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Impact of Glasgow Prognostic Score on Advanced Cancer Patients in Palliative Care Settings: A Short Narrative Review

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Abstract

Advanced cancer patients gradually experience deterioration of their physical condition and symptoms. Prognostic information is quite important for patients, their caregivers and medical staff. The Glasgow Prognostic Score (GPS)/ modified GPS (mGPS) is one of the objective prognostic indicators. This study aimed to review the prevalence of GPS/ mGPS and its impact on the prognostic value, physical function, quality of life and symptoms, and cancer cachexia among cancer patients who had received supportive care without plan of any anti-tumor therapy. Six studies were identified. The increase in GPS/mGPS score was correlated with poor prognosis, poor performance status and weight loss in patients without anti-tumor therapy. However, no evidence about the correlation between GPS/mGPS and activities of daily living, quality of life and symptoms existed. More detailed classification of GPS/mGPS will be needed to adequately reflect the general conditions of advanced cancer patients who have received supportive care without plan of any anti-tumor therapy.

Keywords: Glasgow prognostic score; Palliative care; Cancer; Prognostic indicator

Introduction

Cancer is a leading cause of death in many countries. Most patients with advanced or recurrent cancer might receive anti-tumor therapy including chemotherapy, molecular target drugs, radiation therapy, and immunotherapy. Recently, guidelines recommend that supportive and palliative care should be provided from the start of anti-tumor therapy [1]. In the course of illness trajectory, they experience the deterioration of their condition and the importance of palliative care gradually increases. Prognostic information is quite important for patients themselves and their families to live their precious lives, and for medical staff to provide adequate care. The Glasgow Prognostic Score (GPS)/ modified GPS (mGPS), which requires measurements of C-reactive protein (CRP) and albumin, is one of the objective prognostic indicators [2]. GPS/mGPS is simple and easy to use for all medical staffs. Many researchers have reported the significance of GPS/ mGPS in cancer patients undergoing anti-tumor therapy [2]. However, research about the significance of GPS/mGPS in cancer patients who had received supportive care without plan of any anti-tumor therapy was quite limited. Herein, we perform a short narrative review about the impact of GPS/mGPS on the prevalence, prognostic value, physical function, quality of life (QOL) and symptoms, and cancer cachexia in cancer patients who have received supportive care without plan of any anti-tumor therapy.

Materials and Methods

"MEDLINE" and "Cochrane review" were systemically searched for publications with search terms including: "Glasgow Prognostic Scale" and "palliative Care", "palliative Medicine", "Terminal Care", "Supportive Care" and "Pain". Studies about advanced cancer patients who had received supportive care without plan of any anti-tumor therapy were included. If the details about these patients were described in the manuscripts, we enrolled the study. We focused on and performed narrative review about the prevalence, prognostic value, physical function, QOL and symptoms, and cancer cachexia.

Results

We identified 6 studies that met the criteria [3-8]. Table 1 shows these 6 studies and their details. Four studies were single-centre studies and the other two were multi-centre studies. Four studies were prospective studies and other two were retrospective studies. The subjects were outpatients in 1 study, inpatients in 2 studies, both inpatients and outpatients in 2 studies, and inpatients and lived in a home in 1 study. The study settings included outpatient clinics, general wards, palliative care units (PCUs), and home-palliative care services. The sample size ranged from 102 to 217 subjects in 4 studies and only one study included more than 1000 subjects. GPS and mGPS were used in 3 studies, respectively Table 1.

Prevalence of the GPS/mGPS scores

Six studies showed the prevalence of the GPS/mGPS scores (Table 1). The patients with GPS/mGPS score 2 ranged 20.4–70.9%, and patients with the GPS/mGPS score 0 ranged 6.9–70.4%. The prevalence of GPS/mGPS scores in three studies including outpatients was different from the four other studies. The study settings might be important for the investigation about GPS scores.

Prognostic value of GPS/mGPS

Four studies showed the prognostic value of GPS/mGPS (Table 1). The patients with higher GPS/mGPS scores showed shorter survival, compared to patients with lower GPS/mGPS scores. The hazard ratio in patients with GPS/mGPS score 2 was 1.36–2.71, compared to GPS/ mGPS score 03 [5-7]. The median survival time ranged 0.5–1.0 month among patients with GPS/mGPS score 24-6 is 8. On the other hand, the median survival time for patients with GPS/mGPS score 0 ranged from 58 days to 15.4 months is 4-6 [8]. One study showed that the 4-week and 2-week survival rates in patients with GPS/mGPS score 2 were lower or tended to be lower than among those with score 0–1, respectively

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Table 1: Details of the studies regarding GPS/mGPS.

Author, year	Study design	Enrolling site	Inpatients or Outpatients	N	GPS/ mGPS	Prevalence of GPS score	Median survival time	Hazard ratio (95%CI)	Median KPS
Souza, 2018	Single center prospective study	Outpatient clinic and PCU at comprehensive cancer center	Inpatients and Outpatients	172	mGPS	0: 99 (65.1%) 1: 7 (4.6%) 2: 46 (30.2%)	-	Ref 0 1-2: HR 1.46 (1.09-2.22)	-
Pantano, 2016	Single center prospective study	Outpatient clinic	Outpatients	186	mGPS	0: 131 (70.4%) 1: 17 (9.1%) 2: 38 (20.4%)	0: 4.5 M n 1: 2.9 M 2: 0.5 M	-	-
Chou, 2015	Single center retrospective study	First referred to SCT	Inpatients	217	GPS	0: 15 (6.9%) 1: 56 (25.8%) 2: 146 (67.3%)	0: 66 days (0-140.5) 1: 11 days (1.5-20.4)2: 17 days (12.8-21.2)	Ref 0 1: HR 2.12 (1.13-3.97) 2: HR 1.71 (0.96-3.05)	-
Miura, 2015	Multi-center prospective study	PCU, SCT, HPC	Inpatients and home	###	GPS	0: 86 (7.4%) 1: 251 (21.6%) 2: 823 (70.9%)	0: 58 days (48-81) 1: 43 days (37-50) 2: 21 days (19-24)	Ref 0 1: HR 1.07 (0.78-1.49) 2: HR 1.36 (1.01-1.87)	-
Partridge, 2012	Single center retrospective study	Palliative care center	Inpatients	102	mGPS	0: 16 (15.7%) 1: 20 (19.6%) 2: 66 (64.7%)	-	Ref 0 1: HR 1.35 (0.528-3.100)2: HR 2.71 (1.252-5.875)	-
Brown, 2007	Multi-center prospective study	Hospice, general ward, Outpatients clinic	Inpatients and Outpatients	50	GPS	0: 11 (22.0%) 1: 26 (52.0%) 2: 13 (26.0%)	0: 15.4M (6.6-24.2)1: 4.0M (2.3-5.6)2: 1.0M (0.5-1.4)	-	0: 80 (60-100)1: 70 (40-90) 2: 60 (30-80)

PCU: palliative care unit, SCT: supportive care consultation team, HPC: home palliative care, GPS: Glasgow prognostic score, CI: confidence interval, Ref: reference, M: months, KPS: Karnofsky performance status

[7]. One study showed 3-week and 6-week prognostic capability [6]. The GPS/mGPS showed evidence of prognostic value in patients with palliative care settings.

The value of the GPS/mGPS in physical function

One study described the performance status using Karnofsky performance status (Table 1) [8]. Worse GPS score had lower performance status. Other studies did not evaluate performance status. No study evaluated functional status including activities of daily living (ADL). In conclusion, GPS/mGPS showed evidence of correlation with performance status but no information about ADL.

The value of GPS/mGPS in QOL and symptoms

There were no studies about the correlation between GPS/mGPS scores and QOL or symptoms (Table 1).

The value of GPS/mGPS in cancer cachexia

The correlation between GPS/mGPS score and weight loss is 6. The increase in GPS score showed high prevalence of weight loss within 1 month. However, the degree of weight loss was not investigated. Other variables on the definition of cancer cachexia were also mentioned. Therefore, we concluded that the GPS/mGPS correlated with weight loss; however, there was little evidence about other characteristics in cancer cachexia.

Discussion

The present review showed that the increase in GPS/mGPS score had correlated with poor prognosis, poor performance status and weight loss in patients without anti-tumor therapy. However, no evidence about ADL, QOL and symptoms existed. The GPS/mGPS is quite simple and consisted of C-reactive protein and albumin. C-reactive protein, which is induced by inflammatory cytokines, reflects systemic inflammation at the time. Albumin, which has a turnover period of 21 days, reflects decreased intake and malnutrition. However, inflammatory cytokines decrease the synthesis of albumin and increase acute phase protein in the systemic inflammatory condition. Therefore, the increase of GPS/mGPS might imply prolonged systemic inflammation and decreased intake, which is a catabolic state and cancer cachexia in advanced cancer patients. GPS/mGPS was correlated with weight loss in this review. The GPS/mGPS might be suitable as a prognostic and cachexia marker in cancer patients in palliative care settings.

This review found no study about the correlation between GPS/mGPS and physical function, QOL and symptoms. A previous study including advanced cancer patients who were first referred for palliative care services showed that CRP, one component of GPS/mGPS, had positive correlation with the prevalence of symptoms and ADL disabilities [9]. Another study showed that CRP was associated with QOL, function and symptoms [10]. Therefore, GPS/mGPS might be correlated with physical function, QOL and symptoms.

However, GPS/mGPS in patients without anti-tumor therapy had a limitation. The cut-off point of 10 mg/dL for CRP and 3.5 g/dl for albumin might be inadequate for this population. This review showed that most patients had GPS/mGPS score is 2. More detailed classification will be needed to adequately reflect the general conditions of advanced cancer patients in palliative care settings.

Conclusion

The GPS/mGPS were correlated with poor prognosis, poor performance status and weight loss, but had no evidences about ADL, QOL and symptoms in cancer patients who had received supportive care without plan of any anti-tumor therapy. The investigation about the impact of GPS/mGPS on ADL, QOL and symptoms, or the development of more detailed GPS/mGPS classification, which is suitable for these settings, might be the next study theme.

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Conflicts of Interest

The authors declare no conflict of interest.

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