that describe the functional ability of cancer patients (11). ECOG ranges from 0 to 5, where 0 means fully active, and 5 means patient death. The Karnofsky scale ranges from 0 to 100, where 0 indicates the dead and 100 indicates the normal. Primary tumors were categorized as lung, breast, gynecologic, gastrointestinal, prostate, pancreas, urologic, head and neck, hematologic, and others. Comorbidities were also collected to allow reporting of patients' Charlson comorbidity index (CCI). The CCI is calculated based on 15 comorbidities (1: myocardial infarction, 2: congestive heart failure, 3: peripheral vascular diseases, 4: cerebral vascular disease, 5: dementia, 6: chronic pulmonary disease, 7: connective tissue disease, 8: gastric ulcer disease, 9: liver disease, 10: diabetes with no end-organ damage, 11: hemiplegia, 12: moderate/severe renal disease ($Cr \geq 3mg/dL$), 13: diabetes with end-organ damage, 14: moderate/severe liver disease (cirrhosis with portal hypertension), 15: AIDS)(12). The definition of improvement is that it improves when it falls below the initial score.

Data analysis

Basic characteristics of each group were compared using the chi-square test. P-values < 0.05 were considered statistically significant. All data were analyzed using SPSS for Windows (version 21.0; SPSS Inc., Chicago, IL, USA).

Results

Table 1 summarizes the demographic characteristics of 334 patients. Mean age of 68-year-old and ECOG more than 2 was 245 (77.3%). Mean hospice stay days were 25.9 days, living with family was 292 (87.7%), having children less than 20 years-old was 15 (4.5%), married status was 226 (67.7%), have religion was 214 (64.1%), emotionally stable was 177 (53.0%), and hospice preference for place of death was 169 (50.6%). Mean clinical experience of palliative care was 8.9 years and mean numbers of terminally ill cancer patients seen in a year was 232.9. Male sex, less education status were significantly higher in dedicated hospice care physician group, as were living with family, having children less than 20 years-old, marriage status, have religion, emotional stability at admission and hospice preference for place of death were not different from dedicated hospice care physician group and non-dedicated hospice care physician group. Clinical experience of palliative care and the numbers of terminally ill cancer patients seen in a year were significantly higher in non-dedicated hospice care physician group.

Table 1
Patient demographic and clinical characteristics

Variable	Total (N=334)	Dedicated hospice care group (N=234)	Non-dedicated hospice group (N=100)	<i>p</i> value *
Age (years)	68.3 ± 12.2	70.0 ± 12.3	66.5 ± 11.5	0.092
Gender				0.023
Male	183 (54.8)	138 (59.0)	45 (45.0)	
Female	151 (45.2)	96 (41.0)	55(55.0)	
Karnofsky (mean, SD)	42.8 ± 17.2	40.8 ± 16.6	47.9 ± 17.5	0.001
ECOG scale				0.025
0	2 (0.6)	2 (0.9)	0 (0)	
1	23 (6.9)	11 (4.7)	12 (12.0)	
2	63 (19.2)	39 (16.7)	25 (25.0)	
3	157 (47.0)	115 (49.1)	42 (42.0)	
4	88 (26.3)	67 (29.5)	21 (21.0)	
Primary tumor				0.046
Lung	49 (14.7)	40 (17.2)	9 (9.0)	
Breast	19 (5.7)	12 (5.1)	7 (7.0)	
Gynecologic	15 (4.5)	9 (3.8)	6 (6.0)	
Gastrointestinal	103 (30.8)	79 (33.8)	24 (24.0)	
Prostate	4 (1.2)	2 (0.9)	2 (2.0)	
Pacnreas	44 (13.2)	28 (12.0)	16 (16.0)	
Urologic	12 (3.6)	9 (3.8)	3 (3.0)	
Head and neck	10 (3.0)	9 (3.8)	1 (1.0)	
Hematologic	41	21 (9.0)	20 (20.0)	

	(12.3)			
Others	37 (11.1)	25 (10.7)	12 (12.0)	
Charlson comorbidity index				0.416
0	148 (63.2)	68 (68.0)		
1	66 (28.2)	25 (25.0)		
2	17 (7.3)	4 (4.0)		
3	3 (1.3)	3 (3.0)		
Duration of PCU admission (days)	25.9 ± 25.9	27.8 ± 24.8	21.5 ± 28.1	0.041
Psychosocial aspect				
Education				0.007
Less than high school	268 (80.2)	197 (84.2)	71 (71.0)	
More than university	66 (19.8)	37 (15.8)	29 (29.0)	
Live family				0.584
Yes	292 (87.7)	207 (88.5)	85 (85.0)	
No	41 (12.3)	27 (11.5)	15 (15.0)	
Children < 20 yrs-old				0.395
Yes	15 (4.5)	9 (3.8)	6 (6.0)	
No	319 (95.5)	225 (96.2)	94 (94.0)	
Marriage				0.799
Unmarried/widowed/separated	108 (32.3)	77 (32.9)	31 (31.0)	
Married	226 (67.7)	157 (67.1)	69 (69.0)	
Religion				0.137
None	120 (35.9)	78 (33.3)	42 (42.0)	
Yes	214	156 (66.7)	58 (5.0)	

	(64.1)			
Peaceful feeling				0.635
No	157 (47.0)	108 (46.2)	49 (49.0)	
Yes	177 (53.0)	126 (53.8)	51 (51.0)	
Preference for place of death				0.721
Hospice	169 (50.6)	120 (51.3)	49 (49.0)	
Others	165 (49.4)	114 (48.7)	51 (51.0)	
Symptoms				
Dyspnea				
At admission	128 (38.3)	90 (38.5)	38 (38.0)	0.519
After 1 week	141 (42.2)	91 (38.9)	50 (50.0)	0.070
Fatigue				
At admission	281 (84.1)	198 (84.6)	83 (83.0)	0.745
After 1 week	259 (77.5)	174 (74.4)	85 (85.0)	0.033
Drowsiness				
At admission	236 (70.7)	180 (76.9)	56 (56.0)	<0.001
After 1 week	221 (66.2)	159 (67.9)	62 (62.0)	0.314
Dry mouth				
At admission	228 (68.3)	160 (68.4)	68 (68.0)	1.000
After 1 week	213 (63.8)	142 (60.7)	71 (71.0)	0.082
Signs				
Myoclonus				
At admission	3 (0.9)	2 (0.9)	1 (1.0)	1.000
After 1 week	6 (1.8)	4 (1.7)	2 (2.0)	1.000

Respiratory secretions				
At admission	44 (13.2)	31 (13.2)	13 (13.0)	1.000
After 1 week	66 (19.8)	53 (22.6)	13 (13.0)	0.051
Leg edema				
At admission	135 (40.4)	97 (41.5)	38 (38.0)	0.627
After 1 week	146 (43.7)	102 (43.6)	44 (44.0)	1.000
Ascites				
At admission	78 (23.4)	57 (24.4)	21 (21.0)	0.573
After 1 week	70 (21.0)	51 (21.8)	19 (19.0)	0.660
Attributes of the physician estimating prognosis				
Clinical experience (years)	17.1 ± 5.3	16.4 ± 5.5	18.8 ± 4.3	<0.001
Clinical experience of palliative care (years)	8.9 ± 4.2	8.7 ± 3.9	9.8 ± 4.8	<0.001
Number of terminally-ill cancer patients seen in a year	232.9 ± 226.3	154.4 ± 79.1	416.8 ± 329.9	<0.001
The sample statistics presented in this table were mean ± standard deviation (SD) for continuous variables and frequency (percentage, %) for categorical variables. The listed <i>p</i> -values of statistical tests were calculated using the Kruskal-Wallis rank sum test for continuous variables and the Chi-square test for categorical variables.				

Table 2 summarizes symptoms and signs improvement of palliative care patients. Symptoms improvement of dyspnea, fatigue, drowsiness and dry mouth between at admission and after 1 week were 298 (89.2%), 25 (7.5%), 204 (61.1%), 76 (22.8%), respectively. Signs improvement of myoclonus, respiratory secretion, leg edema and ascites at admission and after 1 week were 5 (1.5%), 41 (12.3%), 47 (14.1%), 12 (3.6%), respectively. Significant difference between dedicated hospice care physician group and non-dedicated hospice care physician group were drowsiness (67.5% vs 46 %, $p < 0.001$), respiratory secretion (15% vs 6%, $p < 0.028$) improvements.

Table 2

Comparison symptoms and signs improvement whether family medicine palliative care physician

Variable	Total (N=334)	Dedicated hospice care group (N=234)	Non-dedicated hospice group (N=100)	<i>p</i> value *
Symptoms improvement				
Dyspnea	298 (89.2)	210 (89.7)	88 (88.0)	0.701
Fatigue	25 (7.5)	16 (6.8)	9 (9.0)	0.501
Drowsiness	204 (61.1)	158 (67.5)	46 (46.0)	<0.001
Dry mouth	76 (22.8)	54 (23.1)	22 (22.0)	0.887
Signs improvements				
Myoclonus	5 (1.5)	3 (1.3)	2 (2.0)	0.638
Secretion	41 (12.3)	35 (15.0)	6 (6.0)	0.028
Leg edema	47 (14.1)	34 (14.5)	13 (13.0)	0.987
Ascites	12 (3.6)	10 (4.3)	2 (2.0)	0.521
MDAS improvements	7 (2.1)	6 (2.6)	1 (1.0)	0.679
DRS-R-98 improvements	15 (4.5)	13 (5.6)	2 (2.0)	0.247
MDAS: Memorial Delirium Assessment Scale, DRS-R-98: Delirium Rating Scale-revised-98, CCSA: Communication Capacity Scale. The sample statistics presented in this table were frequency (percentage, %) for categorical variables. The listed <i>p</i> -values of statistical tests were calculated using the Chi-square test for categorical variables.				

Discussion

Our study showed that symptoms and signs were improved among terminally ill cancer patients who received hospice care serve. Family doctors (dedicated physician group) outperformed compared to oncologist (non-dedicated physician group) in taking care of the terminally ill cancer patients.

The demand for hospice and palliative care specialists is growing rapidly, because timely palliative care interventions have been shown to improve the quality of care, reduce medical costs, and occasionally

increase longevity (13). These days, the field has expanded from the concept of traditional hospice to supportive and early palliative care, and its role has been extended to provide palliative care for improving quality of life and decision making with aggressive disease treatment in any stage of diseases (14, 15). Therefore, the importance of palliative specialists is also emerging. In Korea, there is not yet government-approved hospice palliative medicine certification system, and a general specialist can perform hospice care after completing a certain education. Most of them are family doctors or oncologists. However, the clinical burden in the two groups is higher in oncologists. Oncologists often treat patients with active chemotherapy as well as palliative patients, which often leads to severe clinical loading, exhaustion of the doctor's own, and difficulty in the delicate care required by palliative patients. Therefore, in this paper, the family doctor was classified as a dedicated group and the oncologist as a non-dedicated group.

Our study showed that dedicated hospice care physician group were significantly improve symptoms and sign improvement than non-dedicated group (drowsiness (67.5% vs 46 %, $p < 0.001$), respiratory secretion (15% vs 6%, $p < 0.028$). In addition, we observed the number(s) of terminally ill cancer patients seen in a year were(was) significantly lower in dedicated hospice care physician group. This result may be partly explained by the fact that proper hospice care management rather than seeing many hospice patients seems to be associated with more attention to help improve symptoms and signs of hospice patients. In addition, since family doctors are accustomed to various symptoms and diseases, it is considered to be easier to access the symptoms of terminally ill patients more comprehensively. Also, they have been trained not only on physical symptoms, but also on psychosocial symptoms and communication with patients.

In Korean medical situations, oncologists have a relatively large number of outpatient and inpatient burdens compared to dedicated hospice care physician, and eventually it can be very heavy work to focus on hospice care. Of course, one doctor in a dedicated Palliative care unit (PCU) cannot take care of more than 20 in-patients of the PCU according to the designated hospice ward regulations, but oncologist also have patients in other oncology ward and there are many difficulties in the reality of each hospital environment. In this study, due to the nature of treatment environment in Korea, the difference in the intensity of work between the two occupations was considered, and the family doctor was expressed as a dedicated doctor. However, regardless of the specialty board, it is considered that the environment in which dedicated palliative physicians who have been trained and can concentrate on palliative patients will be very important.

A randomized controlled trial of early palliative care among patients with advanced non-small-cell lung cancer (16), palliative care specialists usually use their time focusing on 3 things: managing symptoms, engaging patients in emotional work; and serving as a moderator between the oncologist and the patient. In fact, clinicians treating cancer patients offer general palliative care, regardless of their specialty. Most palliative care provided to patients with cancer outside the designated hospice ward or designated hospice hospital can be called "primary palliative care" or "general palliative care" for this type (17). However, palliative care specialists can perform a higher level of care. They can provide additional expertise to promote optimal symptom management and effective communication, and they are more

effective in dealing with patients and many prognostic uncertainties. It is also shown that patients can act as intermediaries or mediators in communication with the attending physician and other professionals in relation to the psychosocial aspects that the patient cannot talk to. These are thought to be areas that can be handled by dedicated palliative specialists trained to be interested in both psychosocial and physical problems.

Our study showed that only 50 percent of hospice care patient prefer hospice units as a place of death. Place of death also has an important meaning in the distribution of medical resources. In other words, hospital deaths need more medical resource than home or hospice death. Many studies have shown that most people prefer to die at home, but most do not agree with the preference for the place of death and the actual place of death (18). 13% (Canada) to 53% (Mexico) of people died at home and 25% (the Netherlands) to 85% (South Korea) died in hospital (19). These country-specific differences cannot be merely explained by socio-demographic characteristics, causes of death or available medical resources, but also appear to be related to the country's terminal care and mitigation policies. The first hospice clinic in Korea opened in 1965, hospice care policy and facilities developed quite slowly up until 2000. The government policies for hospice and palliative care (HPC) developed in 2005 (20) have resulted in rapid increase in the number of designated palliative care units (PCU) in Korea, which as of 2020 totaled 87. However, the utilization of HPC among Korean cancer decedents has been reported as low as 22.0% in 2017 and almost half of patients who were admitted to a hospice care units died within 15 days. This means that even for hospice users, a significant number of people with terminally ill cancer patients referred to HPC very late. We need to continually promote the hospice and palliative care to the public, develop nationally certified palliative physician specialists on this, and need a system that will ease the other medical burdens of palliative physician already in charge of hospice care. In Taiwan, family medicine residents can obtain a palliative medicine specialty board with family medicine board at the same time after a certain period of training. In Korea this year, the first hospice accreditation system was implemented to produce palliative specialists by KOREAN SOCIETY FOR HOSPICE AND PALLIATIVE CARE, but this is not an officially recognized specialty certification or board system in the country, so it should be converted into a specialist board certification system in the near future.

There are some limitations to our study. First, there is no verified definition for the classification of the dedicated and non-dedicated groups. In the future, it is expected that further studies, comparing with specific data like a patients numbers or physician's clinical loading, will be needed. Second, due to the secondary analysis, the sample size was not calculated in this study, and finally, the number of symptoms and signs was limited and was a surrogate measure, not a patient-reported result. Finally, we were not adjusted nursing, social work, spiritual and other supports for symptoms and signs improvements for hospice patients. Further prospective study elucidate this limitations.

Conclusions

In conclusion, terminally ill cancer patients who received palliative or hospice service showed significant improvement in symptoms and illness signs. Moreover, family doctors (dedicated hospice physician

group) performed better than oncologist (non-dedicated physician group). Finally we need to conduct clinical trial as well as the basic research associated with dedicated hospice care, and these data can be the foundation of future advanced hospice and palliative care development.

List Of Abbreviations

WHO: World Health Organization

The EASED study : the East-Asian collaborative cross-cultural Study to Elucidate the Dying process

PCU: palliative care units

EOL: end of life

CCI: Charlson Comorbidity Index

HPC: hospice and palliative care

MDAS Memorial Delirium Assessment Scale

DRS-R-98: Delirium Rating Scale-revised-98

Declarations

Ethics approval and consent to participate:

The IRB committee of Catholic Kwandong university, St.Mary's hospital approved the study (the committee's reference number: 17 Yeon IRB011)

Consent for publication:

Not applicable

Availability of data and materials:

Not applicable

Competing interests:

The authors declare that they have no competing interests

Funding:

This study was supported by a Grant-in-Aid from the Japan Hospice Palliative Care Foundation (2015 grant); MEXT KAKENHI (Grant-in-Aid for Scientific Research) Grant Numbers 16H05212 and 16KT0007; Ministry of Science and Technology, Taiwan, 105-2314-B-002 -172

Authors' contributions:

All authors contributed to the conception, analysis, interpretation, revision, and final preparation of the manuscript. SH Kim served as the principal investigator and had full access to all study data. JH Chung takes responsibility for writing manuscript, the data integrity and accuracy of the data analysis.

Acknowledgements:

Not applicable

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