



Eastern Cooperative Oncology Group score: Agreement between non-small-cell lung cancer patients and their oncologists and clinical implications



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ABSTRACT

Background: Oncologists use Eastern Cooperative Oncology Group (ECOG) performance score to assess patients' performance status (PS) and guide treatment decisions, but patients may not necessarily agree on their scores. We compared PS scores assessed by patients with non-small-cell lung cancer (NSCLC) to those of their medical oncologists to explore concordance and whether any discrepancy may have implications on treatment and survival prediction.

Methods: NSCLC patients self-assessed their PS scores using the Patient-Generated Subjective Global Assessment tool prior to chemotherapy. Kappa was used to assess agreement of ECOG scores between patients and oncologists. Survival was calculated from date of chemotherapy using Kaplan Meier method. **Results:** A total of 79 patients (median age 63 years, 87% stages IIIB/IV) were included. PS scores differed in 34 (43%) cases. The inter-rater reliability between patients and their oncologists was Kappa=0.35 ($p < 0.001$). In 31/34 (91%) of cases where the physicians and patients did not agree, physicians were more optimistic in their PS rating. If only patient PS scores were used, 11 patients (14%) would be deemed unfit for chemotherapy (ECOG ≥ 3) and 21 patients (27%) would be excluded from most chemotherapy trials (ECOG ≥ 2). ECOG (0 versus > 0) irrespective of assessor was predictive of survival ($p=0.017-0.023$).

Conclusions: There was only fair agreement in PS scores assessed by NSCLC patients and oncologists, with patient scores usually poorer. A number of patients would have excluded themselves from therapeutic interventions including clinical trials based on their PS rating.

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1. Introduction

Assessment of function and self-care is integral in evaluating the impact of disease and its treatment on a cancer patient. The Eastern Cooperative Oncology Group (ECOG) performance status (PS) scoring system (Table 1) is a simple tool that is used in everyday practice to rate a patient's PS [1]. The extant literature has shown ECOG PS to correlate with response to treatment, quality of life and survival in a number of malignancies including non-small

cell lung cancer (NSCLC), small cell lung cancer (SCLC), breast cancer and ovarian cancer [2–7].

Physicians' assessment of PS is an important part of the decision-making process regarding a patients' suitability for treatments that may influence survival. Patients with metastatic NSCLC are generally considered not suitable for chemotherapy if their ECOG PS was greater than two. In the clinical trial setting, the eligibility criteria is often more stringent, with patients requiring a PS of one or less to be eligible for many chemotherapy trials. Both physicians and patients' assessment of ECOG PS have been found to be predictive of survival in NSCLC and SCLC, as well as for disease stage in NSCLC. However, patients and physicians do not necessarily agree in their rating of PS scores [8,9]. Ando et al.

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Table 1
Eastern Cooperative Oncology Group (ECOG) Performance Status scoring system with corresponding Patient-Generated Subjective Global Assessment (PGSGA) description.

ECOG Performance Status	Description	Corresponding Patient-Generated Subjective Global Assessment (PGSGA) description
0	Fully active, able to carry out all pre-disease function without restriction.	Normal with no limitations.
1	Restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature (eg., light house work, office work).	Not my normal self, but able to be up and about with fairly normal activities.
2	Ambulatory and capable of all self-care but unable to carry out any work activities. Up and about < 50% waking hours.	Not feeling up to most things, but in bed or chair less than half the day.
3	Capable of only limited self-care. Confined to bed or chair > 50% waking hours.	Able to do little activity and spend most of the day in bed or chair.
4	Completely disabled. Cannot carry out any activities of self-care. Fully confined to bed or chair.	Pretty much bed-ridden, rarely out of bed.
5	Dead	

showed that physicians' assessment of their NSCLC patients' PS tended to be more 'optimistic' than the patient-assessed scores [9]. Another study found that both physician and patient-assessed PS was significant at predicting survival in patients with a primary lung cancer, with physician-assessed scores being marginally better, even after adjusting for stage or gender [8].

The current study aims to determine the agreement between ECOG PS scores by patients with NSCLC and their treating oncologist, and to assess if any difference in scores has potential implications for treatment and survival prediction.

2. Materials and methods

Between February 2007 and January 2011, chemotherapy-naïve patients with a pathologic diagnosis of NSCLC who were scheduled to start chemotherapy were invited to participate in two investigator-initiated studies, one evaluating Inter-Ethnic Differences between Caucasian and Asian patients in pharmacokinetics and toxicity from chemotherapy, and the other evaluating the nutritional status of patients at Concord Cancer Centre, Sydney, Australia [10,11]. Both studies were approved by the Concord Repatriation General Hospital Human Research Ethics Committee and all patients provided written informed consent.

Patients self-assessed their physical and functional status as part of their nutritional status evaluation using the Patient-Generated Subjective Global Assessment (PGSGA) questionnaire (Table 1), prior to commencement of chemotherapy. The physician assessed the patient's ECOG PS score using the conventional scoring system detailed in Table 1, as per routine practice. Both physician and patient were blinded to the other's PS score. The medical oncologist recommended patient treatment including radiotherapy, chemotherapy, surgery and/or supportive care based on stage, subtype and patient's functional status.

Simple Kappa coefficient was used to assess agreement of PS scores between patients and oncologists. The PS scores were categorized into 0 and > 0. We did not stratify the results according to single ECOG values as patients with physician ECOG PS rating of ≥ 2 were few in numbers and not deemed fit for a platinum doublet. Survival was calculated from the date of chemotherapy until the date of death or the last recorded hospital encounter. Actuarial survival was calculated using Kaplan Meier methods and reported as cumulative survival (95% Confidence Interval [95%CI]). Log-rank test was used to determine if the PS score was associated with survival. Statistical analyses were performed using the Statistical Product and Service Solutions (SPSS)(Version 21).

3. Results

A total of 79 chemotherapy-naïve patients with NSCLC were included in this study. The median age was 63 years (range 38–81

years) with the majority of patients being male (68%). Most patients (87%) had stage IIIB or IV disease and 11% had stage IIIA; 82% were classified as non-squamous histology. Fifty nine patients (75%) were Caucasian and 20 (25%) were of Asian ethnicity.

4. Discrepancies and concordance in scoring between patients and their physicians

PS scores differed in 34 (43%) cases (Table 2). The inter-rater reliability between patients and their medical oncologists was Kappa=0.35 ($p < 0.001$).

In 31 out of 34 (91%) cases where the physicians and patients did not agree, physicians were more optimistic in their ECOG PS rating. Six out of nine (67%) patients rated as ECOG PS 2 by their oncologist, self-rated their ECOG PS as 3.

5. Correlation of ECOG PS score with survival

Irrespective of the assessor, ECOG PS (0 versus > 0) was predictive of survival, with 18.7 versus 12.1 months ($p=0.023$) and 17.4 versus 11.1 months ($p=0.017$) for patient and oncologist-assessed ECOG PS respectively (Figs. 1 and 2).

In a *post hoc* subgroup analysis, 39 patients whose oncologists assessed their scores as ECOG PS 0, but who self-rated their PS as > 0, had a trend for shorter median survival compared to those patients who self-rated their scores as ECOG PS 0 (16.7 months versus 18.2 months respectively, $p=0.31$) (Fig. 3).

6. Potential treatment implications of the discordance in ECOG assessment

If only patient PS scores were used, 11 patients (14%) would be deemed unfit for chemotherapy (ECOG ≥ 3) and 21 patients (27%)

Table 2
Eastern Cooperative Oncology Group (ECOG) performance status scores as assessed by physician and patient.

	ECOG PS Score	Physician				
		0	1	2	3	Total
PATIENT	0	21	3	0	0	24
	1	13	21	0	0	34
	2	2	5	3	0	10
	3	3	2	6	0	11
	4	0	0	0	0	0
Total		39	31	9		79

Italicized and bold numbers reflect the numbers of cases where there was concordance between the ECOG PS scores between physician and patient.

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