Original Article

Advance Care Planning (ACP) Associated with Reduced Health Care Utilization in Deceased Older Patients with Advanced Stage of Chronic Diseases

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Objective: To investigate the prevalence of advance care planning (ACP) among cancer and non-cancer patients in the advanced stages of their illnesses and to explore the association of ACP and health care utilization.

Materials and Methods: A retrospective review of patients aged 60 years or more who were admitted and died during the year 2013 was conducted. The cases with advanced diseases were selected and categorized into cancer and non-cancer groups. Any discussion regarding planning for preferred treatments and procedures to be delivered in the event of critical illness was defined as ACP. Comparisons were performed between patients with and without documented ACP.

Results: There were 279 cancer and 381 non-cancer patients. The prevalence of documented ACP among the cancer and non-cancer patients were 60.6% and 35.7%, respectively (p<0.001). For both groups, ACP resulted in lower median length of hospital stay (p<0.001), lower rates of performing invasive procedures (p<0.001), and lower total costs of care (p<0.001).

Conclusion: ACP was not carried out for a substantial proportion of older patients in the advanced stages of their illnesses, especially among non-cancer patients. Implementing ACP at the optimal time for older patients, particularly in the case of non-cancer patients, might improve their quality of care, diminish the utilization of unnecessary procedures, and lower the total costs of care.

Keywords: Advance care planning, Invasive procedure, Length of hospital stay, Cost of care, Cancer, Non-cancer

J Med Assoc Thai 2019;102(7):801-8
Website: http://www.jmatonline.com
Received 11 Apr 2019 | Revised 26 Apr 2019 | Accepted 3 May 2019

Advance care planning (ACP) is a comprehensive process involving patients, their families, and health care teams to identify patients' goals, values, and desired outcomes, instead of focusing only on curative treatments. ACP appears to be a crucial process that can improve the quality of care for patients with advanced diseases[1,2]. Several studies have shown that ACP benefits patients by improving their quality of life and possibly lowering the incidence of unnecessary health care interventions and reducing costs[3-5]. However, documentation of ACP is infrequently carried out, especially among non-cancer patients with advanced disease[6,7].

The degree of acceptance of carrying out ACP might differ to a certain extent between western and eastern cultures[8]. In Thailand, a county with an eastern culture, there have been few studies exploring the attitudes of physicians and older patients toward the care provided at the end-of-life period and the documentation of advance directives (AD)[9-11]. Interestingly, although older patients are inclined to choose invasive interventions when the prognosis of treatment is not revealed[9], most decline to receive futile life-sustaining treatments[11]. Another study has shown the usefulness of AD in that they might reduce unnecessary life-sustaining treatments[12]. Nevertheless, that research also found that documenting AD was disturbing for study patients

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How to cite this article: Suraarunsumrit P, Nopmaneejumruslers C, Srinonprasert V. Advance Care Planning (ACP) Associated with Reduced Health Care Utilization in Deceased Older Patients with Advanced Stage of Chronic Diseases. J Med Assoc Thai 2019;102:801-8.

in northern Thailand. Despite having the support of experienced practitioners, the patients tended to reject suggestions to record their AD[12].

The concept of ACP in Thailand has not been widely embraced, and studies to explore the practice of AD documentation in routine care have been limited[9]. Moreover, no studies have been published on the extent to which treatment is provided to patients with advanced disease in accordance with AD in real-life practice. Therefore, the present study aimed to firstly, investigate the prevalence of ACP documentation, and secondly, explore the effects of ACP on health care utilization by cancer and non-cancer patients in the advanced stages of their illnesses at a university hospital in central Thailand.

Materials and Methods

Study design

A retrospective study was carried out on a cohort of older patients who were admitted and died in 2013 at a university hospital that accepted referrals from all parts of Thailand. The inclusion criteria were patients who were at least 60 years old at the time of admission, had an advanced stage of disease in accordance with predefined criteria drawn from previous studies[13,14] (Table 1), and were deemed appropriate for palliative care. Excluded were the medical records of patients with inadequate data to make decisions regarding their previous medical conditions or physical status. The potentially eligible patients were categorized into two groups related to the causes of death, namely, cancer and non-cancer deaths. When the patient had both cancer and non-cancer conditions, the authors decided to choose the one that would be more likely to limit their life expectancy. The causes were noted from death certificates that had been issued by the medical residents in charge, who were all trained in the hospital's procedures.

Data collection

Data from all available medical records of the eligible patients, including both the outpatient and inpatient settings at Siriraj Hospital, were reviewed. The information collected included the patients' characteristics, which comprised their demographic data, medical co-morbidities, and details of any related events occurring during the last admission such as the causes of death, the length of hospital stay, the total costs of care, and all interventions performed including invasive procedures.

The ACP in the present study included all documentation of any discussions relating to the health care plans for patients should they were in critical illnesses. This could include goals of care they have and wishes to receive any invasive procedures such as cardiopulmonary resuscitation (CPR), central catheter insertion, or any life sustaining procedures when indicated. Generally, such documentation should note patients' attitudes and wishes, and not be simply restricted to details of the use or non-use of potential medical interventions. However, in the present study, ACP documentation may not necessarily have been completely discussed in all possible aspects. ACP documentation was extensively sought from both the outpatient and inpatient medical files at the studied hospital. When ACP documentation was discovered, the interval from the first recorded deliberation of the ACP to death was noted, and details of the disease-specific and the more general, life-sustaining, ACP interventions were compiled. The research protocol was approved by the Siriraj Institutional Review Board.

Outcome measures

The outcome measures were the prevalence of ACP and the association of ACP and quantity of health care utilization. The prevalence was determined by the episode that ACP-related documentation was present in the medical files at Siriraj Hospital. The health care utilization included all invasive interventions carried out, the length of hospital stays (as documented in medical records), and the direct medical care costs (as retrieved from the hospital's finance department).

Statistical analysis

The cases were divided into four groups (namely, cancer patients with and without ACP documentation, and non-cancer patients with and without ACP documentation) but the comparisons for the effects of ACP on health care utilization were made within cancer and non-cancer groups. Independent sample t-test or the Mann-Whitney U test were used, according to the distribution of the data, for continuous data. The categorical variables were analyzed by using the chi-squared test or Fisher's exact test, as appropriate. Two-tailed p-values less than 0.05 were considered statistically significant. All analyses were performed with SPSS Statistics for Windows, version 18.0 (SPSS Inc., Chicago, IL, USA).

Ethics approval

The Siriraj Institutional Review Board of the Faculty of Medicine Siriraj Hospital, Mahidol University approved the conduct of the study.

Table 1. Definitions used for advanced diseases in the study (adapted from Knaus et al[13] and Stuart[14])

Diseases or conditions	Criteria
Advanced cancer	Metastatic cancer patients not suitable for chemotherapy decided by treating physicians
Severe dementia	Dementia with total dependence of basic activities of daily living
Bedridden status	Bed bounded and not able to communicate with caregiver ≥6 months
Advanced heart disease	Both must be present
	- Significant symptoms of recurrent congestive heart failure, dyspnea at rest classified as NYHA Class IV
	- Uncontrolled cardiac disease on optimal treatment with medications or not to be candidates for invasive procedures (echocardiography showed ejection fraction <20%)
Advanced renal disease	Both must be present
	- The patient decline dialysis or renal transplant
	- Creatinine clearance <10 mL/minute and serum creatinine >8.0 mg/dL
	Supporting documentation (optional)
	- Uremia or uremic pericarditis
	- Urine output <400 mL/day
	- Hepatorenal syndrome
	- Intractable hyperkalemia (>7.0 mmol/L) not responsive to treatment
	- Intractable fluid overload, not responsive to treatment
Advanced lung disease	Both must be present
	- Severe chronic lung disease as documented by both a and b
	a. Disabling dyspnea at rest, poorly or unresponsive to bronchodilators (FEV1 <30%)
	b. Progression of end stage pulmonary disease, as evidenced by increasing visits to the emergency department >1 time/year or hospitalizations for pulmonary infections or respiratory failure
	- Hypoxemia with evidence characterized by oxygen saturation ≤88% (room air) or the partial pressure of arterial oxygen ≤55 mmHg
Advanced liver disease	Both must be present
	- At least one of the following
	a. Ascites, refractory to treatment
	b. Spontaneous bacterial peritonitis
	c. Hepatorenal syndrome (elevated creatinine and blood urea nitrogen with oliguria (urine output <400 mL/day)
	d. Hepatic encephalopathy, refractory to treatment
	e. Recurrent variceal bleeding, despite intensive therapy
	- Evidenced with both a and b
	a. Prothrombin time >5 seconds, or INR >1.5
	b. Serum albumin <2.5 gm/dL
Septic shock	Septic shock with evidence of multiple organ failure

NYHA=New York Heart Association Functional Classification; FEV1=forced expiratory volume in one second; INR=international normalized ratio

Results

In 2013, 824 older inpatients died at Siriraj Hospital. One hundred ten of those cases were excluded due to having incomplete medical records, resulted in 660 who met at least one eligibility criterion. They were divided into two groups, 279 cancer patients, and 381 non-cancer patients. The mean ages of the cancer and non-cancer patients were 73 and 78 years, respectively (Table 2).

In both groups, most patients had septic shock with multiple organ failure, with or without other advanced diseases (65.4% of the non-cancer patients,

Table 2. Comparison of baseline characteristics of cancer and non-cancer groups

Demographics	Cancer (n=279) n (%)	Non-cancer (n=381) n (%)
Age (years), Mean±SD	73.1±9	78.5±9
Sex: male	172 (61.6)	183 (48.0)
Payer		
Universal coverage	73 (26.2)	111 (29.1)
Social insurance	10 (3.6)	9 (2.4)
Civil service welfare	173 (62)	244 (64)
Self-paying	23 (8.2)	17 (4.5)
Ward		
General medical wards	177 (63.4)	292 (76.6)
Intensive care units	23 (8.2)	63 (16.5)
Special wards	79 (28.3)	26 (6.8)
Religion		
Buddhism	278 (99.6)	368 (96.8)
Others*	1 (0.4)	12 (3.2)
ADL		
Independent	44 (15.9)	49 (12.9)
Partially dependent	157 (56.7)	140 (36.7)
Totally dependent	73 (26.4)	191 (50.1)
Unknown	3 (1.1)	1 (0.3)
Residence		
Home	258 (92.5)	356 (93.4)
Nursing home	4 (1.4)	14 (3.7)
Others	5 (1.8)	2 (0.5)
Unknown	12 (4.3)	9 (2.4)
Comorbidities#, Mean	3.25	4.44
Hypertension	142 (50.9)	277 (72.7)
Cerebrovascular disease	19 (6.8)	117 (30.7)
Chronic kidney disease	35 (12.5)	148 (38.8)
Type 2 diabetes mellitus	79 (28.3)	156 (40.9)
Coronary artery disease	32 (11.5)	129 (33.9)
Dementia	11 (3.9)	57 (14.9)
COPD/asthma	13 (4.7)	58 (15.2)

SD=standard deviation; ADL=activities of daily living; COPD= chronic obstructive pulmonary disease

* Christianity, Islam, # One patient had more than one comorbidity

and 50.9% of the cancer patients). In the case of the patients in the cancer group, the most common cancer was gastrointestinal (GI) malignancy, followed by hematologic malignancy and lung cancer. As to the non-cancer group, 33.1% and 14.9% of the patients were bedridden and severely demented, respectively. Most of the cancer patients died from GI malignancy (39.8%), whereas the non-cancer patients died predominantly from pneumonia (26.0%).

The prevalence of ACP was higher among the cancer than the non-cancer patients (60.6% and 35.7%, respectively; $p<0.001$). Most ACP was documented by residents in internal medicine, and only 10.2% of the cancer patients and 3.7% of the non-cancer patients were involved in the process of ACP. The median interval of the period from the date of the first documentation of the ACP to the date of death was similar for the two groups (5 days and 4.5 days, $p=0.36$). However, documentation related to ACP that occurred prior to the index admission was found in 17.5% of the cancer inpatients and 6.3% of the non-cancer inpatients. For both groups, the discussion of ACP resulted in shorter length of hospital stay, lower total costs of care, and lower rates of performing invasive procedures such as endotracheal intubation, CPR, central venous catheter insertion, and dialysis (Table 3, 4). The total costs of treatment during the last admission for the cancer patients with and without ACP documentation were USD 1,132 and USD 3,403, respectively. As to the non-cancer patients, the total costs of care were USD 1,309 with ACP documentation, and USD 3,556 without ACP documentation (Table 3, 4).

Discussion

The present study elected to focus on older patients with advanced chronic diseases who appeared to be appropriate for palliative care and for whom ACP should be initiated, either by the patients themselves or at the suggestion of their treating physicians. Several studies conducted in various countries and cultures have demonstrated the benefits of ACP for reducing healthcare utilization[15-17]. In the current study, ACP for patients in both the cancer and the non-cancer groups was undertaken at rates that were lower than those reported in other countries[15,18]. In detail, the present study established that ACP had been documented for 60% of the cancer patients, whereas studies in other countries have reported higher rates (75% to 96%)[15,18]. As to the non-cancer patients, the level of ACP documentation in the current study was 35.7%, which was noticeably lower than the 57% to 85% found in other countries[15,18]. The lower rate for the non-cancer patients is not surprising given that firstly, the prognosis for non-cancer diseases is relatively

Table 3. Health care utilization by cancer patients with and without ACP documentation

	Cancer (n=279), n (%)		p-value
	ACP (n=169)	No ACP (n=110)	
LOS (days), Median (min-max)	6 (1 to 187)	12 (1 to 263)	0.001
Invasive procedures			
ET intubation	19 (11.2)	87 (79.1)	<0.001
CPR	4 (2.4)	20 (18.2)	<0.001
Central lines	8 (4.7)	31 (28.2)	<0.001
Dialysis	3 (1.8)	13 (11.8)	<0.001
Tracheostomy	1 (0.6)	4 (3.6)	0.061
Cost per admission (USD per patient), Median (min-max)	1,132 (47 to 64,203)	3,403 (79 to 67,304)	<0.001

ACP=advance care planning; LOS=length of hospital stay; ET=endotracheal tube; CPR=cardiopulmonary resuscitation; USD= US dollar

Table 4. Health care utilization by non-cancer patients with and without ACP documentation

	Non-cancer (n=381), n (%)		p-value
	ACP (n=136)	No ACP (n=245)	
LOS (days), Median (min-max)	6 (1 to 403)	12 (1 to 802)	<0.001
Invasive procedures			<0.001
ET intubation	31 (22.8)	228 (93.1)	<0.001
CPR	2 (1.5)	63 (25.7)	<0.001
Central lines	21 (15.4)	85 (34.7)	0.010
Dialysis	20 (14.7)	64 (26.1)	<0.001
Tracheostomy	1 (0.7)	28 (11.4)	<0.001
Cost per admission (USD per patient), Median (min-max)	1,309 (70 to 93,635)	3,556 (82 to 107,692)	<0.001

ACP=advance care planning; LOS=length of hospital stay; ET=endotracheal tube; CPR=cardiopulmonary resuscitation; USD= US dollar

unpredictable and secondly, the determination of the most appropriate time for palliative care is difficult to establish. Therefore, treating physicians might feel uncomfortable about raising the need for ACP. As to the cancer patients, although ACP occurred at a higher rate than that for the non-cancer patients, it was still unacceptably low compared with the international results. Ideally, all patients with advanced disease should have ACP and AD in place. The low rate of documented ACP found in the current study needs attention to raise the quality of palliative care.

Moreover, the study demonstrated that a higher proportion of invasive procedures had been performed on patients with advanced illnesses than the figure reported by a study undertaken in Hong Kong[15]. In particular, the present study found that the rate at which endotracheal intubation was performed was 10 times higher for the cancer group and 5 times higher for the non-cancer group than the corresponding figures reported by the Hong Kong study. This might be due to the fact that care setting of the present study differed from that of the Hong Kong study[15]. In our circumstances, the palliative care team is not routinely consulted for all advanced stage cancer patients partly due to limited resources and overwhelming hospital visits for patients and families. Moreover, services for non-cancerous palliative care patients has been very limited and practicing physicians in our setting might be unaware of that service. These might lead to lower rate of access to care and ideal ACP for patients deem appropriate for palliative care. Furthermore, a substantial portion of patients, particularly in the non-cancer group received seemingly futile invasive medical interventions despite having ACP discussed. This might be an eastern cultural issue where families and possibly physicians remained reluctant to refrain

from having those "life sustaining" procedures carried out. Practice in our hospital has been to discuss separately for different procedures and resulted in various patterns of care delivered.

In the present study, the patients passed away in the studied hospital. Documentation of ACP was associated with a lower rate of health care utilization by way of shorter length of hospital stay, reduced usage of invasive procedures, and lower healthcare costs for both the cancer and the non-cancer patients. The decreased hospital stays and incidences of invasive procedures could signify a shorter period of suffering for the older patients at the end of their life. The reduced costs of health care also represent a lessening of the financial burdens for the patients' families and society. Furthermore, the finding that ACP was associated with lower health care utilization highlights the crucial role of this process from the perspectives of both patients and society. This supports the view that ACP should be routinely practiced even if patients are at a very critical period during an acute illness.

Most ACP documentation in the study was performed by residents in internal medicine, all of whom had attended a compulsory workshop in palliative care during their training. The fact that ACP and AD documentation were not routinely undertaken in the target population despite the training given to the residents raises the issue of how to improve this crucial aspect of palliative care. Providing treating physicians with a routine checklist encompassing the relevant disease criteria and indicators for palliative care would enable patients who would benefit from ACP to be identified at the time of their admission. Another option is to promote the concept of treating physicians throughout Thailand routinely discussing ACP and the merits of setting AD with all older patients with advanced diseases for both cancer and non-cancer chronic diseases.

The present study is subject to the limitations of retrospective studies. Even though the patients' documents were reviewed comprehensively, the rate at which ACP had been documented might be lower than the rate at which the planning had actually been performed as some of it might have been carried out verbally. It is also possible that ACP could have been done at another hospital or healthcare setting. However, this is quite unlikely to have occurred in current practice in Thailand, given that ACP is mostly undertaken at those institutions taking care of the most critical illnesses. Moreover, the quality of the performed ACP was not assessed in terms of its success in improving the quality of care and reducing the level of suffering of patients toward the end-of-life period. As the ACP typically occurred very close to the time of death, it could be argued that the planning did not lead to less health care utilization. The counter view is that ACP necessitates patients with advanced disease, their families, and health care team members discussing and considering the full range of possible patient outcomes and treatment options. In turn, this should expedite the recognition by the patients and their family members of the futility of pursuing invasive procedures, resulting in earlier deaths and less health care utilization than otherwise. A further consideration is that it was not possible for the present study to reveal the characteristics of patients in the study for whom the ACP was undertaken compared to the ones without documented ACP. It could be argued that the patients for whom physicians decided to initiate ACP might have been more critically ill, and the ACP was an attempt to reach the do-not-resuscitate (DNR) order. Another limitation was in relation to the predictive property of the criteria for palliative care selected in the present study. It is difficult to ascertain that patients who met the proposed criteria would not receive any benefit from invasive procedures should they be performed. In order to reveal the predictive property of the criteria, it should be applied to all patients during the same period to see how many of them who met the criteria would survive from the admission. The better performance of this criteria for predicting the futility of invasive procedures, the more likely that physicians will embrace the criteria in their practice.

Conclusion

ACP was only undertaken for a small proportion of older patients in the advanced stages of their illnesses, especially in the case of non-cancer patients. In the present study, ACP was associated with a reduction in the incidence of futile interventions and health care costs for both the cancer and non-cancer groups. Therefore, implementing ACP at an optimal time as a routine practice for older patients with advanced disease, particularly for those without cancer, might improve their quality of care while curtailing the use of unnecessary procedures and lowering the costs of care.

What is already known on this topic?

Conducting ACP for patients with advanced disease is beneficial in terms of improving the quality of care and decreasing the usage of invasive

procedures during the end-of-life period. Studies from both eastern and western cultures have reported the usefulness of performing ACP for cancer and non-cancer patients. However, some research has reported that ACP is executed at a low rate, especially for non-cancer patients. In Thailand, there is limited information on the prevalence of ACP and its impact on healthcare utilization, especially at tertiary referral hospitals.

What this study adds?

The study determined the beneficial effects of ACP on healthcare utilization at a university hospital, which are decreases in the length of hospital stay, utilization of invasive procedures, and costs of care. However, in the case of non-cancer patients, ACP was carried out at a markedly lower rate than that for cancer patients. Therefore, conducting ACP in routine practice for all patients with advanced disease, particularly non-cancer patients, is a challenge for physicians.

Acknowledgement

The authors gratefully acknowledge Surasit Suratewat and Sutisa Pitiyarn for helping in data collection regarding ACP documentation and Kornkanok Supawaropas for assistance in proof reading.

Authors' contributions

Suraarunsumrit P: acquisition and interpretation of data, preparation of manuscript, and bibliographic search. Nopmaneejumruslers C: study concept, interpretation of data, and revision of manuscript. Srinonprasert V: study concept, interpretation of data, bibliographic search, and revision of manuscript.

Funding disclosure

The present study was funded by Siriraj Research Fund.

Conflicts of interest

The authors declare that there are no personal or professional conflicts of interests regarding any aspect of this study.

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