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Palliative profile, one-year mortality and quality of life in older inpatients according to Be-PICT: a multicenter prospective cohort study

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ABSTRACT

Background: A palliative care approach (PCA), including advanced care planning (ACP), should be considered for patients with limited life expectancy. The Belgian Palliative Care Indicators Tool (Be-PICT) has been released to help identify patients who may benefit from such approach. This study aimed at measuring 1-year mortality and describe the quality of life in older inpatients, according to baseline Be-PICT results.

Methods: Prospective multicentre cohort study in older patients (≥ 75 years) admitted at geriatrics and cardiology wards of four Belgian hospitals. The palliative profile was defined as a positive Be-PICT.1, defined by the presence of its three criteria, i.e. a negative physician's answer to the surprise question 'would you be surprised if this patient dies in the 6–12 next months?', ≥ 1 poor health indicator and ≥ 1 life-limiting condition.

Results: Of the 379 patients (50% aged ≥ 85 years; 51% female), 52 (14%) presented a palliative profile and 83 (23%) died within 1 year. Be-PICT.1 showed the following characteristics to predict 1-year mortality: sensitivity 0.54, specificity 0.83, positive and negative predictive values 0.48 and 0.86, positive and negative likelihood ratios 3.22 and 0.55. The patients with a palliative profile were at higher mortality risk (hazard ratio 4.79 $p < 0.001$) and 1-year mortality rate (45%). Not using the SQ allowed to improve sensitivity to include a larger number of patients who may benefit from ACP and PCA.

Conclusions: Be-PICT.1 is a simple case-finding tool to identify older inpatients being at high mortality risk and candidates for ACP and PCA.

KEYWORDS

Prognosis; 1-year mortality; older person; advance care planning; palliative care

Background

Identifying older people with multiple comorbidity at risk of dying is important in order to adjust adequately the intensity of the treatment in line with the patient's goals and preferences. Moreover, timely palliative care can improve the quality of life and the satisfaction of the patients and their relatives [1–5]. However, progressive medical illnesses have typically unpredictable pathways [1–4]. Discussion about end-of-life care and patients' wishes is therefore often delayed, and palliative care is often offered late in the course of, in particular, non-cancerous diseases [6–9].

The Palliative Care Indicators Tool was designed in Belgium (Be-PICT) to identify patients who are candidates for palliative care and to expand access to palliative care resources also to persons who are suffering from non-cancerous diseases, in all settings [10,11]. A second aim of the tool is to allocate resources commensurate with the complexity of the situation and needs. Be-PICT was built based on a previous palliative tool, a palliative expert panel

and focus groups (see Method). Face validity and usefulness were tested among a panel of physicians from different disciplines, treating for patients suffering from various pathologies. Correlation with the palliative profile as defined by KCE, a semi-governmental institution, and the Belgian social security institution (INAMI-RIZIV) was also tested. The Be-PICT ability to predict mortality has, however, not yet been prospectively tested in older population. In addition to the essential concerns about the quality of life, this prognostication remains to be of high importance to guide end of life-related medical decision-making [12].

The aim of this study was to assess the Be-PICT accuracy for prediction of the 1-year mortality and low quality of life among older patients ≥ 75 years admitted to geriatric acute wards and cardiology wards of four hospitals in Belgium. As mentioned, the quality of life is a major concern of the palliative care approach, placing it as an important patient-centered outcome.

Methods

Study design and patient population

This study is a secondary analysis based on a multi-center prospective cohort conducted in the geriatric and cardiology wards of four Belgian hospitals. These medical departments were chosen as they frequently care for older patients, some of them having limited life expectancy. Indeed, the Belgian care program for older patients recommends that the most frail of them should preferably be admitted to a geriatric ward [13]. Moreover, cardiovascular disease is one of the most prevalent comorbidities in older people and one of the main reasons for hospital admission in this population, making cardiology wards an important place for hospital admission of older patients [14]. Inclusion criteria were age ≥ 75 years and admission to one of these wards from January to July 2018. Patients were excluded if they had very short hospital stay (< 2 days), were transferred from another department more than 2 days after their hospital admission, were

dying at the time of admission, or if the physician did not answer to the Be-PICT surprise question (Figure 1). A patient could be included only once in this study.

Data collection

Standardized interviews were conducted with the patients, using validated instruments. The baseline functional status 2 weeks prior to admission in the activities of daily living (ADL) was assessed using the Katz index (scale of dependence: 6–24) [15] and the Lawton index (scale of independence: 0–7) [16]. The patient's medical records were abstracted to collect their socio-demographic data and comorbidities, and to compute the Charlson Comorbidity Index (CCI) [17].

Endpoint variables

The main endpoint was the 1-year mortality. It was ascertained by phone call to the patients and/or their relatives. The secondary endpoint was the self-

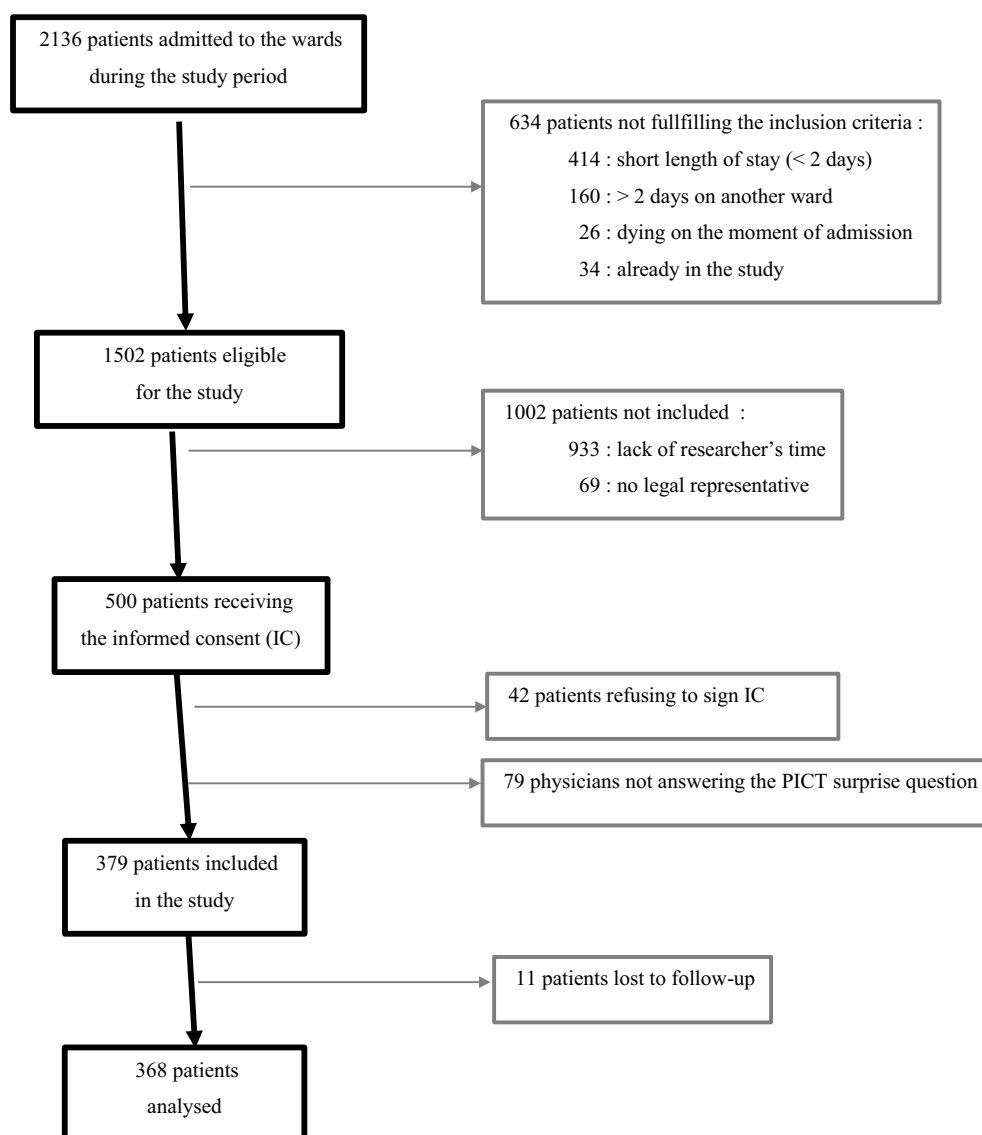


Figure 1. Flowchart of patient selection.

assessed health-related quality of life according to the items of EQ-6D-3 L, an extension of the EQ-5D-3 L that includes a cognitive dimension, at 1-year follow-up among the 1-year survivors [18]. The other five dimensions assess mobility, self-care, usual activities, pain and discomfort, anxiety and depression. All are three-level dimensions: no problems, some problems, and extreme problems.

Palliative indicator care tool (PICT)

PICT [10] has been designed in Belgium during a project launched by the National Public Health Administration aimed at helping identify the patients who might benefit from palliative care. This Belgian PICT (Be-PICT) is based on general indicators of poor health and clinical indicators of life-limiting conditions of the Supportive and Palliative Care Indicators Tool (SPICT) [19], as well as on the surprise question (SQ). Among the notable differences, Be-PICT contains more criteria related to the patient frailty in the general indicators. Dutch and French versions of the Be-PICT are available on most of the websites of the Belgian palliative care federations and at the weblink given in reference 10. Be-PICT is originally considered positive in the presence of a negative answer by the physician to the surprise question *'would you be surprised if this patient dies in the 6–12 next months ?'*, at least two general indicator of patient's poor health, and at least one clinical indicator of life-limiting condition (Be-PICT.2). A positive Be-PICT indicates a palliative profile, i.e. the need for further discussion of the goals of care and a palliative approach with a patient or his/her relative.

As suggested by De Bock et al. for SPICT [20], we also assessed a cut-off where at least one general indicator of patient's poor health was present (Be-PICT.1). As the SPICT tool originally also included the SQ in its tool but left it out in later versions (2015 and after), we also studied prognostic values of Be-PICT.1 and Be-PICT.2 with and without adding the SQ as a filter.

In the present paper, we have thus used two cut-off values of Be-PICT, namely Be-PICT.2, which is the originally designed tool, and Be-PICT.1; they both include the SQ step. We have systematically mentioned when Be-PICT was used without the SQ.

The surprise question (SQ) was addressed by the researchers to the hospital physician in charge of the patient. The researchers collected in the patient's medical record the presence of general indicators of patient's poor health and the clinical indicators of life-limiting condition. They also assessed the palliative care needs based on the Be-PICT general indicators, and the health-related quality of life measured by EQ-6D-3 L, asking the patient or their family to think about

the situation 2 weeks before admittance. Researchers were blinded to the treating physicians and nurses in order to not influence the management of the patients and the answer to the SQ.

Statistical analysis

The analysis was planned in the 379 patients with full Be-PICT data, i.e. the physician's answer to the surprise question and the assessment of indicators of poor health and of life-limiting conditions. The 11 patients (2.9%) lost to follow-up were not analyzed, leaving 368 patients for the analyses.

Continuous variables were described using medians and its interquartile range, whereas categorical variables were described using the number of percentages. A Wilcoxon Rank test was used to compare continuous data between two groups, and Pearson's Chi-Squared test, Pearson's Chi-Squared test with Yates continuity correction, or Fisher's Exact test were used to compare categorical variables between two groups following the test validity requirement.

The Be-PICT prognostic value was assessed through the evaluation of the following test characteristics: sensitivity, specificity, c-statistics, predictive values, and likelihood ratios. These characteristics were assessed for both the Be-PICT.2 (original cut-off) and Be-PICT.1, both with and without the use of the SQ.

A multivariable Cox's proportional hazards regression was used to assess the association between the two Be-PICT thresholds with 1-year mortality, adjusting for the patient's age, gender, as well as for the hospital and the ward.

Statistical analyses were performed using R statistical software version 4.0.2. A p-value <0.05 was considered statistically significant.

Ethics

The study was approved by all four local ethics committees (Belgian Registration number B67020 1734355). Informed consent was obtained from the patient or legal representative in case of cognitive impairment

Results

Population characteristics and 1-year mortality

Figure 1 details the inclusion process. The characteristics of the 379 patients are summarized in Table 1. Fifty percent of patients were aged ≥85 years, 51.5% were female, and 90.2% were community-dwelling. Two weeks before admission, the median Katz score was of 8 [6; 11] (dependence scale: 6–24), while EQ-6D identified many patients with problems related to usual activities (67.5%),

Table 1. Patient's characteristics and 1-year mortality rate (n = 379)).

	Total, n = 379 n (%) or median [P ₂₅ ;P ₇₅]	GU, n = 190 n (%) or median [P ₂₅ ;P ₇₅]	CU, n = 189 n (%) or median [P ₂₅ ;P ₇₅]	p-value
Socio-demographics				
Female	195 (51.5)	113 (59.5)	82 (43.4)	0.002
Age, in years				<0.001
75–79	74 (19.5)	18 (9.5)	56 (29.6)	
80–84	117 (30.9)	64 (33.7)	53 (28.0)	
85–89	116 (30.6)	62 (32.6)	54 (28.6)	
≥90	72 (19.0)	46 (24.2)	26 (13.8)	
Patients admitted from				0.004
Home	342 (90.2)	162 (85.3)	180 (95.2)	
Nursing home	27 (7.1)	21 (11.1)	6 (3.2)	
Short term stay	10 (2.6)	7 (3.7)	3 (1.6)	
Functional (2 weeks before admission)				
ADL dependence: Katz score (8–24)	8 [6; 11]	9 [7; 13]	7 [6; 9]	<0.001
iADL independence (0–7)	3 [1; 5]	3 [1; 4]	5 [3; 6]	<0.001
EQ-6D-3 L				
Mobility				0.06
no problem	143 (37.7)	62 (32.6)	81 (42.9)	
some problems	223 (58.8)	119 (62.6)	104 (55.0)	
unable	13 (3.4)	9 (4.7)	4 (2.1)	
Selfcare				<0.001
no problem	192 (50.7)	66 (34.7)	126 (66.7)	
some problems	145 (38.3)	90 (47.4)	55 (29.1)	
unable	42 (11.1)	34 (17.9)	8 (4.2)	
Usual activities				<0.001
no problem	123 (32.5)	43 (22.6)	80 (42.3)	
some problems	174 (45.9)	90 (47.4)	84 (44.4)	
unable	82 (21.6)	57 (30)	25 (13.2)	
Pain				0.40
no	174 (45.9)	89 (46.8)	85 (45.0)	
moderate	177 (46.7)	84 (44.2)	93 (49.2)	
extreme	28 (7.4)	17 (8.9)	11 (5.8)	
Anxiety or depression				0.10
no	237 (62.5)	112 (58.9)	125 (66.1)	
moderate	124 (32.7)	65 (34.2)	59 (31.2)	
extreme	18 (4.7)	13 (6.8)	5 (2.6)	
Cognitive				0.003
no problem	196 (51.7)	88 (46.3)	108 (57.1)	
some problems	167 (44.1)	88 (46.3)	79 (41.8)	
unable	16 (4.2)	14 (7.4)	2 (1.1)	
Comorbidity upon admission				
Charlson comorbidity index	7 [5;9]	7 [5;9]	7 [5;8]	0.03
Vital status at 1 year				
dead	83 (21.9)	46 (24.2)	37 (19.6)	0.54
alive	285 (75.2)	139 (73.2)	146 (77.2)	
lost to follow-up	11 (2.9)	5 (2.6)	6 (3.2)	

GU: geriatric units; CU: cardiology units

EQ-6D-3 L: EuroQol, 6 dimensions;

bADL: basic activities of daily life; iADL: instrumental activities of daily living

mobility (62.2%), pain (54.1%), selfcare (49.4%), cognition (48.3%) and anxiety/depression (37.4%). Upon admission, the median Charlson comorbidity index was 7 [IQR: 5; 9]. Patients in cardiology units (CU), as compared to those in geriatric units (GU), were more often males, <80 years of age, community-living, functionally independent and cognitively well (Table 1). The overall 1-year mortality rate was 22.6% (n = 83/368), which was similar between CU and GU (20.2% vs. 24.9%, p = 0.286).

Be-PICT criteria and palliative profile

To the surprise question (SQ), physicians answered 'no, I would not be surprised if this patient dies in the 6–12 next months' for 129 of the 379 patients (34.0%), a figure similar in CU and GU (33.3% vs. 34.7%, p = 0.773).

These 129 patients, as compared to the 250 other ones, were more often aged ≥80 years (88.4 vs. 76.4%; p = 0.006) and nursing home residents (13.2 vs. 4.0%, p < 0.001). They had higher median scores of functional dependence (median Katz score: 8.5 vs. 7.0) and comorbidity (median CCI: 8.0 vs. 6.0) [21].

Of the seven general indicators of poor/deteriorating health, ≥2 general indicators were observed in 50% of the patients (GU 58% vs. CU 42%, p = 0.002), while ≥1 general indicator was present in 81% of the patients (GU 85% vs. CU 76%, p = 0.03). Of the twenty-two clinical indicators of life-limiting condition, at least one indicator was present in 38% of the patients (GU 41% vs. CU 35%; p = 0.26).

According to Be-PICT.2 (original cut-off), the palliative profile was present in 9.5% of the patients and was similar to the CU and GU (10% vs. 9%, p = 0.71). Using

Table 2. Be-PICT prognostic accuracy at usual threshold (Be-PICT.2) and lower threshold (Be-PICT.1), using or not the Surprise Question (SQ) (N = 368).

	Total (N = 368)
Sensitivity [95%CI]	
Be-PICT.2	0.386 [0.281; 0.499]
Be-PICT.2 without SQ	0.542 [0.429; 0.652]
Be-PICT.1	0.542 [0.429; 0.652]
Be-PICT.1 without SQ	0.747 [0.640; 0.836]
Specificity [95%CI]	
Be-PICT.2	0.863 [0.818; 0.901]
Be-PICT.2 without SQ	0.688 [0.630; 0.741]
Be-PICT.1	0.832 [0.783; 0.873]
Be-PICT.1 without SQ	0.533 [0.474; 0.592]
PPV [95%CI]	
Be-PICT.2	0.451 [0.332; 0.573]
Be-PICT.2 without SQ	0.336 [0.257; 0.422]
Be-PICT.1	0.484 [0.379; 0.590]
Be-PICT.1 without SQ	0.318 [0.253; 0.388]
NPV [95%CI]	
Be-PICT.2	0.828 [0.780; 0.869]
Be-PICT.2 without SQ	0.838 [0.784; 0.882]
Be-PICT.1	0.862 [0.815; 0.900]
Be-PICT.1 without SQ	0.879 [0.820; 0.923]
PLR [95%CI]	
Be-PICT.2	2.82 [1.89; 4.20]
Be-PICT.2 without SQ	1.74 [1.34; 2.26]
Be-PICT.1	3.22 [2.33; 4.46]
Be-PICT.1 without SQ	1.60 [1.34; 1.91]
NLR [95%CI]	
Be-PICT.2	0.71 [0.60; 0.85]
Be-PICT.2 without SQ	0.67 [0.52; 0.85]
Be-PICT.1	0.55 [0.43; 0.70]
Be-PICT.1 without SQ	0.47 [0.32; 0.70]
AUC [95%CI]	
Be-PICT.2	0.624 [0.568; 0.681]
Be-PICT.2 without SQ	0.615 [0.555; 0.675]
Be-PICT.1	0.687 [0.629; 0.745]
Be-PICT.1 without SQ	0.640 [0.584; 0.695]

95%CI: 95% Confidence Interval; PPV: positive predictive value; NPV: negative predictive value; PLR: positive likelihood ratio; NLR: negative likelihood ratio; AUC: Area Under the Receiver Operating Characteristic (ROC) curve

Be-PICT.1, the palliative profile was present in 14% of the patients, and identical in CU and GU (14% vs. 14%, $p = 0.98$). The palliative profile was, respectively, present in 27% (Be-PICT.2) and 36% (Be-PICT.1) of the patients when the SQ was not used.

Prognostic accuracy of Be-PICT and variants

Table 2 shows the characteristics of Be-PICT at different threshold (Be-PICT.1 and Be-PICT.2), with and without the use of the SQ. These characteristics include sensitivity, specificity, positive and negative predictive values (PPV and NPV), positive and negative likelihood ratios (PLR and NLR).

The original Be-PICT, i.e. Be-PICT.2 that use the SQ, showed high specificity (0.86) but low sensitivity (0.39), associated with moderate PPV (0.45) and high NPV (0.83). Its informative value was moderate for a positive test (PLR 2.8) and weak for a negative test (NLR 0.7). The Be-PICT.2 c-statistic was 0.62 [95%CI: 0.57;0.68].

Using a lower threshold, i.e. Be-PICT.1, showed a similar high specificity (0.83) but a better sensitivity (0.54) as compared to Be-PICT.2, associated with low

PPV (0.48) and high NPV (0.86). Its informative value was also moderate for a positive test (PLR 3.2) and low for a negative test (NLR 0.55). The Be-PICT.1 c-statistic was 0.69 [95%CI: 0.63;0.74].

As shown in Table 2, if the surprise question (SQ) is not used, specificity decreases and sensitivity increases for both threshold of Be-PICT, leading to similar NPV and NLR and lower PPV and PLR.

Endpoints at 1 year

Survival was significantly lower ($p < 0.001$) in patients positive for Be-PICT.1 (Figure 2(a)) or for Be-PICT.2 (Figure 2(b)), as compared to patients with a negative test. The use of the SQ provided higher hazard ratios for both Be-PICT.2 and Be-PICT.1 than when not using it (Table 3). Be-PICT.1 that use the SQ showed the best discrimination following area under the receiver operating characteristics (ROC) curves. In multivariable analysis adjusted for age, gender, medical unit and hospital, positive Be-PICT.2 and Be-PICT.1 were, respectively, associated with mortality with an hazard ratio of 3.55 [95%CI: 2.22; 5.67] ($p < 0.001$) and 4.79 [95%CI: 3.01;7.63] ($p < 0.001$) (Table 3).

Table 4 summarises the items of EQ-6D-3 L 1-year after discharge among the survivors, based on the Be-PICT. Patients identified as 'palliative' were more likely to have poor 1-year EQ-6D-3 L indicators than those not identified by Be-PICT that did not use the SQ.

Discussion

Main findings

In this cohort of patients admitted to acute geriatric and cardiology wards, using Be-PICT.1 allowed to identify older people with about 5-fold increase in hazard of death within 1 year after their hospital stay. Be-PICT. 2 allowed to improve slightly specificity while not using the SQ allowed a higher sensitivity. For patients alive at 12-month follow-up, using Be-PICT.1 without SQ could highlight important quality of life concerns that should be taken into account for further evaluation.

Comparison with other studies and potential explanation

In a recent review, El Mokhallalati et al. identified five tools to identify patients with poor prognosis (12-month mortality) in primary care that can be used in the hospital setting [22]. One of these tools, i.e. the Surprise Question (SQ), is used as part of some the other screening tools: the double SQ, the GSF PIG and the NECPAL. Overall, these tools showed a high NPV, while sensitivity and specificity varied widely, depending on population characteristics. In our

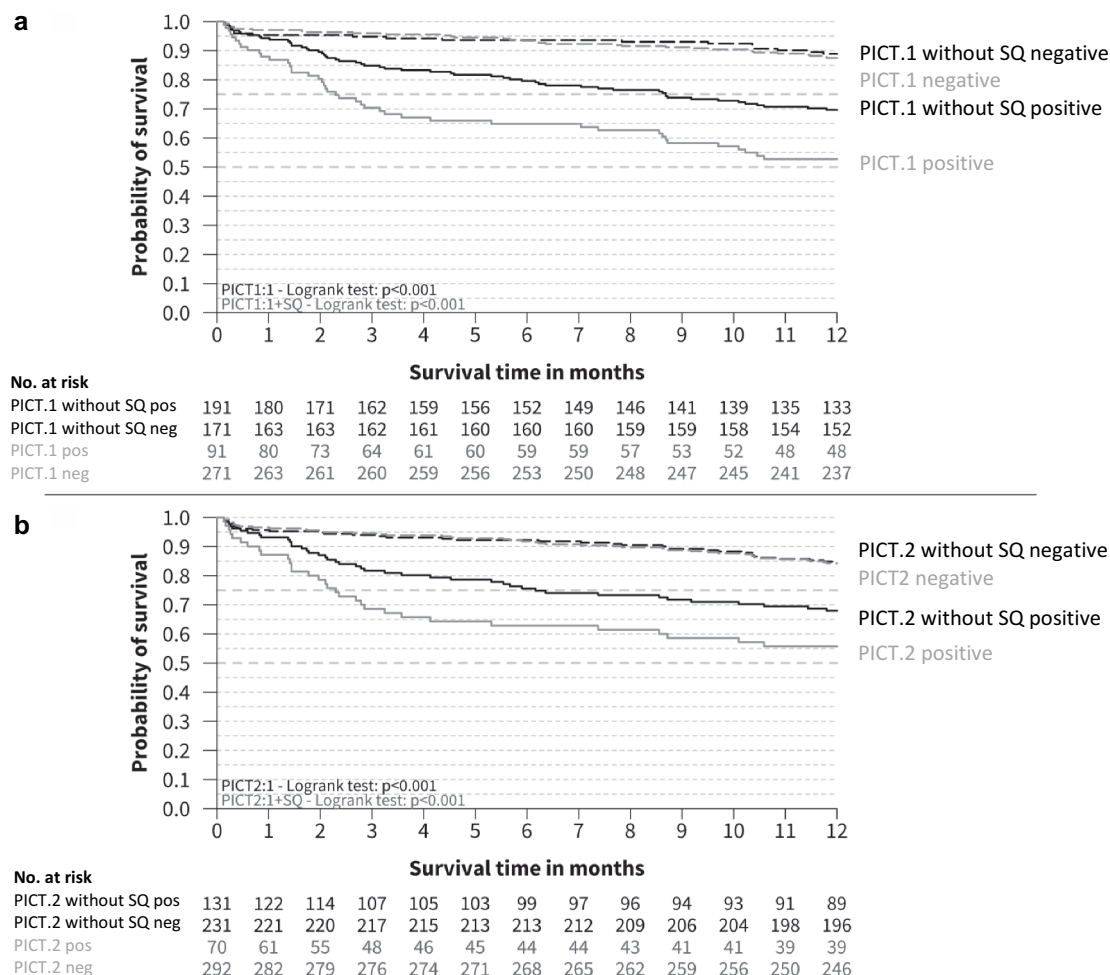


Figure 2. Kaplan–Meier survival curve according to Be-PICT.1 (Figure 2A) and to Be-PICT.2 (Figure 2B).

Table 3. Be-PICT at usual threshold (Be-PICT.2) and lower threshold (Be-PICT.1), using or not the Surprise Question (SQ), and 1-year mortality in multivariable Cox regression* (N = 362; without missing values for death date).

	HR (95%CI)	p-value
Be-PICT.2	3.55 (2.22; 5.67)	<0.001
Be-PICT.2 without SQ	2.41 (1.52; 3.84)	<0.001
Be-PICT.1	4.79 (3.01; 7.63)	<0.001
Be-PICT.1 without SQ	3.20 (1.87; 5.50)	<0.001

* the model was adjusted for age, gender, hospital and ward.

SQ: Surprise Question; HR: Hazard Ratio; 95%CI: 95% Confidence Interval

study, Be-PICT had similar accuracy than those previously reported for SPICT and NECPAL when used in the hospital setting [22,23], except for the sensitivity, which is lower in our study. Be-PICT was designed with the SQ filter to increase the specificity of the tool, but at the expense of sensitivity; if the aim is to offer a palliative approach to more people, without using the SQ with Be-PICT may improve its sensitivity. Note that the SQ was originally included in the SPICT, after being removed from more recent versions. Both SPICT and NECPAL have the best evidence of validity in multiple clinical settings and diseases [24]. Few other tools were in fact studied for mortality prognostication in a heterogeneous hospitalized older population

[25,26]: they mainly focussed on the frailty concept, sometimes through an extensive evaluation. Studies have shown that predicting mortality in non-cancer diseases may be less easier than for cancer ones [27]. The added value of the Be-PICT is that it questions also general indicators of deterioration, often complains and unmet needs of patients and/or their relatives; this could be a 'hook' to introduce discussion about end-of-life care. In our study, Be-PICT highlighted some important quality life concerns. These quality life issues were, however, highly prevalent; this raises the question of a more extensive evaluation of hospitalized older people, even in Be-PICT negative patients. These qualitative of life concerns are usual point of care for geriatric teams.

Be-PICT aims to objectively screen for patients at risk of dying or low quality of life and to initiate discussion about end-of-life concerns. Specificity and negative predictive value were high in our study, like the above-mentioned tools, to allow early discussion about wishes, but also to prompt a more holistic needs assessment without waiting last days or weeks of life. Be-PICT.1 has shown the best discrimination ability; when used without the SQ, sensitivity of Be-PICT.1

Table 4. Quality of life domains in the 280° patients alive at 1 year, with EQ-6D-3 L follow-up, according to the baseline Be-PICT at usual threshold (Be-PICT.2) and lower threshold (Be-PICT.1), using or not the Surprise Question (SQ).

Be-PICT.1		With the Surprise Question			Without the Surprise Question		
EQ-6D-3 L problems	Negative Be-PICT.1 (n = 242), n (%)	Positive Be-PICT.1 (n = 38), n (%)	p-value	Negative Be-PICT.1 (n = 205), n (%)	Positive Be-PICT.1 (n = 75), n (%)	p-value	
Mobility	148 (61)	28 (74)	0.14	118 (58)	58 (77)	<0.01	
Self-care	151 (62)	32 (84)	<0.01	121 (59)	62 (83)	<0.001	
Activities	190 (79)	32 (84)	0.42	155 (76)	67 (89)	0.012	
Pain	131 (54)*	23 (61)	0.48	107 (53)*	47 (63)	0.13	
Anxiety or depression	77 (32)*	12 (32)	0.96	66 (32)*	23 (31)	0.79	
Cognition	79 (33)**	13 (34)	0.88	66 (32)**	26 (35)	0.74	
Be-PICT.2		With the Surprise Question			Without the Surprise Question		
EQ-6D-3 L problems	Negative Be-PICT.2 (n = 257), n (%)	Positive Be-PICT.2 (n = 23), n (%)	p-value	Negative Be-PICT.2 (n = 227), n (%)	Positive Be-PICT.2 (n = 53), n (%)	p-value	
Mobility	158 (62)	18 (78)	0.11	131 (58)	45 (85)	<0.001	
Self-care	164 (64)	19 (83)	0.07	139 (61)	44 (83)	<0.01	
Activities	203 (79)	19 (83)	0.68	174 (77)	48 (91)	0.02	
Pain	140 (55)*	14 (61)	0.57	119 (53)*	35 (66)	0.08	
Anxiety or depression	83 (32)*	6 (26)	0.53	74 (33)*	15 (28)	0.53	
Cognition	85 (33)**	7 (30)	0.78	74 (33)**	18 (34)	0.88	

* 1 lacking data **2 lacking data ° 5 patients alive with all EQ 6D3L lacking data

increases, with an acceptable negative likelihood ratio, allowing the discussion to be extended to a larger patients panel. Be-PICT should, however, not be used for treatment limitation decision, without further evaluation and discussion with the patient and/or his/her relative. Prognosis is essential to inform clinical decision-making and discussion with the patients [12,28], but treatment limitation decision can also be made without considering life expectancy: patient may request for supportive and palliative care or treatment withdrawal, as mentioned in the general indicators section of the Be-PICT. It is, however, interesting to note that proactive demand for palliative care was hardly ever mentioned in our study. This may be related to the lack of knowledge and misconception about what is actually a palliative approach, pushing it to the very end of life.

Clinical implications

The aim of palliative care is to improve the quality of life of patients suffering from life-threatening illness, as well as their relatives. Belgian legislation describes palliative care (Law 21.07.2014) as: "the whole of the care provided to a patient who is in the advanced or terminal stages of a serious, progressive and life-threatening disease, regardless of his/her life expectancy". The law stipulates that any patient in these conditions has the right to palliative care, in which "A multidisciplinary package of care is guaranteed to support these patients at the physical, psychological, social, moral, existential and, where appropriate, spiritual levels. Palliative care offers the patient and his/her relatives the best possible quality of life and maximum independence". The palliative approach does not necessarily exclude disease-specific treatments: care is adapted to the needs of the patient, during complications, as well as improvements, until death. Typically, the

palliative care approach includes a concerted discussion between the patient, his/her relatives and the care providers about the patient's wishes and goals of care, including medical treatment: this process is known as advanced care planning. Be-PICT is the official tool mentioned in the Royal Decree (21.10.2018), establishing the criteria for identifying a palliative patient. The main objective of the Be-PICT is to extend the definition of a "palliative patient" to not terminally ill and non-cancerous conditions, in order to assess their wishes, their needs and allocate resources in proportion to the complexity of the situation. To this end, the clinicians will prefer a screening tool with a good sensitivity, even if low specificity means identifying patients who will not die within a year; the cost of false positive from this screening is minimal as it "only" encourages Advanced Care Planning discussion in seriously ill patients and assessment of their specific needs. On the other hand, too low specificity could expose to a "Goldilocks phenomenon" or pseudo-participation, as the choices made do not reflect those that would be desired when faced with the end of life [29,30]. The original Be-PICT, i.e. Be-PICT.2 that use the SQ, do not offer the best compromise between sensitivity and specificity. The authors recommend using a lower threshold, i.e. Be-PICT.1. In addition, the authors believe that it is appropriate not to use the SQ filter for the reasons mentioned above, when it comes to questioning wishes, goal of care and unmet care needs. This screening is a starting point for a discussion that involve regular reassessment, especially when patients' medical conditions change. Combining clinical estimate assessed by the SQ improves specificity, which is a parameter to be considered when resources and costs are at stake in a public health context. The consequent reduction in sensitivity, however, exposes to the risk of excluding patients

who could have benefited from a review of their goal of care and needs that would ideally take place in an usual practice.

Strengths and limits

Our prospective multicenter study included consecutive patients is the first, to the best of our knowledge, to assess the predictive ability of the Be-PICT to predict 1-year mortality after a GU or CU admission. Despite the design, inclusion rate was only one third, and we cannot exclude a selection bias. Our inclusion criteria may have excluded the most sickest and fittest OP, explaining the lack of discrimination of the tool. Moreover, Be-PICT was designed to early detect patients with palliative care needs. Therefore, mortality was probably not a sufficient outcome to take into account. Future research should include prognostication of adverse outcomes that may hamper quality of life, such as distressing symptoms.

Conclusions

Be-PICT is a simple and useful case-finding tool to identify older inpatients being at high mortality risk. This tool could be used to initiate discussion about end-of-life care and, moreover, to prompt comprehensive evaluation of OP specific needs.

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The authors confirm that they have participated sufficiently in the work to take public responsibility for appropriate portions of the content and the manuscript has been read and approved by all the named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. The order of authors listed in the manuscript has been approved by all the authors. RP and NVDN conceived and designed the study; IDB SH, HB and MDS-H were involved in recruitment and data collection; SH and IDB performed the data analysis; IDB drafted the manuscript; IDB, SH, HB, NVDN, MDS-H and RP helped in critical revision for important intellectual content; all authors were involved in final approval of the version to be published.

Ethics approval and consent to participate

This study was approved by the medical ethics committee with Belgian registration number B670201734351.

References

- [1] Detering KM, Hancock AD, Reade MC, et al. The impact of advance care planning on end of life care in elderly patients: randomised controlled trial. *BMJ*. 2010Mar;340:c1345.
- [2] Gaertner J, Siemens W, Meerpohl JJ, et al. Effect of specialist palliative care services on quality of life in adults with advanced incurable illness in hospital, hospice, or community settings: systematic review and meta-analysis. *BMJ*. 2017 Jul;357:j2925.
- [3] Kavalieratos D, Corbelli J, Zhang D, et al. Association between palliative care and patient and caregiver outcomes: a systematic review and meta-analysis. *JAMA*. 2016 Nov;316(20):2104–2114.
- [4] Kelley AS, Morrison RS, Campion EW. Palliative care for the seriously ill. *N Engl J Med*. 2015 Aug;373(8):747–755.
- [5] Brereton L, Clark J, Ingleton C, et al. What do we know about different models of providing palliative care? Findings from a systematic review of reviews. *Palliat Med*. 2017 Oct;31(9):781–797.
- [6] Traue DC, Ross JR. Palliative care in non-malignant diseases. *J R Soc Med*. 2005 Nov;98(11):503–506.
- [7] Chen M-L. Inequity of palliative care for non-cancer patients. *J Nurs Res*. 2019 Apr;27(2):1–2.
- [8] Stiel S, Heckel M, Seifert A, et al. Comparison of terminally ill cancer- vs. non-cancer patients in specialized palliative home care in Germany – a single service analysis. *BMC Palliat Care*. 2015 Jul;14(1):34.
- [9] Quinn KL, Wegier P, Stukel TA, et al. Comparison of palliative care delivery in the last year of life between adults with terminal noncancer illness or cancer. *JAMA Network Open*. 2021 Mar;4(3):e210677.
- [10] Desmedt, Marianne Claire Beguin, Laurence Habimana, Brigitte Massart, Luc Otte, Emilie Pontus, Paul Vanden Berghe, , Gert Huysmans Service Public Fédéral Santé Publique et la Cellule Fédérale d'évaluation des soins palliatifs. 'Identification du patient palliatif & attribution d'un statut lié à la sévérité des besoins: de l'usage d'un nouvel outil, le PICT. Vol. ; Apr 2016 187 . [cited 2022 Jan 25]. Available from <https://organesdeconcertation.sante>.

- belgique.be/fr/documents/identification-du-patient-palliatif-attribution-dun-statut-lie-la-severite-des-besoins-de
- [11] Marianne D. Identification du patient palliatif & attribution d'un statut lié à la sévérité des besoins: de l'usage d'un nouvel outil. le PICT. p. 187.
 - [12] Chu C, White N, Stone P. Prognostication in palliative care. *Clin Med (Lond)*. 2019 Jul;19(4):306–310.
 - [13] Baeyens JP. Belgian care programme for older patients. *J Nutr Health Aging*. 2010 Jun;14(6): 474–475.
 - [14] De Brauwier I, D'Hoore W, Swine C, et al. Changes in the clinical features of older patients admitted from the emergency department. *Arch Gerontol Geriatr*. 2014 Jul;59(1):175–180.
 - [15] Covinsky KE, Palmer RM, Counsell SR, et al. Functional status before hospitalization in acutely ill older adults: validity and clinical importance of retrospective reports. *J Am Geriatr Soc*. 2000 Feb;48(2):164–169.
 - [16] Lawton MP, Brody EM. Assessment of older people: self-maintaining and instrumental activities of daily living. *Gerontologist*. 1969;9(3):179–186.
 - [17] Charlson ME, Pompei P, Ales KL, et al. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. *J Chron Dis*. 1987 Jan;40(5):373–383.
 - [18] Soliman IW, de Lange DW, Peelen LM, et al. Single-center large-cohort study into quality of life in Dutch intensive care unit subgroups, 1 year after admission, using EuroQoL EQ-6D-3L. *J Crit Care*. 2015 Feb;30(1):181–186.
 - [19] Highet G, Crawford D, Murray SA, et al. Development and evaluation of the Supportive and palliative care indicators tool (SPICT): a mixed-methods study. *BMJ Support Palliat Care*. 2014 Sep;4(3):285–290. Art. no. 3.
 - [20] De Bock R, Van Den Noortgate N, Piers R. Validation of the supportive and palliative care indicators tool in a geriatric population. *J Palliat Med*. 2018 Feb;21(2):220–224. Art. no. 2.
 - [21] Maes H, Van Den Noortgate N, De Brauwier I, Velghe A, Desmedt M, De Saint-Hubert M, and Piers R. Prognostic value of the surprise question for one-year mortality in older patients: a prospective multicenter study in acute geriatric and cardiology units. *Acta Clin Belg*. 2020 Oct;1–9. DOI:10.1080/17843286.2020.1829869
 - [22] ElMokhallalati Y, Bradley SH, Chapman E, et al. Identification of patients with potential palliative care needs: a systematic review of screening tools in primary care. *Palliat Med*. 2020 Sep;34(8):989–1005.
 - [23] Piers R, De Brauwier I, Baeyens H, Velghe A, Hens L, Deschepper E, Henrard S, De Pauw M, Van Den Noortgate N, and De Saint-Hubert M. Supportive and palliative care indicators tool prognostic value in older hospitalised patients: a prospective multicentre study. *BMJ Support Palliat Care*. May 2021;:2021-003042. DOI:10.1136/bmjspcare-2021-003042. bmjspcare
 - [24] Remawi BN, Gadoud A, Murphy IMJ, et al. Palliative care needs-assessment and measurement tools used in patients with heart failure: a systematic mixed-studies review with narrative synthesis. *Heart Fail Rev*. 2021 Jan;26(1):137–155.
 - [25] Ritt M, Ritt JI, Sieber CC, et al. Comparing the predictive accuracy of frailty, comorbidity, and disability for mortality: a 1-year follow-up in patients hospitalized in geriatric wards. *Clin Interv Aging*. 2017 Feb;12:293–304.
 - [26] Pilotto A, Veronese N, Daragjati J, et al. Using the multidimensional prognostic index to predict clinical outcomes of hospitalized older Persons: a prospective, multicenter, international study. *J Gerontol A*. 2019 Sep;74(10):1643–1649.
 - [27] Murray SA, Kendall M, Boyd K, et al. Illness trajectories and palliative care. *BMJ*. 2005 Apr;330(7498):1007–1011.
 - [28] Gill TM. The central role of prognosis in clinical decision making. *JAMA*. 2012 Jan;307(2):199.
 - [29] Piers RD, van Eechoud IJ, Van Camp S, et al. Advance Care Planning in terminally ill and frail older persons. *Patient Educ Couns*. 2013 Mar;90(3):323–329. Art. no. 3
 - [30] Billings JA, Bernacki R. Strategic targeting of advance care planning interventions: the goldilocks phenomenon. *JAMA Intern Med*. 2014 Apr;174(4):620.