Differences between dedicated and not dedicated hospice physicians in symptoms and signs improvement among advanced cancer patients

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Abstract

The hospice and palliative care can improve the symptoms and signs of terminal cancer patients. The purposes of this study are how to improve terminally ill cancer patients’ symptoms and signs and how the dedicated palliative care service effects on these improvements.

From January 2017 to March 2019, among 919 terminally ill cancer patients admitted to the palliative care units in 11 hospitals of South Korea, we analyzed 334 patients with prospective cohort method and categorized them into non-dedicated hospice care group of 234 and dedicated hospice care group of 100.

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 < .001) and respiratory secretion (15% vs 6%, P < .028). Compared to non-dedicated care group, the odds ratio for more than 2 symptoms or signs was 1.78 (95% confidence interval, 1.05–3.02) in the dedicated care group after adjusting confounding variables.

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

Abbreviations: CCI = Charlson comorbidity index, DRS-R-98 = Delirium Rating Scale-revised-98, ECOG = Eastern Cooperative Oncology Group, HPC = hospice and palliative care, MDAS Memorial Delirium Assessment Scale, PCU = palliative care units, The EASED study = the East-Asian collaborative cross-cultural Study to Elucidate the Dying process.

Keywords: cancer, Korea, palliative care
1. Introduction

Well-dying (dying with dignity) has become important as our society is rapidly becoming an aging society. 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. Therefore, palliative and hospice referral for terminally ill cancer patients is becoming important. According to a World Health Organization’s report, 37.4% patients who died worldwide could have benefited 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 people answered that they would use hospice service if they were in terminal state, and most doctors agreed with it. Additionally, according to a survey, 97% of patients satisfied with the hospice care service they received.

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. Recently, there has been an increasing interest in specialist in palliative care to improve terminally ill cancer patients. There is not government-approved hospice palliative medicine board certification system yet in Korea, so any doctors can perform hospice care after completing a certain education. Most of them are family doctors or oncologists.

Family physicians in general hospitals focus on taking care only for hospice-palliative inpatients, 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 them out 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 identifying details of symptoms and sign changes.

Therefore, we hypothesized that the family physicians who could be more dedicated to palliative patients, and examined the difference in symptom improvement between the oncologist and the family physicians, but few studies have compared symptoms according to the level of dedication and clinical intensity within a group of palliative physician. Therefore this study shows 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.

2. Methods

2.1. 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 (Fig. 1). 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.

2.2. Data collection

Measurement outcomes included variables related to dying process, end of life care, and demographic data. These measurement outcomes were developed from a systematic literature review on this topic and extensive discussions among the research group. We collected data regarding the patients’ age, sex, primary cancer site, 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 initial admission and 1 week after the initial investigation, we followed-up symptoms and signs improvements.

Physicians requested participants to report the intensity of symptoms (fatigue, drowsiness, and dry mouth) based on a scale of on scale of 0 to 5 (0: not at all, 1: slightly, 2: moderately, 3: severe, 4: overwhelmingly, 5: cannot assess). 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/10seconds 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 6 m away from the foot of bed). Peripheral edema was measured on a scale based on severity on the leg with less edema (0: no, 1: mild [<5 mm], 2: moderate [5–10 mm], 3: severe [>10 mm]). 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) and Delirium Rating Scale-revised-98 (DRS-R-98), item 2 (perceptual disturbances and hallucinations). Eastern Cooperative Oncology Group (ECOG) and Karnofsky performance scales are widely used functional scales that describe the functional ability of cancer patients. 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’ 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 ≥ 3 mg/dL), 13: diabetes with end-organ damage, 14: moderate/severe liver disease (cirrhosis with portal hypertension), 15: AIDS.[14] The definition of improvement is that it improves when it falls below the initial score.

2.3. Data analysis

Basic characteristics of each group were compared using the chi-square test.

The association between dedicated care group and symptoms & signs improvements was analyzed using the multiple logistic regression analysis adjusted for age, sex, Karnofsky score, ECOG scale, CCI, PCU admission duration, education level, living with family, having children <20 years-old, religion, peaceful feeling and preference for place of death. P values <.05 were considered statistically significant. All data were analyzed using SPSS for Windows (version 21.0; SPSS Inc., Chicago, IL).

3. 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 245 (77.3%). 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 <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 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 < .001), respiratory secretion (15% vs 6%, P < .028) improvements. Table 3 showed odd ratios for the association between dedicated hospice care and symptoms & signs improvements (≥2 symptoms or signs improvements). Compared to non-dedicated care group, the odds ratio (OR) for more than 2 symptoms or signs was 1.78 (95% confidence interval, 1.05–3.02) in the dedicated care group after adjusting age, sex, Karnofsky score, ECOG scale, CCI, PCU admission duration, education level, living with family, having children <20 years-old, religion, peaceful feeling and preference for place of death.

4. Discussion

Our study showed that symptoms and signs were improved among terminally ill cancer patients who received hospice care service. 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 (HPC) 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.[15] 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.[16,17] Therefore, the importance of palliative specialists is also emerging. In Korea, there is not government-approved hospice palliative medicine certification system yet, and general specialists can perform hospice care after completing a certain education. Most of them are family doctors and oncologists. However, the clinical burden in the 2 groups is thought to be higher for oncologists. Oncologists often treat patients with active chemotherapy as well as palliative patients, which can 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 < .001), respiratory secretion (15% vs 6%, P < .028). In addition, we observed the number(s) of terminally ill cancer patients seen in a year were significantly lower in dedicated hospice care
| Variable                      | Total (N=334) | Dedicated hospice care group (N=234) | Non-dedicated hospice group (N=100) | P value*
|-----------------------------|----------------|-----------------------------------|-----------------------------------|----------
| Age (yr)                     | 68.3 ± 12.2    | 70.0 ± 12.3                       | 66.5 ± 11.5                       | .092     |
| Gender                       |                |                                   |                                   | .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                       | .001     |
| ECOG scale                   |                |                                   |                                   | .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                |                |                                   |                                   | .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)                           |          |
| Pancreas                     | 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 (12.3)      | 21 (9.0)                          | 20 (20.0)                         |          |
| Others                       | 37 (11.1)      | 25 (10.7)                         | 12 (12.0)                         |          |
| Charlson comorbidity index   |                |                                   |                                   | .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 (d)| 25.9 ± 25.9    | 27.8 ± 24.8                       | 21.5 ± 28.1                       | .041     |
| Psychosocial aspect          |                |                                   |                                   |          |
| Education                    |                |                                   |                                   | .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                  |                |                                   |                                   | .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         |                |                                   |                                   | .395     |
| Yes                          | 15 (4.5)       | 9 (3.8)                           | 6 (6.0)                           |          |
| No                           | 319 (95.5)     | 225 (96.2)                        | 94 (94.0)                         |          |
| Marriage                     |                |                                   |                                   | .799     |
| Unmarried/widowed/separated  | 108 (32.3)     | 77 (32.9)                         | 31 (31.0)                         |          |
| Married                      | 226 (67.7)     | 157 (67.1)                        | 69 (69.0)                         |          |
| Religion                     |                |                                   |                                   | .137     |
| None                         | 120 (35.9)     | 78 (33.3)                         | 42 (42.0)                         |          |
| Yes                          | 214 (64.1)     | 156 (66.7)                        | 58 (58.0)                         |          |
| Peaceful feeling             |                |                                   |                                   | .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|                |                                   |                                   | .721     |
| Hospice                      | 169 (50.6)     | 120 (51.3)                        | 49 (49.0)                         |          |
| Others                       | 165 (49.4)     | 114 (48.7)                        | 51 (51.0)                         |          |
| Symptoms                     |                |                                   |                                   |          |
| Dyspnea                      |                |                                   |                                   | .519     |
| At admission                 | 128 (38.3)     | 90 (38.5)                         | 38 (38.0)                         |          |
| After 1 wk                   | 141 (42.2)     | 91 (38.9)                         | 50 (50.0)                         | .070     |
| Fatigue                      |                |                                   |                                   | .745     |
| At admission                 | 281 (84.1)     | 198 (84.6)                        | 83 (83.0)                         |          |
| After 1 wk                   | 259 (77.5)     | 174 (74.4)                        | 85 (85.0)                         | .033     |
| Drowsiness                   |                |                                   |                                   | <.001    |
| At admission                 | 236 (70.7)     | 180 (76.9)                        | 56 (56.0)                         |          |
| After 1 wk                   | 221 (66.2)     | 159 (67.9)                        | 62 (62.0)                         | .314     |
| Dry mouth                    |                |                                   |                                   |          |
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 physicians, and eventually it can be very heavy work to focus on hospice care. One doctor in a dedicated 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. Since hospice care requires meticulous care in addition to the medical part of each patient, it is not easy for one doctor to provide delicate care when there are many patients to be cared for. In addition, due to the characteristics of terminal cancer, the physical and mental fatigue of medical staff can be very great. The number of hospice patients that can be treated in Korea is limited to 20 patients per doctor, but this number is not small. Thus, if fewer patients were to be cared for, or freed from non-HPC tasks, doctors would be able to provide much more efficient and sophisticated care to their patients.

### Table 1
(continued).

| Variable | Total (N = 334) | Dedicated hospice care group (N = 234) | Non-dedicated hospice group (N = 100) | P value* |
|----------|----------------|----------------------------------------|--------------------------------------|----------|
| At admission | 228 (68.3) | 160 (68.4) | 68 (68.0) | 1.000 |
| After 1 wk | 213 (63.8) | 142 (60.7) | 71 (71.0) | .082 |

| Signs | Myoclonus | Respiratory secretions | Leg edema | Ascites |Attributes of the physician estimating prognosis |
|-------|-----------|------------------------|-----------|---------|-----------------------------------------------|
| At admission | 3 (0.9) | 44 (13.2) | 135 (40.4) | 78 (23.4) | Clinical experience (yr) 17.1 ± 5.3 |
| After 1 wk | 6 (1.8) | 31 (13.2) | 102 (34.3) | 51 (15.0) | Clinical experience of palliative care (yr) 8.9 ± 4.2 |
| | | | | | Number of terminally-ill cancer patients seen in a year 232.9 ± 226.3 |

The sample statistics presented in this table were mean ± standard deviation (SD) for continuous variables and frequency (percentage, %) for categorical variables.

### 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) | P value* |
|----------|----------------|----------------------------------------|--------------------------------------|----------|
| Symptoms improvement | Dyspnea 298 (89.2) | 210 (89.7) | 88 (88.0) | .701 |
| | Fatigue 25 (7.5) | 16 (6.8) | 9 (9.0) | .501 |
| | Drowsiness 204 (61.1) | 158 (67.5) | 46 (46.0) | <.001 |
| | Dry mouth 76 (22.8) | 54 (23.1) | 22 (22.0) | .887 |
| Signs improvements | Myoclonus 5 (1.5) | 3 (1.3) | 2 (2.0) | .638 |
| | Secretion 41 (12.3) | 35 (15.0) | 6 (6.0) | .028 |
| | Leg edema 47 (14.1) | 34 (14.5) | 13 (13.0) | .987 |
| | Ascites 12 (3.6) | 10 (4.3) | 2 (2.0) | .921 |
| | Sw & Sn improvements 126 (37.7) | 98 (41.9) | 28 (28) | .019 |
| | MDAS improvements 7 (2.1) | 6 (2.6) | 1 (1.0) | .679 |
| | DRS-R-98 improvements 15 (4.5) | 13 (5.6) | 2 (2.0) | .247 |

CCSA = Communication Capacity Scale, DRS-R-98 = Delirium Rating Scale-revised-98, MDAS = Memorial Delirium Assessment Scale.

The sample statistics presented in this table were frequency (percentage, %) for categorical variables.

*The listed P values of statistical tests were calculated using the chi-square test for categorical variables.
In this study, due to the nature of treatment environment in Korea, the difference in the intensity of work between the 2 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,[18] 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.[15] 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% 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.

| Table 3 | Odd ratios of the association between dedicated hospice care and symptoms & signs improvements (≥2 symptoms or signs improvements). |
|---------------------------------|-------------------------------------------------------------|
| OR (95% confidence interval)     |                                                              |
| Non-dedicated hospice care group | Reference                                                   |
| Dedicated hospice care group     | 1.78 (1.05–3.02)                                           |

Adjusted for age, sex, Karnofsky score, ECOG scale, Carlson comorbidity index, PCU admission duration, education level, living with family, having children <20 yr-old, religion, peaceful feeling and preference for place of death.

5. Conclusion

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 HPC development.

Author contributions

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