Effects of prognostic factors and treatment on survival in advanced non-small cell lung cancer

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ÖZET

İleri evre küçük hücreli dışı akciğer kanserli olgularda tedavi öncesi prognostik faktörler ve tedavinin sağkalım üzerine etkisi

Ocak 2000-Aralık 2002 tarihleri arasında hastanemizde tanısı konulmuş ve takibi yapılabilen evre IIIB ve IV küçük hücreli dışı akciğer kanserli 304 olgu retrospektif olarak incelendi. Olguların tedavi öncesi demografik, klinik ve laboratuvar verileri ile farklı tedavi modalitelerinin sağkalım üzerine etkileri araştırıldı. Olguların 31 (%10.2)'i kadın, 273 (%89.8)'ü erkekti ve yaş ortalaması 60.59 ± 10.73 idi. Kaplan-Meier yöntemi ile yapılan analizde medyan sağkalım 6.0 ± 0.5 (%95 GA: 5.1-6.9) ay bulundu. Oniki aylık sağkalım oranı %25.27 ± 2.99, 24 aylık sağkalım oranı ise %11.48 ± 2.77 olarak hesaplandı. Toplam 33 değişkenin kullanıldığı tek değişkenli analizde 12 değişkenin prognoz üzerine istatistiksel olarak anlamlı etkisi olduğu görüldü (p< 0.05). Kötü prognozu işaret eden bu değişkenler yaş (> 70), performans skoru (ECOG > 1), nefes darlığı, periferik lenfadenomegali (LAM), mediasten invazyonu, plevral efüzyon ve uzak metastaz varlığı; LDH, CA 19.9, CA 125 yüksekliği ve hastalara küratif (> 50 Gy) radyoterapi (RT), kemoterapi (KT) uygulanmaması idi. Cox's regresyon yöntemi kullanılarak yapılan çok değişkenli analizde ise, ileri yaş, mediasten invazyonu ve uzak metastaz varlığı bağımsız prognostik faktör olarak bulunmazken başta ECOG performans durumu (PS) > 1 olmak üzere (p= 0.000), KT almamış olmak (p= 0.000), küratif RT almamış olmak (p= 0.018), nefes darlığı (p= 0.035), periferik LAM (p= 0.022) ve plevral efüzyon varlığı (p= 0.043) bağımsız prognostik faktörler olarak bulundu.

Anahtar Kelimeler: *Akciğer kanseri, küçük hücreli dışı, prognostik faktörler, radyoterapi, kemoterapi.*

SUMMARY

Effects of prognostic factors and treatment on survival in advanced non-small cell lung cancer

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In this study, 304 stage III-B and IV non-small cell lung cancer (NSCLC) cases diagnosed and followed up in our hospital between January 2000 and December 2002 are retrospectively analysed. The effects of demographic, clinical, laboratory

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findings and different therapeutic modalities on survival were investigated. Of the cases, 31 (10.2%) were women, 273 (89.8%) were men and mean age was 60.59 ± 10.73. Analysis by the Kaplan-Meier method revealed that median survival was 6.0 ± 0.5 (95% CI: 5.1-6.9) months and 12 and 24-month survival rates were 25.27 ± 2.99% and 11.48 ± 2.77% respectively. By univariate analysis of 33 parameters, 12 of them were found to be effective on survival and this relationship was statistically significant (p< 0.05). These parameters indicating poor prognosis were age > 70, ECOG performance score > 1, dyspnea, peripheral lymphadenomegaly (LAM), mediastinal invasion, pleural effusion, distant metastasis, elevated serum LDH, CA 19.9, CA-125 values, not receiving curative radiotherapy (RT) (> 50 Gy) or chemotherapy (CT). A multivariate analysis by Cox regression method revealed that advanced age, mediastinal invasion and metastatic disease were not independent prognostic factors on survival whereas ECOG performance score > 1 (p= 0.000), absence of CT (p= 0.000) and curative RT (p= 0.018), dyspnea (p= 0.035), peripheral LAM (p= 0.022) and pleural effusion (p= 0.043) were independent prognostic factors on survival.

Key Words: *Lung cancer, non-small cell, prognostic factors, radiotherapy, chemotherapy.*

Incidence of lung cancer has shown a parallel increase with increased tobacco consumption in last 50 years and lung cancer is the most frequent cancer worldwide (1,2). Surgery may play curative role in non-small cell lung cancer (NSCLC), provided that diagnosis is early enough. Unfortunately, most cases are diagnosed at advanced, inoperable stages (2). Despite presence of various chemotherapeutic agents, chemotherapy (CT) and/or radiotherapy (RT) have limited effect on survival in advanced stage lung cancer (1,3,4). Prognostic factors are first identified using univariate analysis of survival. Multivariate analysis is necessary to define their relative importance and order them according to their impact on survival (5). In contrast to small cell lung cancer (SCLC), prognostic factors for NSCLC remain controversial (6). Previous studies have revealed relationship between performance status and stage of the disease and various clinical, biochemical and histopathological factors such as age, gender, presence of weight loss, dyspnea, malignant pleural effusion, serum lactate dehydrogenase (LDH) level, type of the tumor are also thought to effect prognosis and survival (1,3,5). Our purpose in this study was to investigate effects of prognostic factors and treatment modalities on prognosis and survival in advanced stage lung cancer patients diagnosed in our clinic between years 2000 and 2002.

MATERIALS and METHODS

We retrospectively analysed 304 stage IIIB and IV NSCLC patients diagnosed in Dr. Lütfi Kirdar Kartal Education and Research Hospital Department of Chest Diseases between January 2000 and December 2002 and followed up by Oncology and Chest Diseases departments. Before treatment, patients were evaluated by recording age, gender, presence of weight loss, smoking and alcohol consumption habits, cardiopulmonary comorbidity, hoarseness, superior vena cava syndrome (SVCS), clubbing, palpable peripheral LAM, serum levels of LDH, alkaline phosphatase (ALP), tumor markers, FEV_1/FVC ratio, mediastinal invasion, pleural effusion, presence of atypical cells in pleural effusion, TNM classification (presence of T4, N2, N3 and M1 lesions), metastases to lung, brain, bone or multiple organs in stage IV, performance status (PS) according to Eastern Cooperative Oncology Group (ECOG) scale, cell type of the tumor. Administration of over 50 Gy RT or CT, presence of cisplatin in the CT protocol were noted for finding out the effect of treatment on prognosis (Table 1,2) (7). Initial work-up consisted of clinical examination, complete blood count, electrocardiography, routine biochemical analysis chest X ray and thoracal computed tomography scan for all patients and also tumor markers such as CEA, CA 15-3, CA 19.9, CA 125, sputum cytology, abdominal computed tomography scan, fiberoptic bronchoscopy, transthoracic fine needle aspiration biopsy or tru-cut biopsy, mediastinoscopy, thoracal magnetic resonance imaging (MRI), abdominal ultrasonography, cranial computed tomography, cranial MRI and bone scans for some of the patients in need of additional analysis for diagnosis and staging. Staging was made according to International Staging System (8).

Table 1. Demographic data, physical examination and laboratory findings of the cases.

	n (%)	Median survival*	p		n (%)	Median survival*	p
Gender				LDH	241		
Male	273 (89.8)	6.0 ± 0.5	0.9161	>	92 (38.1)	3.0 ± 0.6	**0.0013**
Female	31 (10.2)	4.0 ± 0.8		≤	149 (61.8)	7.0 ± 1.0	
Age				CEA	112		
> 70	70 (23)	4.0 ± 0.8	**0.0195**	>	55 (49.1)	5.0 ± 1.3	0.2374
< 70	234 (76.9)	6.0 ± 0.5		≤	57 (50.8)	7.0 ± 1.4	
Smoking	301			CA 15.3	84		
> 30 pack year	185 (61.4)	5.0 ± 0.6	0.0654	>	46 (54.7)	6.0 ± 1.5	0.9737
< 30 pack year	116 (38.5)	7.0 ± 0.9		≤	38 (45.2)	5.0 ± 0.7	
Alcohol				CA 19.9	105		
> 35 cl/day	29 (9.5)	6.0 ± 0.8	0.8264	>	40 (38.0)	4.0 ± 0.7	**0.0473**
< 35 cl/day or no	275 (90.4)	6.0 ± 0.6		≤	65 (61.9)	8.0 ± 2.3	
Dyspnea				CA 125	85		
Yes	137 (45.0)	4.0 ± 0.4	**0.0108**	>	50 (58.8)	4.0 ± 0.6	**0.0033**
No	167 (54.9)	7.0 ± 0.8		≤	35 (41.1)	13.0 ± 1.1	
Weight loss				ALP	196		
Yes	145 (47.6)	6.0 ± 0.4	0.5852	>	85 (43.3)	4.5 ± 0.8	0.4545
No	159 (52.3)	6.0 ± 0.9		≤	111 (56.6)	6.0 ± 0.9	
SVCS				FEV_1/FVC	173		
Yes	18 (5.9)	5.0 ± 2.6	0.6181	≥ 70%	108 (62.4)	6.0 ± 1.2	0.1257
No	286 (94.0)	6.0 ± 0.5		< 70%	65 (37.5)	5.0 ± 0.5	
Clubbing							
Yes	62 (20.3)	7.0 ± 1.1	0.8203				
No	242 (79.6)	6.0 ± 0.4					
Hoarseness							
Yes	32 (10.5)	8.0 ± 1.2	0.5718				
No	272 (89.4)	6.0 ± 0.4					
Peripheral LAM							
Yes	23 (7.5)	3.0 ± 0.3	**0.0005**				
No	281 (92.4)	6.0 ± 0.5					
PS (ECOG)							
> 1	170 (55.9)	3.0 ± 0.3	**< 0.0001**				
≤ 1	134 (44.0)	12.0 ± 1.0					

Statistically significant "p" values are written **bold**.

SVCS: Superior vena cava syndrome, PS: Performance status, ECOG: Eastern Cooperative Oncology Group.

* Median survival ± SD in months.

Cisplatin based regimens were employed with 75 mg/m^2 dosage in every 21 days combined with etopozide in 72, vinorelbine in 29, gemcitabine in 5 and paclitaxel in 3 patients. Curative RT was administered to the primary tumor and mediastinum 46 Gy given at 2.0 Gy fraction five times weekly, followed by 7 x 200 cGy booster dose. All cases with cranial metastases recieved 30 Gy irradiation in 10 fractions with Co60 GE Alcyon 11 machine for 5 days a week. Treatment was carried out in the Oncology department and patients were followed up in Oncology and Chest Diseases departments. Data obtained were provided in the files.

Overall survival was estimated as the period from application to the hospital until death. Kaplan-Meier method was used for survival analysis

Table 2. Data including cell type, tumoral (T), nodal (N) and metastasis (M) status and treatment modality.

	n (%)	Median survival*	p		n (%)	Median survival*	p
				Radiotherapy			
T4 cases	234 (76.9)	6.0 ± 0.4		≥ 50 Gy	57 (18.7)	17.0 ± 4.0	
T1-3 cases	70 (23.0)	6.0 ± 0.8	0.6722	< 50 Gy	247 (81.2)	4.5 ± 0.3	**< 0.0001**
				Chemotherapy			
Mediastinal invasion (+)	180 (59.2)	5.0 ± 0.4		Yes	133 (43.7)	9.0 ± 1.1	**< 0.0001**
Mediastinal invasion (-)	124 (40.7)	7.0 ± 1.2	**0.0478**	No	171 (56.2)	4.0 ± 0.4	
				Platinum in CT			
Pleural effusion (+)	80 (26.3)	4.0 ± 0.4		Yes	109 (81.9)	8.0 ± 0.9	
Pleural effusion (-)	224 (73.6)	7.0 ± 0.7	**< 0.0001**	No	24 (18.0)	12.0 ± 3.5	0.1728
Atypical cells in effusion (+)	17 (60.7)	4.0 ± 2.3					
Atypical cells in effusion (-)	11 (39.2)	3.0 ± 1.2	0.4464				
N3 cases	52 (17.1)	4.0 ± 0.8					
N0-2 cases	252 (82.8)	6.0 ± 0.5	0.2784				
N2 cases	140 (46.0)	7.0 ± 0.9					
N0-1 cases	164 (64.0)	5.0 ± 0.4	0.4706				
Stage IIIB	152 (50)	8.0 ± 1.1					
Stage IV	152 (50)	4.5 ± 0.5	**0.0001**				
Metastases							
Only lung-others	40 (13.1)	3.0 ± 0.6 – 5.0 ± 0.6	0.3264				
Only brain-others	18 (5.9)	5.0 ± 0.0 – 4.0 ± 0.5	0.1261				
Only bone-others	21 (6.9)	6.0 ± 1.4 – 4.0 ± 0.5	0.0618				
Multiorgan-others	31 (10.1)	4.0 ± 1.7 – 4.5 ± 0.5	0.6158				
Cell type							
Adeno Ca	66 (32.3)	6.0 ± 0.8					
Squamous Ca	138 (67.6)	6.0 ± 0.8	0.7006				

Statistically significant "p" values are written **bold**

* Median survival ± SD in months

and univariate analysis of 33 variables were calculated by log rank. Cox regression test was used for multivariate analysis for detection of independent variables effecting prognosis. All tests had 95% confidence interval.

RESULTS

Mean age of 273 (89.8%) male and 31 (10.2%) female patients was 60.59 ± 10.73. Final evaluation between December 20, 2002 and December 31, 2002 demonstrated that 93 of the patients survived whereas 211 had died. Mean follow-up period was 6.27 months. Twelve month survival was found to be 25.27 ± 2.99% and 24 months survival was 11.48 ± 2.77%. Kaplan-Meier survival analysis revealed the median survival to be 6.0 ± 0.5 months (Figure 1). When effects of epidemiological and clinical variables on prognosis were evaluated, age over 70, dyspnea, metastases to peripheral lymph nodes and ECOG PS > 1 were found to be poor prognostic factors ($p < 0.05$). Univariate analysis of laboratory findings revealed that elevated LDH, CA 19.9 and CA 125 levels indicated poor prognosis (Table 1).

Staging was made according to TNM classification. Cases with T4 and T1-3 tumors had no statistically significant difference whereas mediastinal invasion and malignant pleural effusion suggested poor prognosis in T4 cases. Cytologic investigation of the pleural fluid was carried out in 28 of 80 patients with pleural effusion and 17 of these had malignant cells. In 11 patients who underwent multiple pleural punctures and pleural biopsy, no malignant cells could be detected in pleural effusion. As all of the cases who had no malignant cells in pleural fluid were stage III-B or IV because of other reasons (nodal status, metastasis), thoracoscopy was not performed. Comparison of these cases revealed no statistically significance with respect to survival.

A highly significant better survival was observed in 152 stage IIIB patients (8.0 ± 1.1 months) compared to 4.5 ± 0.5 months in stage IV patients. There was no survival difference between single organ metastases to lung, brain or bone and multiple organ metastases. Adenocarcinoma and squamous cell carcinoma cases were compared, difference was nonsignificant (Table 2).

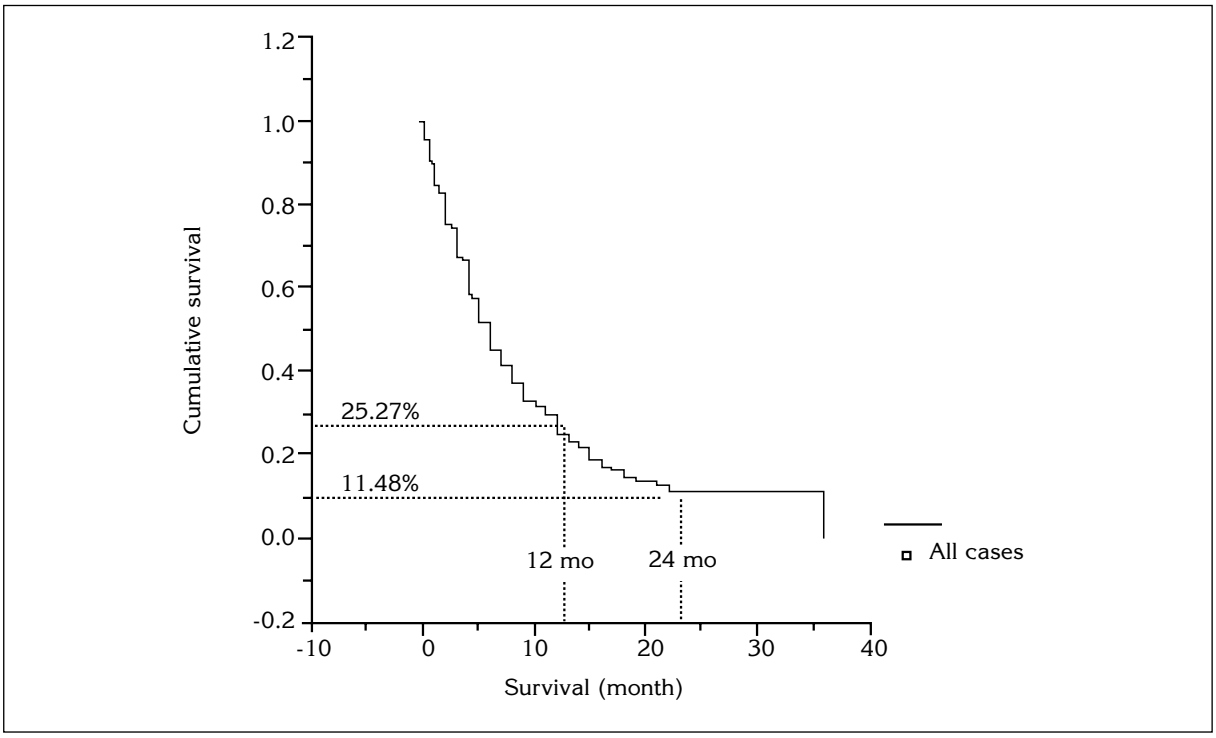

Figure 1. Survival curve, 12 and 24 months survival rates of advanced NSCLC cases.

Despite the fact that all our patients were inoperable due to TNM classification, one underwent left pneumonectomy and metastatectomy for single brain metastases and right lower lobectomy combined with surrenalectomy was applied to one patient. Postoperative staging was T2N1M1 for these two patients. Palliative spinal decompression was applied to 2 patients and 2 patients underwent brain metastatectomy. CT was employed to 133 patients, 109 of these being platinum-based regimen and the remaining 24 were vinorelbine as a single agent (n= 22) or combined with gemcitabine (n= 2). Patients receiving CT had significantly better prognosis whereas regimens with or without platinum showed no difference. Curative RT (> 50 Gy) was applied to 57 patients, who had significantly better prognosis than the others (Table 2).

Cox regression test demonstrated 6 parameters to be independent prognostic signs (Table 3). Dyspnea, peripheral LAM, pleural effusion and ECOG PS > 1 were poor prognostic factors. CT and curative RT indicated better prognosis and longer survival (Figure 2).

DISCUSSION

The prognosis of advanced stage NSCLC remains poor despite the recent improvements in response rates achieved using combination CT and RT. The current study was carried out to evaluate the prognostic factors for survival in 304 previously untreated patients with advanced stage (stage IIIB and IV) NSCLC. Sugiura et al analysed 197 stage IIIB and IV NSCLC patients and found 1 and 2 year survival rates to be 29% and 11%, respectively (9). Two year survival rates were 9% for IIIB and 7% for stage IV according to evaluation of 1565 cases by Sandro et al (1). Paesman et al, in a review of 1052 advanced stage NSCLC patients found 7.4 months 2 year survival rate with 29 weeks median survival (4). Another analysis of 81 patients demonstrated that median survival was 29 weeks for stage IIIB and IV patients (10). Median survival of 304 patients included in our study was calculated to be 6.0 ± 0.5 months according to Kaplan-Meier analysis. Twelve and 24 months survival rates (25.27 ± 2.99% and 11.48 ± 2.77%, respectively) were consistent with literature.

As has been demonstrated by previous studies, factors like PS and stage of the disease were clearly defined prognostic factors. Controversy still persists about effects of factors like age, gender, some clinical findings and biochemical parameters, pleural effusion, mediastinal invasion of the tumor and distant metastases. Better survival among women with lung carcinomas has alre-

Table 3. Prognostic factors in advanced NSCLC found by univariete and multivariate analysis.

		Comparison		
Variable	**n**	**Univariate (p)**	**Multivariate (p)**	**Risk ratio (%95 CI)**
Age > 70	70	0.0195	NS	1.149
Dyspnea	137	0.0108	**0.035**	**1.366**
Peripheral LAM	23	0.0005	**0.022**	**1.828**
PS ECOG > 1	169	0.0000	**< 0.0001**	**3.135**
High LDH level	92	0.0013	--------	------
High CA 19.9 level	40	0.0473	--------	------
High CA 125 level	50	0.0033	--------	------
Mediastinal invasion	180	0.0478	NS	1.324
Pleural effusion	80	0.0000	**0.043**	**1.326**
Distant metastases	152	0.0001	NS	1.031
CT	133	0.0000	**< 0.001**	**1.742**
Curative RT	57	0.0000	**0.018**	**1.829**

Independant prognostic factor "p" values are written **bold**

PS: Performance status, ECOG: Eastern Cooperative Oncology Group, CT: Chemotherapy, RT: Radiotherapy, NS: Non-significant.

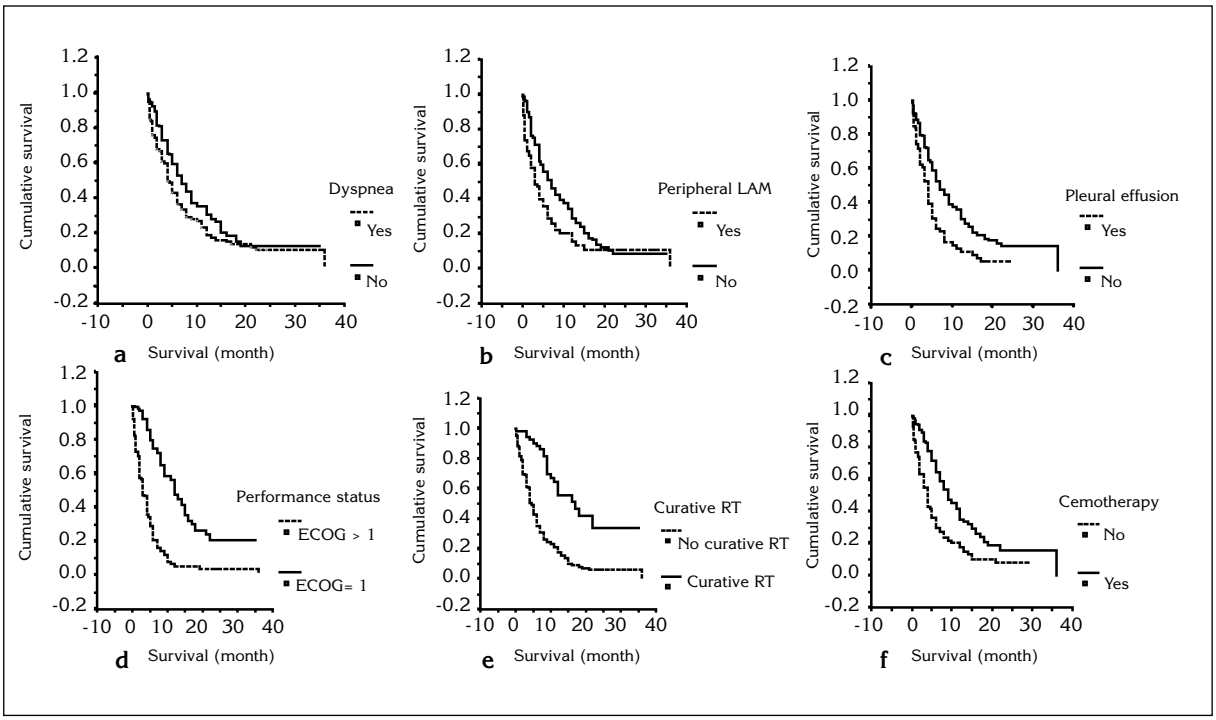

Figure 2. Comparison of survival in advanced NSCLC cases according to existance of dyspnea (a), peripheral LAM (b), pleural effusion (c), ECOG performance status (d), curative (> 50 Gy) radiotherapy (e) and chemotherapy (f).

ady been demostrated in a few studies but the reason of such difference remains obscure. In a study including 839 male and 198 female patients who underwent operation, mortality was 7% and 3%, respectively, having a statistically significant difference. Mean survival period was 30 months in females and 24 months in males, indicating that women have better survival, independent of age, presence of symptoms, smoking, type of surgery applied, histological type and stage of the tumor (11). Ferguson et al, in a series of 478 lung cancer patients, found women to have longer survival, with adenocarcinoma, squamous cell carcinoma and small cell carcinoma having statistically significant difference. They concluded that gender is an independent prognostic factor and female patients in IIIA, IIIB and IV NSCLC groups have longer survival (12). Similarly, Paesmans and Shinkai found longer survival in advanced stage NSCLC female patients, compared to males, indicating that gender is an independent prognostic factor (4,13). In contrast, there are various studies, including ours, showing no prognostic effect of sex on prognosis (1,3,6,9,14). Several studies demonstrate no effect of advanced age on survival whereas Van Dijck, Foucher, Moro and Paesmans point out that advanced age indicates poorer prognosis (2-4,6,14-16). Paesman, in another study, states that age is an independent prognostic factor in advanced stage NSCLC patients (4). According to univariate analysis in our study, patients over 70 years of age have shorter survival, nonetheless, multivariate analysis of 9 parameters indicate that age is not an independent prognostic factor. When symptoms and signs such as dyspnea, weight loss, SVCS, hoarseness, peripheral LAM, clubbing, PS are taken into consideration, PS, dyspnea and peripheral LAM were found to significantly effect survival as independent prognostic factors. Relationship between PS and prognosis and survival has been demonstrated by many investigators, PS being most important independent prognostic factor (1,3,4,6,9,14). Our study showed that median survival was 3.0 ± 0.3 in cases with PS ECOG > 1, with significant difference compared to 12.0 ± 1.0 months in ECOG 0 or 1

cases. Multivariate analysis demonstrated significant difference between dyspneic and nondyspneic cases with median survival of 4.0 ± 0.4 and 7.0 ± 0.8 months, respectively. However FEV_1/FVC ratio < 70% or ≥ 70% denoted no significant impact on survival. Our results are consistent with the study carried out by Sandro et al, concluding that dyspnea is an independent prognostic factor for stage III and IV patients (1). In this study, other poor prognostic factors were hoarseness, SVCS and weight loss. Nagio found insignificant correlation between weight loss and survival, and concluded that weight loss indicates worse prognosis only in cases with poor PS (3). Similarly, Paesman concluded that weight loss can be a marginal prognostic factor correlated with performance status (4). Our study demonstrated no effect of hoarseness, SVCS and weight loss on survival, but it must be pointed out that, in contrast to hoarseness and SVCS findings, weight loss was a subjective parameter of patients history in this retrospective study.

In our study, correlation between survival and biochemical parameters such as LDH, ALP and tumor markers such as CEA, CA 15.3, CA 19.9, Ca 125 was investigated with univariate analysis. As a result, normal LDH, CA 19.9 and CA 125 levels were associated with better survival, however as these values were not obtained for all cases, they could not be included in multivariate analysis. Shinkai et al report LDH as independent prognostic factor (13). However many studies show no correlation between LDH, ALP and CEA and survival (3,4,9,10).

Many investigators agree that stage of the tumor and survival are strongly correlated (4,9,10, 13,14). In an analysis conducted by Shinkai et al, stage was found to be a prognostic factor in univariate analysis but not an independent variable in multivariate analysis. They report correlation between survival, response rates to treatment and number, site of metastases, therefore considered these factors as independent prognostic factors, however bone, liver and central nervous system metastases had no effect on survival (13).

According to Sugiura, in univariate analysis of stages III and IV, N3 disease and stage of the tumor were significant and in multivariate analysis stage, nodal status and presence of pleural effusion were significant. Presence of malignant cells in pleural effusion had no effect on survival (9). Paesman reported that lung metastases did not influence survival whereas skin metastases was poor prognostic sign (4). In contrast to mentioned studies there are several others, like ours suggesting no correlation between stage and survival (1,12). Nagio demonstrated effect of stage and weight loss on survival in patients with high and low performance scores, respectively (3). In our study, factors evaluated relevant to stage were N and T status of the tumor, mediastinal invasion, pleural effusion, presence of lung, bone, brain or multiorgan metastases. Univariate analysis revealed significance in favor of stages IIIB, compared to stage IV (median survival 8.0 ± 1.1 vs 4.5 ± 0.5 months) and between patients with and without pleural effusion or mediastinal invasion. T and N status were not recognised as prognostic factors. Pleural effusion was the only independent prognostic factor with multivariate analysis. Presence of atypical cells in the fluid did not seem to effect survival. Rodrigus found median survival 3.1 months for patients with brain metastases, in whom this was the major cause of mortality (17). According to our study, these cases had similar survival with other stage IV patients. In a retrospective analysis of 361 cases, Charloux investigated correlation between histological subtype of NSCLC and prognosis and concluded that bronchoalveolar carcinoma (BAC) had longest median survival (21.7 months), followed by squamous cell carcinoma (21.6 months), large cell carcinoma (10.7 months) and adenocarcinoma other than bronchoalveolar carcinoma (ADOBAC) (10.2 months) and difference was statistically significant. In inoperable cases, survival was 4.9 months for ADOBAC, 6.5 months for large cell carcinoma, 6.8 months for squamous cell carcinoma and 12.5 months for BAC. Multivariate analysis of this study resulted that histological type was the second most important prognostic

factor, after extent of the disease and ADOBAC cases had the worst prognosis (5). Comparing 66 ADOBAC and 138 squamous cell carcinoma cases, we found no significant difference.

Surgical resection can be curative in selected NSCLC cases. However, in many instances, patients are in the advanced stage at the time of diagnosis and surgery cannot be applied. There are various studies on relationship between CT and survival in such cases. Despite extensive use of cisplatin recently, improvement in response rates to CT remain limited (9). Of 304 cases included in our analysis, 133 recieved CT and had longer survival compared to others in both univariate and multivariate analysis (9.0 ± 1.1 vs 4.0 ± 0.4). Curative RT was administered to 57 patients and they were found to have longer survival than patients recieving no or less than 50 Gy radiation (17.0 ± 4.0 vs 4.5 ± 0.3). According to Capewell et al, curative RT had a 5-year survival benefit of 15.5% (increase from 1.5% in case of palliative RT to 17%) (6). In a meta-analysis, cisplatin is reported as the single agent improving survival, compared to palliative treatment (18). Our study, however demonstrated no superiority of platinum based regimens over others. As this is a retrospective analysis and subjective opinion of the concerned physician about factors like PS or obtaining the drugs influenced the treatment regimens, it was imposibble to obtain homogeneous treatment groups. In order to make more accurate decisions about effect of treatment on survival with sufficient statistical power, randomised prospective studies are neccessary.

As a conclusion, multivariate analysis of our study demonstrated that PS (ECOG PS > 1), dyspnea, peripheral LAM and pleural effusion were poor prognostic signs and curative RT and CT administration significantly improved survival. In contrast to several similar studies, age, gender, weight loss, SVCS and distant metastases were not found to effect prognosis.

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