Original Article

Validation of the Simplified Palliative Prognostic Index Using a Single Item From the Communication Capacity Scale

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Abstract

Context. Although the Palliative Prognostic Index (PPI) is a reliable and validated tool to predict the survival of terminally ill cancer patients, all clinicians cannot always precisely diagnose delirium.

Objectives. The primary aim of this study was to examine the predictive value of a simplified PPI. In the simplified PPI, a single item from the Communication Capacity Scale was substituted for the delirium item of the original.

Methods. This multicenter prospective cohort study was conducted in Japan from September 2012 through April 2014 and involved 16 palliative care units, 19 hospital-based palliative care teams, and 23 home-based palliative care services. Palliative care physicians recorded clinical variables at the first assessment and followed up patients six months later.

Results. A total of 2425 subjects were recruited; 2343 had analyzable data. The C-statistics of the original and simplified PPIs were 0.801 and 0.800 for three week and 0.800 and 0.781 for six-week survival predictions, respectively. The sensitivity and specificity for survival predictions using the simplified PPI were 72.9% and 67.6% (for three week) and 80.3% and 61.8% (for six week), respectively.

Conclusion. The simplified PPI showed essentially the same predictive value as the original PPI and is an alternative when clinicians have difficulties in diagnosing delirium. J Pain Symptom Manage 2015;50:542–547.

Key Words

Palliative Prognostic Index, Communication Capacity Scale, delirium

Introduction

The Palliative Prognostic Index (PPI) is a reliable and validated tool to predict the survival of terminally ill cancer patients.[1–3] Because the PPI does not require blood tests or radiological evaluation, it can be useful in patients with cancer across all settings. Delirium, one component of the PPI, based on the *Diagnostic and Statistical Manual of Mental Disorders, fourth edition*, is,

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however, often underdiagnosed or misdiagnosed,[4–6] especially in cancer patients.[7] In addition, in PPI ratings, clinicians are required to exclude delirium caused by a single medication. Thus, assessment of delirium for PPI rating may be difficult for some physicians, nurses, and other health care providers.

The Communication Capacity Scale (CCS)[8] was designed to assess the ability to communicate with others, that is, to comprehend one's circumstances and express one's intentions appropriately. We hypothesized that the CCS could be a substitute for delirium in PPI ratings.

In this study, we compared the prognostic values of the original PPI and a simplified PPI in which delirium was replaced with one item from the CCS in patients with advanced cancer.

Methods

This was part of a larger study comparing the prognostic values of multiple prognostic tools including the PPI in hospital-based palliative care teams, palliative care units, and home-based palliative care services.[9] This multicenter, prospective, cohort study was conducted in Japan from September 2012 through April 2014 and involved 58 palliative care settings. The participating units included 16 palliative care units, 19 hospital-based palliative care teams, and 23 home-based palliative care services. The palliative care physicians evaluated the patients on the initial referral to each service and followed them up until death or six months after enrollment.

This study was conducted in accordance with the ethical standards of the Helsinki Declaration and ethical guidelines for epidemiologic research presented by the Ministry of Health, Labour and Welfare of Japan. Local institutional review boards of all participating institutions approved this study.

Patients

Eligible patients were consecutively enrolled in the study if they had been newly referred to the participating institutions during the study period. Each institution was asked to evaluate and collect data on a specific number of patients, such as 20, 40, 60, 80, or 100, based on its size.

Patients were included in the study if they were adults diagnosed with locally extensive or metastatic cancer (including hematological neoplasms) and had been admitted to palliative care units, were receiving care from hospital-based palliative care teams, or were receiving home-based palliative care services.

Measurements

We obtained data to formulate the PPI score, that is, Palliative Performance Scale (categorized into three groups: 10–20, 30–50, and 60 or more), oral intake (severely reduced, moderately reduced, or absent), edema (present or absent), dyspnea at rest (present or absent), and delirium (present or absent). Delirium was diagnosed according to the *Diagnostic and Statistical Manual of Mental Disorders, fourth edition* and regarded as absent when caused by a single medication.

In addition, to calculate the simplified PPI, we measured the communication capacity of patients using Item 4 of the CCS. The CCS is a five-item observer-rated scale to quantify a patient's communication capacity, with high internal consistency (Cronbach's alpha = 0.91) and a single-factor structure. Previous studies successfully used single items of the CCS,[10] and we decided to use Item 4 for this study. Item 4 was used to evaluate the content of voluntary conversation by a patient during an interview, and the responses were categorized into four levels: Level 0, explicit and complex communication; Level 1, explicit but simple communication; Level 2, slightly incoherent, or meaningful communication only when stimulated; Level 3, incoherent, or not verbally responsive even when stimulated.[8]

We also recorded the demographic and clinical characteristics of the study participants, including age, sex, site of primary cancer and metastatic disease, and anticancer treatment (i.e., chemotherapy, hormone therapy, and radiotherapy).

Statistical Analysis

We initially calculated the original PPI scores. To formulate the simplified PPI scores, we used the Palliative Performance Scale, oral intake, edema, and dyspnea at rest scores and replaced delirium with Item 4 of the CCS. We then constructed two types of binary variable: cutoff of 0/123 and 01/23 based on Item 4. In the former, for a patient with a CCS score of ≥1, delirium was classed as present. In the latter, for a patient with a CCS score of ≥2, delirium was classed as present. We examined the diagnostic value of the two types of binary variable based on Item 4 of the CCS and delirium.

To explore the association between the PPI score and survival, the survival curves were compared among the original PPI and the simplified PPI scores with different groups: Group A (0–2 points), Group B (2.1–4 points), and Group C (4.1–15 points). We had determined the three prognostic groups based on the original development of the PPI.[11]

We calculated C-statistics of the original PPI for three- and six-week survival, and of the simplified PPI with a cutoff of 0/123 for CCS Item 4, and simplified PPI with a cutoff of 01/23 for CCS Item 4. The C-statistics of the original and simplified PPIs were compared using Delong's method.[12]