

Original Article

Combination of Initial Palliative Prognostic Index and Score Change Provides a Better Prognostic Value for Terminally Ill Cancer Patients: A Six-Year Observational Cohort Study

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Abstract

Context. The Palliative Prognostic Index (PPI) is among the most popular scores used to predict life expectancy in terminally ill patients worldwide. PPI assessed on the first day of palliative care might be inappropriate because the contribution from subsequent changes in a patient's condition are not taken into account.

Objectives. The aim of this study is to determine the utility of sequential PPI assessments as a better prognostic tool for patients with terminal cancer.

Methods. In total, 2392 terminally ill cancer patients with initial and one-week PPI assessments under the palliative care consultation service between January 2006 and December 2011 at a single medical center in Taiwan were selected. Patients were categorized into initial PPI, Week 1 PPI, score change (initial PPI – Week 1 PPI; Δ score), and combined initial PPI and Δ score subgroups for survival analysis.

Results. Overall median survival was 32 days (range eight to 180 days), and 2183 patients (91.3%) died within 180 days of palliative care consultation service care. A significant difference in survival was observed among patient subgroups ($P < 0.001$). Subgroup survival analysis showed significant difference in patients with Δ scores >0 , 0 , and <0 in each prognostic group categorized by initial PPI. The c-statistic for predicting life expectancy <30 days was significantly higher with the combined initial PPI and Δ score (c-statistic, 0.71; 95% CI, 0.694–0.731) than with the initial PPI (c-statistic, 0.63; 95% CI, 0.61–0.65), Week 1 PPI

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(c-statistic, 0.67; 95% CI, 0.652–0.690), or Δ score (c-statistic, 0.64; 95% CI, 0.62–0.66).

Conclusion. Combination of initial PPI and score change is more useful than initial PPI for identifying patients with poor outcomes in good prognostic groups and patients with better outcomes in poor prognostic groups. *J Pain Symptom Manage* 2014;48:804–814. © 2014 American Academy of Hospice and Palliative Medicine. Published by Elsevier Inc. All rights reserved.

Key Words

Palliative Prognostic Index, prognostication, life expectancy, terminal cancer

Introduction

Prediction of life expectancy in terminally ill cancer patients is an important end-of-life care issue.^{1,2} The accurate prognostication of terminally ill cancer patients helps medical personnel to discuss end-of-life issues with patients and families and provide appropriate end-of-life care.³ Awareness of the estimated life expectancy helps patients to prepare for death and select end-of-life care and the place of death.^{4–6} Awareness of a patient's life expectancy is also important for families and caregivers for completing the patient's wishes, respecting the patient's autonomy, and accompanying the patient at his/her death bed.⁷

A clinical prediction of survival (CPS), defined as a clinical prognostic judgment made according to the clinician's subjective assessment of an individual patient, is generally a useful tool for predicting life expectancy in terminally ill patients; however, the accuracy of CPS depends on the clinician's experience and training in end-of-life care.⁸ Other studies reported that CPS was unreliable and inaccurate even in well-trained clinicians.^{9,10} In contrast to CPS, the Palliative Prognostic Index (PPI) scores the presenting clinical features (Palliative Performance Scale [PPS], dyspnea, oral intake, edema, and delirium).¹¹ PPI is a very popular score that is used worldwide to predict the life expectancies of terminally ill patients, and palliative care medical personnel can use PPI as a prognostic tool in the absence of subjective clinical predictions and laboratory examinations.^{12–14} However, a prospective study of 205 cancer patients in a palliative ward setting reported that PPI could not differentiate the survival durations of patients in good and intermediate prognostic groups.¹⁵ Our previous study validated PPI as a reliable prognostic score for 623 cancer patients in a

palliative care consultation setting in Taiwan.¹⁶ However, our previous study showed that PPI was overpessimistic when predicting survival durations of less than three weeks and over-optimistic when predicting longer survival durations.

PPI is commonly used as a prognostic tool when a patient enters palliative care. Prognostic estimates from the initial PPI score might be inappropriate because this time point might not represent the patient's most stable condition and ignores the influence of subsequent changes in the patient's condition. Ontario's cancer system reported that cancer decedents' functional statuses declined slowly during the six months before death.¹⁷ The core components of PPI, including performance status, dyspnea, drowsiness, and lack of appetite, particularly increased in severity during the last month of life. Because the patient's condition is dynamic and can deteriorate with the natural disease course or transiently improve after proper medical care, the patient's PPI can simultaneously change; therefore, the utility of the initial PPI for the prognostication of terminally ill patients is limited. Use of the change in PPI trajectory between two time points could provide the solution with which to overcome the shortcomings of initial PPI. Three studies recently addressed the prognostic value of performance score changes in terminally ill patients under palliative care.^{18–20} Downing et al.¹⁸ reported that a greater incremental change in PPS after palliative care unit admission was associated with a shorter survival probability. Chan et al.¹⁹ reported that the magnitude of PPS change between two time points improved the scale's prognostic usefulness for patients who were referred to palliative care services. Arai et al.²⁰ reported that the PPI

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