

Comparison of clinical characteristics and prognosis of incidentally detected and screening detected lung cancers

Sungmin Zo, Sun Hye Shin, Byeong-Ho Jeong, Kyungjong Lee, Hojoong Kim, O Jung Kwon, Sang-Won Um

Division of Pulmonary and Critical Care Medicine, Department of Medicine, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, Republic of Korea



Background

With the increasing use of the computed tomography (CT) scans, the clinicians more commonly encounter incidentally detected pulmonary nodules, parts of which are finally diagnosed as primary lung cancer during follow-up. The clinical characteristics of incidentally detected lung cancers (IDLCs) have not been well known in South Korea. In this study, we compared the clinical characteristics and prognosis of IDLC and screening detected lung cancer (SDLC).

Material and Methods

This retrospective study included the subjects with pulmonary nodules (T1, <3cm) at the baseline CT scans, which were pathologically confirmed as primary lung cancer in year 2015. The study population was classified as IDLC and SDLC according to the setting of the first pulmonary nodule detection. The symptomatic subjects at the time of the pulmonary nodule detection were excluded. Clinicoradiologic characteristics and overall survival (OS) rates were compared between the IDLC and SDLC groups.

Results

Table 1. Baseline characteristics at diagnosis

	Total (n = 457)	IDLC (n = 129)	SDLC (n = 328)	P value
Age	61.6 ± 9.1	63.1 ± 9.1	61.0 ± 9.0	0.023
Sex, male	228 (49.9)	67 (51.9)	161 (49.1)	0.656
Ever smoker*	202 (44.2)	63 (48.8)	139 (42.4)	0.251
COPD	21 (4.6)	11 (8.5)	10 (3.0)	0.023
ILD	10 (2.2)	7 (5.4)	3 (0.9)	0.009
FEV1	94.0 (84.0-104.0)	89.7 ± 17.8	94.6 ± 16.0	0.004
DLco	89.0 (80.0-101.0)	87.0 (74.5-97.0)	90.0 (81.0-102.0)	0.004
Type				0.298
Solid	242 (53.0)	74 (57.4)	168 (51.2)	
Part-Solid	120 (26.3)	34 (26.4)	86 (26.2)	
Non-Solid	95 (20.8)	21 (16.3)	74 (22.6)	
Size (mm)	20.0 (16.0-25.0)	21.0 (17.0-25.0)	20.0 (16.0-25.0)	0.093
Pathology				< 0.001
Adenocarcinoma	386 (84.5)	99 (76.7)	287 (87.5)	
Squamous cell carcinoma	33 (7.2)	16 (12.4)	17 (5.2)	
Small cell carcinoma	16 (3.5)	5 (3.9)	11 (3.4)	
Else†	22 (4.8)	9 (7.0)	13 (4.0)	

	Total (n = 457)	IDLC (n = 129)	SDLC (n = 328)	P value
Risk (NLST‡)				0.106
Low	377 (82.5)	100 (77.5)	277 (84.5)	
High	80 (17.5)	29 (22.5)	51 (15.5)	

Data are presented as number (%), mean value ± standard deviation, or median (interquartile range).
IDLC, Incidentally detected lung cancer; SDLC, Screening detected lung cancer; COPD, Chronic obstructive pulmonary disease; ILD, Interstitial lung disease;
NLST, National Lung Screening Trial;
*Includes current and former smokers
†Includes large cell carcinoma, neuroendocrine carcinoma
‡NLST criteria is defined as 55–74 years old, ≥30 pack-years of smoking and current smoking status or ex-smokers, who had quit within the previous 15 years

Table 2. TNM stage of Incidentally and Screening Detected Lung Cancer

TNM	Total (n = 457)	IDLC (n = 129)	SDLC (n = 328)	P value
I	331 (72.4)	88 (68.2)	243 (74.1)	0.375
II	48 (10.5)	18 (14.0)	30 (9.1)	
III	49 (10.7)	13 (10.1)	36 (11.0)	
IV	29 (6.3)	10 (7.8)	19 (5.8)	

Table 3. Initial treatment and Time to Treatment Initiation (TTI)

	Total (n = 457)	IDLC (n = 129)	SDLC (n = 328)	P value
Initial Treatment				0.016
Surgery	390 (85.3)	105 (81.4)	285 (86.9)	
Neoadjuvant CCRT with surgery	16 (3.5)	4 (3.1)	12 (3.7)	
Definitive CCRT	13 (2.8)	3 (2.3)	10 (3.0)	
Definitive RT	8 (1.8)	7 (5.4)	1 (0.3)	
Palliative therapy*	30 (6.5)	10 (7.8)	20 (6.1)	
Number of CT scans	2.0 (2.0-3.0)	2.0 (2.0-3.0)	2.0 (2.0-3.0)	0.210
TTI (days)	53.0 (38.0-91.0)	48.0 (35.0-97.0)	54.5 (39.0-91.0)	0.181

CCRT, Concurrent chemoradiation therapy; RT, Radiation therapy; CT, Computed tomography; TTI, Time to treatment initiation;
*Palliative therapy includes both palliative radiotherapy, chemotherapy and other palliative care for symptomatic control.

Figure 1. 5 year overall survival

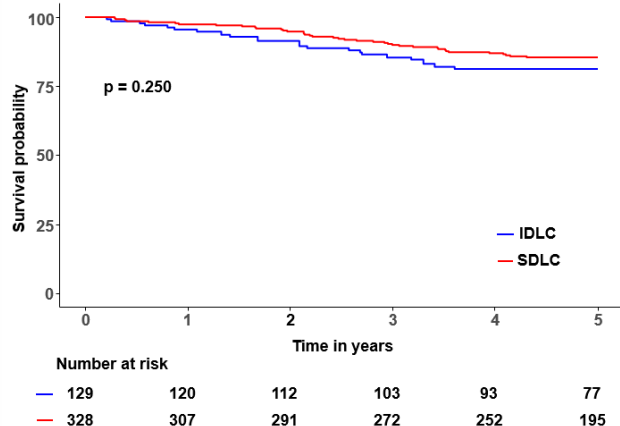


Table 4. Risk Factors for Lung cancer survival

	Total (n = 457)	IDLC (n = 129)	SDLC (n = 328)	P value
Age	1.03 (1.01-1.06)	0.014	1.02 (0.99-1.06)	0.188
Sex, male	2.53 (1.53-4.17)	< 0.001	2.09 (0.89-4.92)	0.091
Ever smoker*	2.15 (1.34-3.45)	0.002	0.66 (0.29-1.52)	0.330
COPD	1.57 (0.63-3.89)	0.334		
ILD	9.62 (4.39-21.09)	< 0.001	3.69 (1.39-9.78)	0.009
FEV1	0.97 (0.96-0.98)	< 0.001	1.02 (0.99-1.04)	0.151
DLco	0.96 (0.95-0.97)	< 0.001	0.98 (0.96-1.00)	0.012
Type				
Solid	Ref.		Ref.	
Part-Solid	0.21 (0.10-0.45)	< 0.001	0.54 (0.23-1.28)	0.161
Non-Solid	0.03 (0.00-0.24)	0.001	0.12 (0.02-0.93)	0.042
Size (mm)	1.11 (1.06-1.16)	< 0.001	1.04 (0.99-1.09)	0.100
TNM				
I	Ref.		Ref.	
II	3.76 (1.69-8.37)	0.001	1.44 (0.60-3.45)	0.420
III	14.23 (7.7-26.15)	< 0.001	10.07 (5.06-20.06)	< 0.001
IV	21.56 (11.35-40.98)	< 0.001	9.77 (4.57-20.85)	< 0.001
Diagnostic pathway		0.132		
SDLC	Ref.			
IDLC	1.45 (0.89-2.34)			

Conclusions

Among non-symptomatic lung cancer patients, the proportion of IDLC was about 28% in our cohort. The IDLC group was associated with old age, smokers, history of other malignancy, and non-adenocarcinoma histology. However, the prognosis of the IDLC group was not inferior to the SDLC group, due to similar TNM stage, strict adherence to guidelines and short time to treatment initiation (TTI). Moreover, less than a quarter of the study patients would have been eligible for lung cancer screening program, suggesting necessity to broaden the scope of screening candidates.