

Quality of Life and Utility in Patients with Non-Small Cell Lung Cancer

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Abstract

Background: Although several studies have determined quality of life in patients with lung cancer, there is still little information about the use of generic questionnaires [e.g. the 36-item Short Form health survey (SF-36)] and utility questionnaires [e.g. the EuroQOL instrument (EQ-5D)] in this disease.

Objectives: To (i) measure quality of life and utility in patients with non-small cell lung cancer (NSCLC) using the SF-36 and the EuroQOL questionnaires; (ii) to evaluate the impact of some clinical variables on quality of life and utility; (iii) to assess the correlation between the measurements produced by the 2 questionnaires.

Study design: Cross-sectional study.

Participants: 95 patients from 15 Italian hospitals with NSCLC (93% male, mean age 62 years) completed both questionnaires.

Results: The mean scores for the 8 domains of the SF-36 ranged from 20.8 (physical role) to 63.0 (social functioning). The mean physical and mental summed scores of the SF-36 were 36.8 [standard deviation (SD) 9.8] and 43.0 (SD 11.5), respectively. The EuroQOL mean score was 0.58 (SD 0.32) in the self-classifier (SC) version and 0.58 (SD 0.20) in the visual analogue scale (VAS) version. Among the clinical variables that affected quality of life and utility, the presence of metastasis had the greatest impact: patients with metastasis had statistically significantly lower scores for 2 domains of the SF-36 (physical functioning, $p = 0.009$; bodily pain, $p = 0.016$), for the physical component summed score of the SF-36 ($p = 0.015$) and for both utility estimates (EuroQOL-SC, $p = 0.027$; EuroQOL-VAS, $p = 0.038$) than patients without metastasis. Both the SC and VAS EuroQOL scores showed a statistically significant correlation with each of the 8 domains of the SF-36. The scores for both the SF-36 and the EuroQOL in patients with NSCLC were considerably worse (relative differences ranging from -8 to -73%) than the corresponding values (normative data) previously reported for healthy individuals.

Conclusions: Our study quantified the degree to which quality of life is impaired in patients with NSCLC, showed that the presence of metastasis had an important role, and indicated a strong correlation between the measurements produced by the 2 questionnaires. The EuroQOL measurements obtained from these patients will aid evaluation of the cost-utility ratio for NSCLC therapies.

Numerous studies have measured quality of life in patients with non-small cell lung cancer (NSCLC).^[1] Most of these investigations have adopted a merely descriptive approach without using standard quality-of-life (QOL) questionnaires,^[2] while other studies have based their measurements on disease-specific instruments.^[3-7] Very few investigations in patients with NSCLC^[1] have used generic questionnaires [e.g. the 36-item Short Form health survey (SF-36)] and/or utility questionnaires [e.g. the EuroQOL instrument (EQ-5D)].

The SF-36 is considered to be the standard questionnaire in the context of generic instruments for measuring quality of life.^[8-10] This questionnaire, which explores 8 domains of quality of life by constructing 8 respective subscales, has already been applied to a variety of disease conditions in a very large number of studies. The EuroQOL^[11] reflects a different approach because, in its application to each individual patient, a single parameter (utility) is generated as an aggregate indicator of the patient's QOL preferences at that time (range of variation for utility: 0 to 1). Quality-adjusted survival [quantified by calculating quality-adjusted life years (QALYs)] is an increasingly used parameter in modern pharmacoeconomic studies; utility measurements contribute to constructing QALYs (by weighting the duration of survival on the basis of quality of life) and allow the correlation of clinical outcome with cost of treatments (e.g. in the calculation of the cost per QALY gained).

In NSCLC, only 3 preliminary reports^[12-14] have used the SF-36. The study by Kurtz et al.^[12] was, however, limited to measuring only 2 subscales of the SF-36 (namely physical functioning and physical role) and so the other 6 dimensions were not determined. The study by Mangione et al.^[13] included surgical patients aged >50 years exclusively. The study by Wang et al.,^[14] which was designed to measure the relationship between patients' pain severity and quality of life, included patients with any type of cancer (n = 216) and did not report separate results for the patient subgroup with lung cancer (n = 65).

The objectives of our study were 3-fold: (i) to

quantify quality of life and utility in patients with NSCLC using the SF-36 and the EuroQOL questionnaires; (ii) to evaluate the impact on quality of life of some clinical variables (relative to the patient's clinical history and the type of therapeutic intervention); (iii) to assess the correlation between the QOL measurements produced by the 2 questionnaires.

Methods

Study Design and Data Collection

Our study used a cross-sectional design; patients were recruited from 15 Italian hospitals. Investigators from these centres agreed to participate in this study and were requested to consecutively enrol a maximum of 8 patients with NSCLC per centre over the period from 1 July 1999 to 15 September 1999.

There were 2 eligibility criteria for patient enrolment: (i) diagnosis of NSCLC and (ii) referral as an inpatient or outpatient to the units of Oncology, Internal Medicine, Radiotherapy, Pneumology, Respiratory Physiopathology, General Surgery or Chest Surgery in the participating centres. There were no limits on age or type of treatment, and there was no distinction between newly diagnosed patients versus patients already diagnosed at previous visits. When eligibility criteria were met, the inclusion criterion was the presence of written consent from the patient to participate in the study.

For the purposes of our study, the following information was obtained from each patient: QOL measurements based on the SF-36 questionnaire (responses to the 36 questions and date of the interview); utility measurements based on the EuroQOL questionnaire [responses to the 5 questions of the EuroQOL self-classifier (SC) version, response to the EuroQOL visual analogue scale (VAS) version and date of the interview]; age; gender; date of diagnosis; presence of metastasis at the time of the interview; whether surgical resection of the tumour had been carried out; and whether the patient had received chemotherapy or radiotherapy.

The information for items 3 to 9 was retrieved

Table I. Characteristics of the 95 patients with non-small cell lung cancer enrolled in this study of quality of life and utility

Mean age (y) \pm SD	62.5 \pm 9.3
Gender (men/women)	88/7
Mean time since diagnosis (mo) \pm SD	10.6 \pm 19.6
Presence of metastasis	60/95 (63%)
Surgical resection	28/95 (29%)
Chemotherapy	82/95 (86%)
Radiotherapy	21/93 (23%)
SD = standard deviation.	

from the patient's hospital card or was directly obtained from the patient's physician. These items were used as stratification variables for our statistical analysis, and their impact on the results was assessed for both the SF-36 and the EuroQOL questionnaires. Data on patients who declined to respond to the questionnaires were recorded separately.

Questionnaires and Scoring Methods

The SF-36 questionnaire measures 2 main health concepts (physical and mental health) with 36 items and 8 multi-item scales (physical func-

tioning, role physical, bodily pain, general health, vitality, social functioning, role emotional, mental health). An additional 1-item measure assesses self-evaluated change in health status. Scores are assembled using summed ratings;^[8-10] the raw scores are then transformed to a 0 to 100 scale (with 0 and 100 assigned to the lowest and highest possible value, respectively). Higher transformed scores indicate better health. Two component summed scores, one concerning the physical dimension and the other concerning the mental, are also calculated as a result of a weighted combination of the original scale.^[15] The SF-36 health survey has been available in Italian since 1990.

The EuroQOL questionnaire^[11,16] consists of 5 questions and contains a VAS. Two separate utility estimates are calculated, the first (EuroQOL-SC) from the 5 questions, which are processed through a simple computation algorithm,^[11,16] and the second (EuroQOL-VAS) directly from the VAS.

In our study, the 2 questionnaires were used in the Italian version^[16,17] and were self-administered in accordance with current recommendations.^[8,16] When necessary, assistance to the patient during the

Table II. Quality-of-life scores obtained by application of the 36-item Short Form health survey in patients with non-small cell lung cancer (NSCLC) and healthy individuals^a

Domain	No. of evaluable patients	Scores in patients with NSCLC ^b	Normative values ^c	Difference between NSCLC and healthy scores (%) ^d
Physical functioning	93	54.3 \pm 28.2	84.5 \pm 23.2	-36
Role physical	90	20.8 \pm 35.6	78.2 \pm 35.9	-73
Bodily pain	93	50.3 \pm 28.8	73.7 \pm 27.6	-32
General health	88	48.6 \pm 21.2	65.2 \pm 22.2	-25
Vitality	86	49.9 \pm 24.1	61.8 \pm 20.7	-19
Social functioning	91	63.0 \pm 26.1	77.4 \pm 23.3	-19
Role emotional	90	31.8 \pm 41.5	76.2 \pm 37.2	-58
Mental health	86	61.4 \pm 21.5	66.6 \pm 20.9	-8
Physical component summed score	82	36.8 \pm 9.8		
Mental component summed score	83	43.0 \pm 11.5		

a Means \pm standard deviation.

b The responses to the additional 1-item measure of self-evaluated change in health status (question: compared with 1 year ago, how would you rate your health in general now?) were the following: first level (much better now than 1 year ago), n = 10 (10.5%); second level (somewhat better now than 1 year ago), n = 5 (5.3%); third level (about the same as 1 year ago), n = 19 (20.0%); fourth level (somewhat worse now than 1 year ago), n = 35 (36.8%); fifth level (much worse now than 1 year ago), n = 25 (26.3%); no response, n = 1 (1.1%).

c Values derived from a sample of 2031 healthy participants studied by Apolone and Mosconi.^[17]

d Calculated from the ratio of the 2 respective means.

Table III. Subgroup values for the domains 1 to 4 of the 36-item Short Form health survey in patients with non-small cell lung cancer

Subgroup	Physical functioning			Role physical			Bodily pain			General health		
	mean	n	SD	mean	n	SD	mean	n	SD	mean	n	SD
Gender												
Male	54.6	86	28.5	20.3	85	35.3	50.4	86	29.2	49.4	81	21.3
Female	50.3	7	24.9	30.0	5	44.7	48.6	7	26.1	39.4	7	18.2
Surgery												
Yes	48.7	27	24.4	14.8	27	25.3	44.5	28	19.1	42.7	26	20.3
No	56.6	65	29.7	23.8	62	39.3	52.3	64	32.0	51.1	61	21.4
Chemotherapy												
Yes	52.8	80	27.3	19.8	77	35.0	49.7	81	28.2	49.6	78	21.1
No	63.4	13	33.0	26.9	13	40.1	54.0	12	33.8	41.5	10	21.7
Radiotherapy												
Yes	48.8	21	23.0	23.8	20	35.8	52.9	21	27.3	45.7	21	21.1
No	56.1	70	29.8	20.6	68	36.1	49.3	70	29.5	49.4	65	21.5
Metastasis												
Present	48.8	59	28.1	18.0	57	33.7	45.3	58	27.6	47.3	58	20.5
Absent	63.4	33	26.4	26.6	32	39.1	58.0	34	29.6	52.2	29	22.3
Age												
<65y	57.2	46	26.9	18.3	45	31.3	50.9	45	24.7	50.1	42	21.3
≥65y	51.5	47	29.4	23.3	45	39.7	49.7	48	32.5	47.3	46	21.2
Time since diagnosis												
<12mo	55.7	69	29.3	22.0	66	37.3	50.0	69	31.2	51.7	63	20.9
≥12mo	46.8	20	23.5	15.0	20	27.4	46.3	21	17.3	39.5	21	18.4

n = evaluable patients; SD = standard deviation.

questionnaire was given by his or her clinician or by the hospital pharmacist of the respective centre.

Normative Data

To assess the impact of NSCLC on quality of life, the results obtained using the SF-36 in our patients were compared with those from 2031 healthy Italian individuals (normative data) reported previously by Apolone and Mosconi.^[17] Since normative data from Italian individuals are lacking for the EuroQOL, the results from our study based on this utility questionnaire were compared with those previously measured from a population of healthy individuals from the UK.^[18]

Sample Size Calculations

We empirically selected a sample size of 100 patients on the basis of the statistical power calculations of previous studies on quality of life (e.g. Arpinelli et al.^[10]). These studies have shown that

a population of 100 patients (alpha level 10%, 1-tailed) or 200 patients (alpha level 5%, 2-tailed) is needed to detect a 10-point group difference in SF-36 health survey scale scores (assuming a statistical power of 80%).

Statistical Analysis

The parameters estimated from the 2 questionnaires (namely, scores for each of the 8 domains of SF-36, summed physical and mental scores of SF-36, and utility values according to EuroQOL-SC and EuroQOL-VAS) were presented as means with standard deviation (SD) inclusive of subgroup analyses where appropriate. No univariate statistical analysis was carried out to determine the impact of the stratification variables on the SF-36 and the EuroQOL measurements because of the presence of numerous simultaneous pairwise comparisons (in terms of the number of clinical variables and the number of QOL and utility parameters).^[19] To ad-

dress this issue, a multivariate regression analysis (SPSS computer program for Windows, Version 8.0, 1997) was conducted that tested the statistical association between each of the SF-36 and EuroQOL parameters and the stratification variables; this analysis estimated the significance level for each variable and calculated partial correlations to determine whether the associations were direct or inverse. A backward stepwise method of variable elimination was used, wherein the variables with $p < 0.10$ were eventually retained; this $p = 0.10$ limit was chosen to explore not only the associations with clear-cut statistical significance ($p < 0.05$) but also those suggested in terms of statistical trends ($0.05 < p < 0.10$).

A separate analysis tested the relationships between the SF-36 and the EuroQOL results (using Pearson's correlation); this analysis was also carried out using the SPSS computer program mentioned above.

Results

Our study recruited a total of 95 patients from 15 Italian hospitals. All patients gave their informed consent. No patients declined to respond to the questionnaires. The main characteristics of this patient cohort are summarised in table I.

The results of administration of the SF-36 questionnaire to the 95 patients are shown in table II. The mean scores for the 8 domains of the SF-36 ranged from 20.8 (role physical, SD 35.6; 90 evaluable patients) to 63.0 (social functioning, SD 26.1; 91 evaluable patients). The mean summed physical and mental scores of the SF-36 were 36.8 (SD 9.8) and 43.0 (SD 11.5), respectively. In comparison with normative data (table II), NSCLC was found to decrease the score for the 8 domains of the SF-36 by 8 to 73% (table II).

The results obtained with the EuroQOL were the following: EuroQOL-SC score 0.58 (SD 0.33;

Table IV. Subgroup values for the domains 5 to 8 of the 36-item Short Form health survey in patients with non-small cell lung cancer

Subgroup	Vitality			Social functioning			Role emotional			Mental health		
	mean	n	SD	mean	n	SD	mean	n	SD	mean	n	SD
Gender												
Male	48.9	80	24.4	62.9	84	26.2	32.1	84	41.6	61.0	80	22.1
Female	63.3	6	15.1	64.4	7	27.3	27.8	6	44.4	68.0	6	11.0
Surgery												
Yes	45.8	25	18.0	63.2	27	22.8	29.5	26	35.7	60.1	25	16.3
No	51.4	60	26.4	62.7	63	27.7	33.3	63	44.0	61.8	60	23.6
Chemotherapy												
Yes	50.4	74	23.6	62.5	80	26.0	32.0	78	41.4	62.8	74	21.7
No	46.9	12	28.3	66.3	11	27.9	30.5	12	43.7	53.3	12	19.6
Radiotherapy												
Yes	53.6	21	23.7	63.3	21	26.2	27.0	21	37.5	62.1	21	22.7
No	48.7	63	24.6	62.5	68	26.6	34.3	67	43.0	60.9	63	21.5
Metastasis												
Present	47.6	56	25.5	60.9	57	25.7	28.6	56	39.4	59.2	56	21.1
Absent	54.4	29	21.5	66.9	33	27.1	38.4	33	45.0	65.4	29	22.4
Age												
<65y	51.6	41	25.1	65.8	44	26.0	34.8	44	42.5	63.4	41	21.3
≥65y	48.5	45	23.4	60.3	47	26.2	29.0	46	40.8	59.7	45	21.8
Time since diagnosis												
<12mo	51.2	62	24.6	62.9	67	26.3	31.8	67	42.0	61.7	62	22.2
≥12mo	43.5	20	21.5	61.5	20	27.1	33.4	19	40.1	57.6	20	19.5

n = evaluable patients; SD = standard deviation.

Table V. Subgroup values for the summed physical and mental scores of the 36-item Short Form health survey and for the utility measurements based on the EuroQOL instrument in patients with non-small cell lung cancer

Subgroup	Summed scores of the SF-36						EuroQOL scores					
	Physical component summed score			Mental component summed score			EuroQOL-SC			EuroQOL-VAS		
	mean	n	SD	mean	n	SD	mean	n	SD	mean	n	SD
Gender												
Male	36.7	77	9.8	42.7	77	11.7	0.58	85	0.34	0.58	87	0.21
Female	37.7	5	11.1	46.1	6	8.7	0.67	7	0.16	0.59	7	0.16
Surgery												
Yes	33.9	25	8.9	42.7	24	9.5	0.56	26	0.27	0.56	27	0.14
No	38.0	56	10.0	43.0	58	12.4	0.59	65	0.35	0.59	66	0.23
Chemotherapy												
Yes	36.5	73	9.9	43.5	73	11.5	0.59	79	0.32	0.58	81	0.20
No	39.0	9	8.9	39.0	10	11.0	0.57	13	0.39	0.62	13	0.24
Radiotherapy												
Yes	36.3	20	7.9	43.0	21	11.2	0.53	21	0.30	0.56	21	0.21
No	37.0	60	10.5	42.9	60	11.9	0.60	70	0.34	0.58	71	0.21
Metastasis												
Present	35.1	53	9.5	42.5	53	11.1	0.53	59	0.36	0.55	59	0.22
Absent	39.8	28	9.8	44.0	29	12.6	0.68	32	0.24	0.63	34	0.17
Age												
<65y	37.1	39	8.9	44.5	39	12.1	0.64	46	0.31	0.61	47	0.21
≥65y	36.5	43	10.6	41.6	44	10.9	0.54	46	0.34	0.56	47	0.20
Time since diagnosis												
<12mo	37.6	59	10.0	42.9	60	11.7	0.61	67	0.34	0.59	70	0.21
≥12mo	32.9	20	7.9	44.4	19	11.5	0.50	21	0.30	0.52	20	0.18

n = evaluable patients; SC = self-classifier; SD = standard deviation; VAS = visual analogue scale.

92 evaluable patients), EuroQOL-VAS score 0.58 (SD 0.20; 94 evaluable patients). Since normative data from UK participants suggest a mean utility of 0.78,^[18] our results indicate a mean relative reduction in utility of 26% in patients with NSCLC.

Subgroup means (with SD) according to the various stratification variables are presented in tables III and IV (domains of the SF-36) and in table V (summed scores and utility instruments). Among the clinical variables that affected quality of life and utility (multivariate regression analysis, see table VI), the presence of metastasis had the greatest impact: in patients with metastasis, 2 dimensions of the SF-36 (physical functioning, $p = 0.009$; bodily pain, $p = 0.016$), the physical component summed score of the SF-36 ($p = 0.015$) and both utility estimates of the EuroQOL (EuroQOL-SC, $p = 0.027$;

EuroQOL-VAS, $p = 0.038$) had significantly lower scores than in patients without metastasis.

Table VII illustrates our correlation analyses involving the parameters of the SF-36. Pearson's coefficient for the correlation between the EuroQOL-SC and the EuroQOL-VAS was 0.54 (91 evaluable patients, $p < 0.001$).

Discussion

The comparison of our study with those conducted by Wang et al.,^[14] Kurtz et al.,^[12] and Mangione et al.^[13] suggests good agreement across these 4 patient cohorts. In general, the SF-36 results from our patients with NSCLC were very similar to those obtained by Wang et al.^[14] in individuals with any kind of cancer. Both the study by Wang et al.^[14] and our study indicated that the SF-36 domain that results in the greatest disease-related impairment is

the 'role physical' [with a mean score of 20.8 (SD 35.6) in our patients vs 8.4 (SD 23.7) in Wang et al.'s patients^[14]].

The American study by Mangione et al.,^[13] which included patients with operable lung cancer (n = 123), measured a series of SF-36 domains at the preoperative visit. Since the American patients were at a much earlier disease stage, it is not surprising that the SF-36 subscales used in the study by Mangione et al.^[13] were much better (e.g. mean score of 69 for physical functioning, 51 for role physical, 76 for bodily pain, 68 for general health) than those of our patients (table II). The results from Kurtz et al.,^[12] who explored only 2 domains of the SF-36 in 130 patients with lung cancer, are in reasonably good agreement with ours (physical functioning subscale, mean 43.1 for the Kurtz et al. study^[12] vs 54.3 for our study; role physical subscale, mean 26.7 for the Kurtz et al. study^[12] vs 20.8 for our study). While the 3 studies mentioned above enrolled patients with different types of cancer (Kurtz et al.^[12] and Wang et al.^[14]) or with both cancer and non-cancer types of surgically treated diseases (Mangione et al.^[13]), one advantage of our study is that it was specifically focused on patients with NSCLC, and so the factors affecting quality of life and utility (with their inter-relationships) could be assessed within this single disease condition.

After introducing several clinical variables into our multivariate analysis, the presence of metastasis was found to be the main factor influencing quality of life. In fact, this variable affected the 2 SF-36 domains of physical functioning and bodily pain as well as the physical component summed score. Similarly, both utility estimates of the EuroQOL were negatively affected by the presence of metastasis.

The correlation of the EuroQOL-SC with the EuroQOL-VAS, though statistically significant, was not particularly strong (Pearson's correlation coefficient = 0.54). Hence, the 2 utility instruments were shown to reflect a somewhat different pattern from one another and did not seem to be mutually interchangeable. As pointed out in other studies,^[20]

VAS scores might not express trade-off measures whereas the self-classifier instrument is thought to be closer to a traditional trade-off score.

Our study had a number of limitations. For instance, no detailed data about therapeutic interventions and staging were collected during the study. Perhaps more importantly, no disease-specific questionnaires [e.g. the European Organisation for Research and Treatment of Cancer (EORTC),^[21] the Functional Assessment of Cancer Therapy-Lung (FACT-L)^[22] or the Lung Cancer Symptom Scale^[6]] were employed. Indeed, the SF-36 fails to capture lung cancer symptoms and adverse effects induced by therapies (e.g. nausea and vomiting, diarrhoea, insomnia, cough, etc.), and so a disease-specific questionnaire may have been useful to explore these QOL components. Our choice not to include any disease-specific instrument was made to avoid

Table VI. Results of the multivariate regression analysis to assess the impact of the stratification variables on the domains of the 36-item Short Form health survey (SF-36) and on the utility estimates based on the EuroQOL in patients with non-small cell lung cancer

QOL parameter	Stratification variables retained in the analysis ^a	Partial correlation ^b	Statistical significance
SF-36 domains			
Physical functioning	Metastasis	-0.276	p = 0.009
Role physical			
Bodily pain	Metastasis	-0.255	p = 0.016
General health	Surgery	-0.207	p = 0.060
Vitality			
Social functioning			
Role emotional			
Mental health	Metastasis	-0.208	p = 0.064
	Chemotherapy	0.195	p = 0.083
SF-36 summed scores			
Physical component	Metastasis	-0.275	p = 0.015
Mental component			
EuroQOL parameters			
EuroQOL-SC	Metastasis	-0.236	p = 0.027
EuroQOL-VAS	Metastasis	-0.220	p = 0.038

a The cut-off point for retaining a variable in the analysis was p = 0.10.

b A negative correlation coefficient indicates that the stratification variable worsens the quality of life or the utility parameter while a positive value indicates improvement.

QOL = quality-of-life; **SC** = self-classifier; **VAS** = visual analogue scale.

Table VII. Correlation between the various scores of the 36-item Short Form health survey (SF-36) and the 2 utility estimates based on the EuroQOL instrument in patients with non-small cell lung cancer

SF-36 score for the domain	EuroQOL-SC	EuroQOL-VAS
Physical functioning		
Pearson Correlation	0.732	0.556
p-value	<0.001	<0.001
n	91	93
Role physical		
Pearson Correlation	0.350	0.385
p-value	0.001	<0.001
n	88	90
Bodily pain		
Pearson Correlation	0.618	0.450
p-value	<0.001	<0.001
n	90	92
General health		
Pearson Correlation	0.397	0.452
p-value	<0.001	<0.001
n	87	87
Vitality		
Pearson Correlation	0.595	0.685
p-value	<0.001	<0.001
n	85	85
Social functioning		
Pearson Correlation	0.636	0.391
p-value	<0.001	<0.001
n	89	91
Role emotional		
Pearson Correlation	0.372	0.401
p-value	<0.001	<0.001
n	88	90
Mental health		
Pearson Correlation	0.595	0.477
p-value	<0.001	<0.001
n	85	85
Physical component summed score		
Pearson Correlation	0.655	0.505
p-value	<0.001	<0.001
n	82	82
Mental component summed score		
Pearson Correlation	0.493	0.445
p-value	<0.001	<0.001
n	82	83

n = evaluable patients; SC = self-classifier; VAS = visual analogue scale.

an excessive burden of interviews and to minimise refusals to participate in the interviews. The SF-36 and the EuroQOL questionnaires were chosen because of their different respective constructs (ana-

lytical description of quality of life based on scales common to other disease conditions for the SF-36; synthetic measurement of quality of life in terms suitable for inclusion in economic studies for the EuroQOL). Attempts to convert the results from the SF-36 into a single utility measurement are currently under way,^[23] and their results will shed light on whether the simultaneous application of these 2 instruments in the same patients is worthwhile.

A few studies have examined the relationship between these 2 instruments in other disease conditions (e.g. an English study conducted in 2253 patients with stroke,^[24] a study from Scotland conducted in 85 patients with chronic fatigue syndrome^[25]); there are no such studies in patients with NSCLC. Hence, our simultaneous use of the 2 questionnaires in patients with NSCLC is an original approach.

Conclusion

The section of our study based on the SF-36 substantially confirmed the results from previous investigations and provided new information on the critical issue about the variables affecting quality of life. Among these, the presence of metastasis was the main factor influencing quality of life, while the other variables seemed to have a marginal role. Interestingly enough, there was a strong correlation between the measurements of the SF-36 and of the EuroQOL. The section of our study based on this latter questionnaire provided original data in terms of utility that could be useful for future cost-effectiveness studies.

The relevance of our findings to the every-day care of patients with NSCLC is that new data have been produced to reflect the patients' preferences in terms of quality of life and to better weigh the cost of treatments aimed at this disease condition against their ultimate outcome as perceived by the patient.

The section of our study based on the EuroQOL provided original data in terms of utility that could be useful for future cost-effectiveness studies evaluating NSCLC.

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