The clinical utility of Memorial Symptom Assessment-Short Form and Condensed Memorial Symptom Assessment Scale in Turkish lung cancer patients

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Abstract

Introduction: Symptom assessment is essential in the palliative care of patients with cancer. We studied the Memorial Assessment Scale Test-Short Form (MSAS-SF) and Condensed Memorial Assessment Test (CMSAS) in Turkish lung cancer patients.

Material and Method: Fifty-one patients with lung cancer (47 non-small, 4 small cell) were staged according to the International Association for the Study of Lung Cancer 2007 and filled the MSAS-SF. Karnofsky performance status, TNM staging, MSAS-SF and CMSAS scores were recorded. The study was approved by the local research ethics committee.

Results: The mean age of 51 patients was 61.7 ± 9. Fifty-one percent were staged as M1 while 49% were staged as M0. The mean values for global distress index, PHYS (physical symptom distress), PSYCH (psychological symptom score) and MSAS-SUM were 1.15 ± 0.8, 0.9 ± 0.8, 1.13 ± 1.03 and 0.82 ± 0.47 in order. The mean values for CPHYS (physical symptom distress for Condensed MSAS), CPSYCH (psychological symptom score for CMSAS) and CSUM (sum scores) were 1.2 ± 0.75, 1.22 ± 1.1 and 1.16 ± 0.69 in order. Cronbach's alpha coefficients for MSAS-SF and CMSAS were 0.861 and 0.728 in order. Summary scores for both MSAS-SF and CMSAS-SF were significantly higher in patients with M1 disease than from M0 disease. In addition, PHYS and MSAS-SUM in MSAS-SF were significantly correlated with T and N stage. The area under curve for MSAS-SF and CMSAS were 0.793 and 0.70 in order.

Conclusion: MSAS-SF and CMSAS demonstrated significantly higher scores in lung cancer patients with M1 disease than patients with M0 disease. Further studies are needed to evaluate the usefulness of MSAS-SF and CMSAS in lung cancer patients.

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Key words
cancer – Karnofsky scale – MSAS-Short Form – pulmonary – symptoms – TNM staging

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Ethics
The study protocol was approved by the local Ethics Commitee of Dışkapı Yıldırım Beyazıt Educational and Research Hospital, Ankara, Turkey.

Conflict of interest
The authors have stated explicitly that there are no conflicts of interest in connection with this article.

Introduction

Symptom assessment is essential in the palliative care of patients with cancer. The Memorial Symptom Assessment Scale (MSAS) is a validated multidimensional symptom assessment instrument with 32 prevalent symptoms (1). The short form of MSAS has been validated in a population of cancer patients (2). The Turkish version of Memorial Assessment Scale Test-Short Form (MSAS-SF) has been validated in cancer patients (3). The Condensed Memorial Symptom Assessment Scale (CMSAS) form includes some of the

symptoms in the MSAS-SF and has been shown to contain both quality of life and survival information approximately equivalent to the original 32 items in cancer patients (4). The CMSAS has totally 14 items. A detailed registry-based study in Turkey demonstrated lung cancer incidence rates to be 60.3 per 100 000 in males and 7.7 per 100 000 in females, and the incidence rate was highest for lung cancer among all cancer types in males (5). We have planned to evaluate the correlation of MSAS-SF and CMSAS with Karnofsky performance score (KPS) and tumor stage (TNM). We hypothesized that MSAS-SF and CMSAS could be useful in differentiating M1 patients from M0 lung cancer patients, and help distinguish lung cancer patients with metastasis in the diagnosis period.

Materials and method

We have included 51 patients with proven lung cancer (47 non-small and 4 small cell) between January 2011 and January 2012 to our study in Dışkapı Y.B. Educational and Research Hospital, Department of Respiratory Medicine. Our hospital is a tertiary referral hospital. All patients with respiratory malignancies are diagnosed and staged in our department. The therapy is planned in the oncology department in either our hospital or in another center. Computerized tomography of the lung and cranium, abdominal ultrasonography, and bone scintigraphy were done, and TNM staging was performed in accordance with the International Association for the Study of Lung Cancer report (6). All the patients filled the form of MSAS-SF (2). The patients did not know their diagnosis and the metastasis status at the time of answering the questionnaires.

The MSAS is a validated multidimensional assessment instrument with 32 highly prevalent symptoms. The MSAS was originally developed by Portenoy *et al.* to assess and quantify a large range of physical and psychological symptoms in advanced cancer patients (1). It consists of three subscales with 32 symptoms, and patients must rate the presence, frequency and distress caused by each symptom. Chang *et al.* subsequently developed and validated the MSAS-SF, which is a modified version of the MSAS designed to reduce patient burden. The MSAS-SF consists of the same 32 symptoms as the original MSAS, but requires patients to rate the distress caused by 28 physical symptoms and the frequency of four psychological symptoms (2). The global distress index (GDI) measures four psychological (feeling sad, worrying, feeling irritable and feeling nervous) and six physical symptoms (lack of energy, pain, lack of appetite, feeling drowsy, constipation and dry mouth). The physical symptom subscale (PHYS) distress score comprises 12 physical symptoms (lack of energy, pain, lack of appetite, feeling drowsy, constipation, dry mouth, nausea, vomiting, change in taste, weight loss, feeling bloated and dizziness). The psychological symptom subscale (PSYCH) distress score includes six symptoms (worrying, feeling sad, feeling nervous, difficulty sleeping, feeling irritable and difficulty concentrating). Turkish version of the MSAS-SF is validated and reported previously (3).

Condensed MSAS (CMSAS) has totally four items, 11 physical symptoms and 3 psychological symptoms asking the distress and the frequency similar to MSAS-SF. Chang *et al.* validated CMSAS in cancer patients (4).

The KPS (7) was determined in all the patients. The study complied with the Declaration of Helsinki and was approved by the local research ethics committee, and all the patients gave their written informed consent prior to participation.

Statistical analysis

SPSS v 16.0 (SPSS, Inc., Chicago, IL, USA) was used for statistical analysis. Pearson pairwise correlation coefficients were calculated among MSAS-SF, CMSAS scores, subscores and KPS scores. Independent sample *t*-test was used to compare scores in M1 and M0 patients. Chi-squared test was used to define symptom significance for M1 patients. Receiver operating curves (ROCs) were drawn to evaluate the validity of MSAS-SF and CMSAS for the diagnosis of M1 lung cancer patients. Area under curves (AUC) and 95% confidence interval were calculated. For all analysis, $P < 0.05$ was considered significant. Cronbach's alpha coefficient was used to assess internal reliability.

Results

Forty-seven male and 4 female patients with proven lung cancer (47 non-small cell, 4 small cell lung cancer) with bronchoscopic biopsy were admitted to the study. Non-small lung cancer cases were 7 adeno cancer, 25 epidermoid cancer, and 15 undifferentiated and reported as non-small cancer. The mean age was 61.7 ± 9 (44–81). Of the patients, 3.9% were T1, 19.6% were T2, 21.6 were T3 and 52.9% were staged as T4. Of the patients, 11.8% were N0, 7% were N1, 49% were N2 and 29.4% were staged as N3. Of the patients, 51% were M1 while 49% were M0. The staging frequencies are shown in Table 1. The mean KPS was 73.4 ± 14.5 (20–90).

Table 1. The frequencies of the stages

Stage	Percent (frequency)
Stage 1A	2% (1)
Stage 1B	7.8% (4)
Stage 2A	2% (1)
Stage 3A	17.6% (9)
Stage 3B	23.5% (12)
Stage 4	47.1% (24)

Table 2. The descriptive analyses of MSAS and CMSAS scores

Name of scores	Mean (min–max) ± standard deviation
GDI	1.15 (0–3.04) ± 0.8
PHYS	0.9 (0–3.2) ± 0.7
PSYCH	1.13 (0–4) ± 1.03
MSAS-SUM	0.82 (0–2) ± 0.47
CPHYS	1.2 (0–2.76) ± 0.75
CPSYCH	1.22 (0–4) ± 1.1
CSUM	1.16 (0–2.86) ± 0.69

CMSAS, the mean Condensed MSAS; CPHYS, physical symptom score; CPSYCH, psychological symptom score; CSUM, sum of CMSAS scores; GDI, global distress index; MSAS-SUM, sum MSAS; PHYS, physical symptom distress; PSYCH, psychological symptom distress; MSAS, Memorial Assessment Scale Test.

The mean MSAS scores (GDI; PSYCH, psychological symptom distress; PHYS, physical symptom distress; and MSAS-SUM, sum MSAS) and the mean CMSAS scores (CPHYS, physical symptom score; CPSYCH, psychological symptom score; and CSUM, sum of CMSAS scores) are shown in Table 2. All the subscores and the total scores of MSAS-SF except PHYSC score in MSAS-SF are significantly higher in M1 disease than M0 disease patients (Table 3). PHYS and MSAS-SUM in MSAS-SF are significantly correlated with T and N stage (Table 4).

Both the MSAS scores and the CMSAS scores correlated significantly with KPS scores and M1 disease (Table 4). In addition to those, MSAS-SUM, PSYCHO and PHYS were significantly correlated with CSUM, CPSYCO and CPHYS, respectively (Table 5).

Table 3. MSAS-SF and CMSAS scores in M1 disease and M0 disease

	M1 disease ($n = 25$)	M0 disease ($n = 26$)	P
GDI	1.5 ± 0.15	0.81 ± 0.13	0.01
PSYCH	1.44 ± 0.21	0.83 ± 0.18	0.03
PHYS	1.33 ± 0.77	0.48 ± 0.38	0.00
MSAS-SUM	1.05 ± 0.1	0.6 ± 0.1	0.00
CPHYS	1.5 ± 0.1	0.9 ± 0.1	0.00
CPSYCH	1.39 ± 0.2	1.06 ± 0.2	0.3
CSUM	1.41 ± 0.13	0.92 ± 0.1	0.01

CMSAS, the mean Condensed MSAS; CPHYS, physical symptom score; CPSYCH, psychological symptom score; CSUM, sum of CMSAS scores; GDI, global distress index; MSAS-SUM, sum MSAS; PHYS, physical symptom distress; PSYCH, psychological symptom distress; MSAS-SF, Memorial Assessment Scale Test-Short Form.

Table 4. Pearson correlation coefficients between T, N, M, Karnowsky and MSAS-SF and CMSAS scores

	T	N	M	Karnowsky
GDI	0.23	0.33*	0.44**	–0.56**
	$P = 0.1$	$P = 0.02$	$P = 0.001$	$P = 0.00$
PSYCH	0.84	0.13	0.3*	–0.39**
	$P = 0.6$	$P = 0.37$	$P = 0.03$	$P = 0.005$
PHYS	0.31*	0.44**	0.58**	–0.63**
	$P = 0.03$	$P = 0.001$	$P = 0.00$	$P = 0.00$
MSAS-SUM	0.37**	0.42**	0.48**	–0.6**
	$P = 0.01$	$P = 0.003$	$P = 0.00$	$P = 0.00$
CPHYS	0.23	0.17	0.39**	–0.4**
	$P = 0.1$	$P = 0.23$	$P = 0.005$	$P = 0.004$
CPSYCH	–0.69	0.01	0.14	–0.29*
	$P = 0.6$	$P = 0.95$	$P = 0.31$	$P = 0.04$
CSUM	–0.69	0.15	0.36*	–0.47**
	$P = 0.6$	$P = 0.29$	$P = 0.01$	$P = 0.001$

*$P < 0.05$, **$P < 0.01$.

CMSAS, the mean Condensed MSAS; CPHYS, physical symptom score; CPSYCH, psychological symptom score; CSUM, sum of CMSAS scores; GDI, global distress index; MSAS-SUM, sum MSAS; PHYS, physical symptom distress; PSYCH, psychological symptom distress; MSAS-SF, Memorial Assessment Scale Test-Short Form.

Table 5. Pearson correlation coefficients between MSAS scores and Condensed MSAS scores

	CPHYS	CPSYCH	CSUM
GDI	0.64*	0.66*	0.75*
	$P = 0.00$	$P = 0.00$	$P = 0.00$
PSYCH	0.40*	0.85*	0.68*
	$P = 0.004$	$P = 0.00$	$P = 0.00$
PHYS	0.70*	0.14	0.55*
	$P = 0.00$	$P = 0.33$	$P = 0.00$
MSAS-SUM	0.69*	0.47*	0.73*
	$P = 0.00$	$P = 0.00$	$P = 0.00$

*$P < 0.001$.

CPHYS, physical symptom score; CPSYCH, psychological symptom score; CSUM, sum of CMSAS scores; CMSAS, Condensed Memorial Assessment Test; GDI, global distress index; PSYCH, psychological symptom distress; PHYS, physical symptom distress; MSAS-SUM, sum MSAS; MSAS, Memorial Assessment Scale Test.

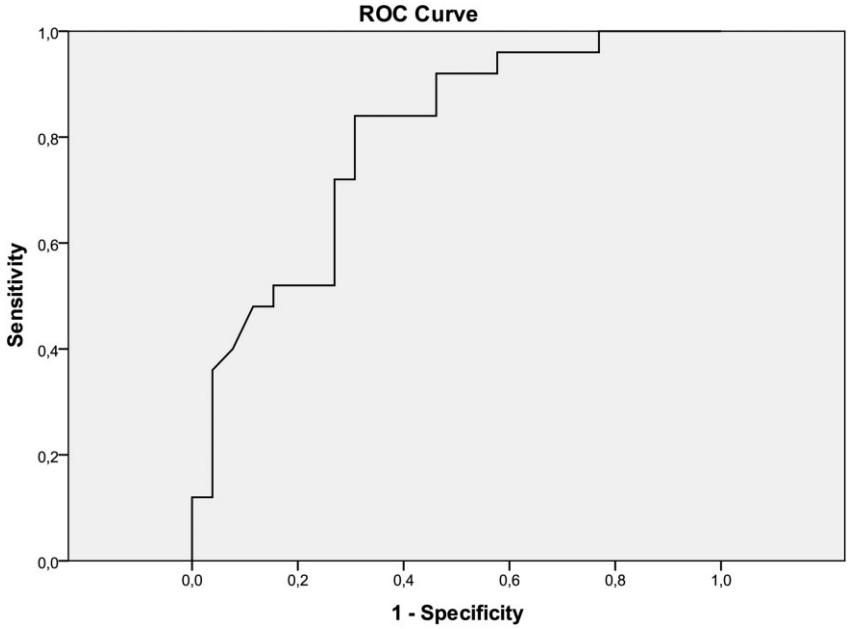

Figure 1. Area under curve for total MSAS-SF score. Diagonal segments are produced by ties. MSAS-SF, Memorial Assessment Scale Test-Short Form; ROC, receiver operating curve.

Cronbach's alpha coefficients were 0.861 (1.785–0.915) for MSAS-SF and 0.728 (0.566–0.835) for CMSAS.

AUC for total MSAS-SF score and total CMSAS (CSUM) were 0.793 (95% confidence interval 0.658–0.912) and 0.70 (95% confidence interval 0.56–0.854) in order in ROC curve analysis (Figs. 1 and 2).

The most common physical symptoms seen in our patients were weight loss (70.6%), pain (70.6%), cough (62.7%), lack of energy (54.9%), lack of appetite (41.2%), difficulty sleeping (39.2%), shortness of breath (37.3%), feeling drowsy (37.3%) and sweating (37.3%). The frequency of the psychological symptoms were feeling sad (62.7%), worrying (39.2%),

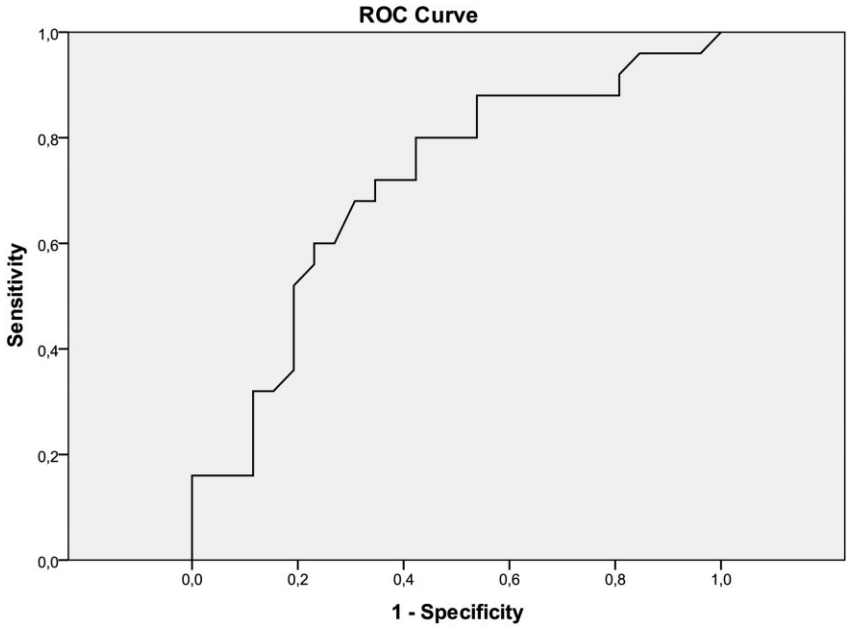

Figure 2. Area under curve for total CMSAS score. Diagonal segments are produced by ties. CMSAS, Condensed Memorial Assessment Test; ROC, receiver operating curve.

Table 6. Frequency of 32 symptoms of MSAS-SF and 14 symptoms of Condensed MSAS

Symptoms	Frequency %
Difficulty in concentrating	24*
Pain	70.6*
Lack of energy	54.9*
Cough	62.7
Changes in skin	7.8
Dry mouth	4.6*
Nausea	17.6*
Feeling drowsy	37.3*
Numbness/tingling in hands and feet	15.7
Difficulty sleeping	39.2*
Feeling bloated	20.4
Problems with urination	12.2
Vomiting	7.8
Shortness of breath	37.3*
Diarrhea	5.9
Sweats	37.3
Mouth sores	8
Problems with sexual interest or activity	26.7
Itching	14
Lack of appetite	41.2*
Dizziness	26
Difficulty in swallowing	19.6
Changes in the way of food tastes	15.7
Weight loss	70.6*
Hair loss	0
Constipation	21.6*
Swelling of arms or legs	7.8
'I don't like like myself'	31.4
Feeling sad	62.7*
Worrying	39.2*
Feeling irritable	37.3
Feeling nervous	37.3*

*The symptoms in MSAS-SF and Condensed MSAS-SF.
MSAS, Memorial Assessment Scale Test; MSAS-SF, Memorial Assessment Scale Test-Short Form.

feeling irritable (37.3%) and feeling nervous (37.3%) (Table 6).

When analyzed separately, 'shortness of breath' ($P = 0.02$), 'sweating' ($P = 0.047$), 'lack of appetite' ($P = 0.009$), 'weight loss' ($P = 0.002$) and 'feeling sad' ($P = 0.03$) items were found significantly more in M1 patients by chi-squared analysis.

Discussion

We had hypothesized that MSAS-SF and CMSAS could be useful in differentiating M1 lung cancer patients. We have shown that both MSAS-SF and CMSAS-SF were able to differentiate M1 disease from M0 disease in lung cancer patients. AUC for total scores of MSAS-SF (MSAS-SUM) and CMSAS were 0.793 and 0.70 in order in differentiating M1 cases from M0 cases. MSAS-SF provided slightly more confidence in this differentiation with a higher AUC than CMSAS. In addition, PHYS and MSAS-SUM in MSAS-SF were significantly correlated with T and N stage.

Lung cancer causes many symptoms, but the symptoms of lung cancer in Turkish patients have not been studied in detail. Since cancer patients usually have more than one physical and psychological symptom, a comprehensive symptom analysis is required to provide sufficient symptom control (2). We presented data on symptoms in Turkish patients from the MSAS-SF. The most common symptoms were weight loss, pain, cough, lack of energy and lack of appetite in our study group.

Sweating was also seen commonly in our study group. Release of inflammatory mediators during infections, autoimmune diseases and malignancies can temporarily raise the thermoneutral zone (TNZ), inducing chills and shivering that causes core body temperature to rise. Sweating occurs when the levels of these mediators and the TNZ return to normal (8). There are no prevalence values reported for sweating specifically in lung cancer patients. There are studies of prevalence in hematological malignancies (9, 10), in advanced cancer (11) and in prostate cancer (12), investigating symptoms in different cancer patients and patients receiving chemotherapy in lung cancer with MSAS (13, 14).

MSAS-SF subscale scores were found to show a sharp boundary between patients with and without metastatic disease in Chung's study. Similarly, patients with M1 disease lung cancer had significantly higher scores in MSAS-SF and CMSAS in our study. So MSAS-SF and CMSAS have convergent validity based on the extent of disease and Karnofsky scale in lung cancer.

MSAS-SF has been used not only in cancer patients, but in breathless patients of COPD with cancer, to investigate the symptom burden and the palliative care needs (15), and in AIDS (16) and chronic renal disease (17).

The validity and reliability of Turkish version (3), Chinese version (18, 19) and Swedish version of MSAS-SF (20) were also reported. The physiological and the psychological symptom subscores enable to define the burden of the disease and to plan the palliative care needs.

CMSAS has 11 physical item. The scoring is simple and it takes 2–4 min to complete the test. CMSAS is found significantly to correlate with MSAS-SF in different cancer patients (4, 19) and in lung cancer

patients in our study. Because the MSAS-SF was administered, and CMSAS values were derived from the MSAS-SF, these results cannot be accepted as a validation of the CMSAS, but the results encourage to use it separately in lung cancer patients.

The physical and the psychological symptom subscores will enable clinicians to define the symptom burden of lung cancer in Turkey and to plan for their palliative care needs. Furthermore, while radiological tests are the gold standard for staging, high scores with the MSAS SF or the CMSAS can be a cautionary signal for the patient's oncologist or primary physician and guide decisions for workup. These results encourage future prospective studies to evaluate the usefulness of MSAS-SF or CMSAS in the assessment and management of lung cancer patients.

Most of the patients had non-small lung cancer and most of the patients had epidermoid carcinomas. The strength of the study is the homogeneous group of patients with lung cancer. The limitations of the study are the limited number of patients, preventing subgroup analysis, and the lack of survival and treatment response data. Most of the patients had their therapies in another oncology department and were lost to follow-up, so survival could not be analyzed. As we have no test–retest data, we cannot yet conclude that MSAS-SF and CMSAS can be used to follow patients, but the results encourage further studies to enable their use in lung cancer patients.

In conclusion, both MSAS-SF and CMSAS can be used in lung cancer patients. Scores from both assessments are significantly higher in patients with metastatic disease, and additionally all of the MSAS-SF subscales were significantly higher in metastatic patients. Prospective studies are needed to evaluate the usefulness of MSAS-SF and CMSAS in evaluating treatment and survival in lung cancer patients.

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