284. Epidemiology of lung cancer and screening

P2726

Patients with a lung cancer are changed: About a French monocentric cohort between 1990 and 2010

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Background: Authors report the analysis of monocentric cohort of 1400 patients with lung cancer followed between 01.01.1990 and 31.12.2009.

Cohort	1990–1994	1995–1999	2000–2004	2005–2009	Global
Sex ratio M/F	7.3	3.6	2.9	2.7	3.3
Median age	63	65	65	67	65
Non-smoker	4%	8%	8%	12%	8%
Adenocarcinoma	30%	39%	52%	57%	47%
Epidermoid	41%	32%	23%	19%	27%
Small cell	10%	10%	9%	8%	9%
Stage I	17%	29%	22%	22%	23%
Stage II	9%	8%	4%	4%	6%
Stage III	40%	35%	25%	24%	28%
Stage IV	32%	29%	44%	50%	40%
Dg by endoscopy	73%	60%	43%	44%	52%
Dg by punction	3%	9%	21%	21%	15%

Methods: see table.
Results: This analysis shows the increase of adenocarcinoma with increase of female patients, of non smoker-status and increase of diagnosis by TDM punction. Non small cell is stable.
Median age of diagnosis is a little bit increasing.
The increase of stage IV and the decrease of stage III is due to a best staging with the routine use of PET and RMI procedures since 2000.
Conclusion: This cohort is the largest single center in French literature. The analysis over 20 years shows epidemiological and histological changes.

P2727
Increased survival in lung cancer patients with diabetes mellitus: A large cohort study
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Background: Individualized treatment in lung cancer (LC) needs precise characterization of the tumour and host. Data on the impact of diabetes mellitus (DM), the most frequent endocrinological disorder, on the prognosis of lung cancer is conflicting.
Aim: To define the importance of DM for survival in lung cancer.
Method: We analyzed data from a large cohort study, the Nord-Trøndelag Health Study (HUNT study) linked to the Norwegian Cancer Registry, and controlled the results using two lung cancer studies, the Pemetrexed Gemcitabine study (PEG study) and the Norwegian Lung Cancer Bio Bank (NLCB). Survival rate between lung cancer patients with and without DM were compared using the Kaplan-Meier model and Cox regression analysis.
Results: Of a total number of 107 127 study participants there were 5448 persons with DM and 1877 cases of LC. Among the LC patients 85 patients had DM. LC patients with DM showed a statistically significant survival benefit compared to LC patients without DM ($p = 0.005$). The 1-year, 2-year and 3 year survival in LC patients with and without diabetes showed 43%, 19%, 3% versus 28%, 11%, 0.7%, respectively.
With the Cox regression model we adjusted survival for DM, age, gender, histology, clinical stage and smoking status. The first five confounders showed to be independent factors ($p < 0.001$), while smoking status was not ($p = 0.531$).
Conclusion: Lung cancer patients with diabetes mellitus have an increased survival compared to lung cancer patients without diabetes mellitus. The magnitude of the survival benefit seems to be of clinical importance and therefore justified to be studied more in detail.

P2728
Lung cancer in patients with COPD: Incidence and predicting factors
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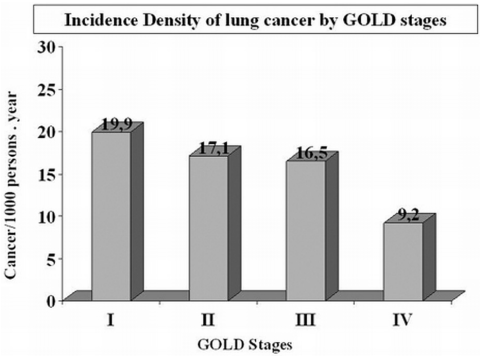
Background: Little is known about the clinical factors associated with development of lung cancer in patients with Chronic Obstructive Pulmonary Disease (COPD).



Objective: To explore incidence, histological type and factors associated with development of lung cancer diagnosis in a cohort of patients with COPD.
Methods: A cohort of 2507 patients without initial clinical or radiological evidence of lung cancer was followed for 62±38 months. At baseline, anthropometrics, smoking history, lung function and body composition were recorded. Time to diagnosis and histological type of lung cancer was then registered. Multivariate Cox analysis were used to explore factors associated with lung cancer diagnosis.
Results: Incidence density of lung cancer was 16.7 cases/1000 person-years. The most frequent histological type was squamous cell carcinoma (44%).

Parameter	Hazard Ratio	95% CI	p value
Age	1.02	1.00-1.04	0.029
DLCO<80% predicted	1.76	1.15-2.69	0.009
BMI	0.95	0.92-0.99	0.011
GOLD stage			
I	3.05	1.41-6.59	0.005
II	2.06	1.01-4.18	0.044
III	1.67	0.81-3.44	0.159
IV	Reference		

Variables included in the model: age, BMI, pack-year history, smoking status, GOLD stages, DLCO<80% and IC/TLC<0.25.

Conclusions: Incidence density of lung cancer is high in COPD patients and occurs more frequently in older patients with milder airflow obstruction (GOLD stages I and II), a DLCO <80% and lower BMI. Knowledge of these factors may help direct efforts for early detection of lung cancer and disease management.

P2729
COPD prevalence in lung cancer patients – Is COPD a risk factor for lung cancer?
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Background and aim: Chronic obstructive pulmonary disease (COPD) is a common comorbid disease in lung cancer, estimated to affect 40–70% of lung cancer patients. As smoking exposure is found in 85–90% of those diagnosed with either COPD or lung cancer, coexisting disease could reflect a shared smoking exposure. We aimed to investigate the prevalence of COPD in patients diagnosed with lung cancer.
Methods: We analysed 1173 patients diagnosed with lung cancer in Internal Medicine Department between 2000 and 2010 for the presence of lung cancer risk factors.
Results: A number of 1046 patients (89.17%; p<0.0001) were former smokers/actively smoking. Preexisting disease was diagnosed in a number of 442 cases (37.68%): COPD in 257 cases, and other etiologic factors in 185 cases (58.14% versus 41.85%; p<0.0001). Histopathological results were avaible in 131 cases and showed: scuamos carcinoma (n=78; 59.54%), adenocarcinoma (n=24; 18.32%), large cell undifferentiated carcinoma (n=11; 8.39%), and small cell carcinoma (n=18; 13.74%). Smokers versus non-smokers and COPD prevalence according to histopathologic types were the following: 71 versus 7 (p<0.0001), and 14 cases of COPD (17.94%) for scuamos carcinoma; 15 versus 9 (p=0.1482), and 2 cases of COPD (13.33%) for adenocarcinoma; 8 versus 3 (p=0.0861), and 1 case of COPD (9.09%) for large cell undifferentiated carcinoma; and 14 versus 4 (p=0.0022), and 3 cases of COPD (16.66%) for small cell carcinoma.
Conclusions: Our study shows a high prevalence of COPD in lung cancer patients. COPD was the second most important risk factor for lung cancer, after smoking. The most important relationship of COPD was with the scuamos type lung cancer.

P2730
Pecularities of lung cancer in patients with COPD
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The aim of the study was to determine main causes of mistakes in radiologic diagnose of lung cancer in patients with COPD. We examined 201 patients with moderate and severe COPD admitted to hospital during exacerbation. All patients were examined by MDCT angiography interpreted by two experienced radiologists, also previous CT scans were compared with the acquired data.
We founded cancer of main bronchi in 15,3% of patients with severe, and in 8,6% of patients with moderate COPD. Peripheral lesions were observed in 17,9% of patients with severe and 5,5% of patients with moderate COPD with significant interobserver consensus. During analysis of earlier CT examinations (a 5 year period) in 1,9% central cancer was not determined on early stage of disease, because study was performed without contrast enchancement. Peripheral neoplasms were not determined because of peribullous growth, looking like thickening of the wall

of bulla in 1.4% of patients, cancer growing in the place of fibrosis - 0,4%, fluid of different genesis in bullas in 1.4% of patients. Interobserver consensus was significant in determination of lesions on previous scans. We observed a group of patients after lung volume reduction surgery who were thoughtfully examined before the treatment and who than developed different types of cancer in a short period after the surgery. No evidence of malignancy was founded on previous scans, so we can only speculate that surgery and changes in circulation were triggering mechanisms in the extraordinary quick development of tumors.
Thus we can suppose that in patients with COPD contrast enchancement is strongly recommended for early diagnose of tumors, and patients after LVRS should be examined by CT after surgery.

P2731
Epidemiological and histologic features of lung cancer in Montenegro
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Background: Lung cancer is one of the most common malignant neoplasms as well as the most common neoplasm stated as a cause of death. Epidemiological characteristics of lung cancer differ among countries and regions.
Aim: To determine the epidemiological and histologic features of lung cancer in Montenegro.
Methods: Study group comprised patients in Montenegro in continuous period 1997-2010.
Results: In reported period number of newly diagnosed lung cancer is 2497. The incidence ranged from 29.8 in 1997 to 35.9 in 2004. Out of the total number of diagnosed lung cancer, epidermoid carcinoma was diagnosed in 1484 cases (59.41%), small cell lung carcinoma (SCLC) in 597 cases (23.92%) and adenocarcinoma in 416 cases (16.65%). The men were represented with 83.17% (2078) while the female were 16.83% (419). Ratio of smokers and nonsmokers for each histological type was (epidermoid 8:1, 2,15:1 adenocarcinoma, SCLC 9:1). The most common age group in which there was a cancer for both men and female was 60-69 years (35.88%), followed by 70-79 (27.75%) and 50-59 (24.74%). The most frequent histopathological type in males was epidermoid (63%) followed by adenocarcinoma (14.5%) and then SCLC (22.5%). In women the most common cancer was epidemoid (43.5%). Adenocarcinoma accounts for 26.5% and SCLC with 30%. The percentage of smokers was 88.72%, nonsmokers represented 11.28%.
Conclusion: During the period 1997-2010 a significant increase in the incidence of diseases such as lung cancer was not observed, but the decrease in the frequency of epidermoid carcinoma was noted - from 75% (1997) to 50% (2010) as well as the increased frequency of SCLC from 17% (1997) to 30% (2010) and adenocarcinoma from 13% (1997) to 28% (2010).

P2732
Occupational exposure to carcinogens and lung cancer: Impact of a dedicated professional disease consultation in a Belgian oncologic centre
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Introduction: In epidemiological studies, 15% of lung cancers in men and 5% in women are linked to occupational exposure to carcinogens. However, there is a clear under-reporting of occupational lung cancer in Belgium: in 2006, only 67 cases were recognized by the Professional Disease Fund whereas 500 were attended.
Aim: To appreciate the frequency of occupational lung cancer in newly diagnosed lung cancer in a Belgian oncologic hospital.
Material and method: Since 01/09/2009, all new patients with lung cancer were sent to a dedicated consultation where a physician trained in professional disease asked information about job history and look for known or suspected lung carcinogenic exposure.
Results: 73 job stories have been recorded, 23 patients (32%) were certainly or probably exposed to a lung carcinogenic agent (known or suspected). All the patients were men (mean age 62 years), 22 workmen, 21 were smokers. Asbestos was the most common carcinogenic agent found (25%). Ten claims for occupational disease were made; 3 recognized and 7 are pending.
Conclusion: This study shows the utility of a physician with knowledge in occupational pathology into a clinical department to reduce the under-reporting of occupational primary lung cancer and then to ensure that the victims receive the appropriate medico-legal benefits.

P2733
The association between residential radon concentration and lung cancer
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Lung cancer represents the most frequent cause of mortality caused by malignancies in the world. Radon (Rn), the second recognized carcinogenic agent involved in the development of lung cancer, after smoking, is a noble gas with a high mobility. The aim of this study was to investigate the correlation between the exposure to radon and lung cancer in patients from the centre counties of Transilvania, Romania.
Material and method: We conducted a case-control study, by location of 204 Rn detectors in 78 patients with lung cancer and 126 controls from the centre counties of Transilvania.
Results: From 78 cases 87% were men, 13% were women, from 126 controls 57% were men, 43% women, 38% of cases were from urban area and 62% from rural area, 39% from controls were from urban area and 61% from rural area, the age average in cases was 65±11 and in controls 57±15, in cases 33% were with a family history of cancer and 13% were in controls. We observed that the magnitude of Rn exposure for cases was 139 Bq/m^3 (average) minimum 9 Bq/m^3, maximum 750 Bq/m^3, geometric mean was 102 Bq/m^3. The average for controls was 125 Bq/m^3, minimum 9 Bq/m^3, maximum 740 Bq/m^3, geometric mean was 80 Bq/m^3.
Conclusions: The Rn concentrations are higher in patients with lung cancer compared with controls. This findings support the implication of Rn in developing lung cancer and the high level of Rn in studied area.

P2734
Is female gender a protective factor for NSCLC patients? A follow up study of 20 years of 478 patients
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Background: Previous studies reported a better survival rate among females with non-small lung cancer (NSCLC). We have previoulsy also registereed similar findings. The purpose of this study was to re-evaluate female gender as a protective factor survival in a cohort of patients with NSCLC in a follow up study of 20 years.
Methods: In a retrospective cohort study, we examined the survival rates of 478 NSCLC patients who underwent surgical curative treatment at Hospital da PUCRS, in Porto Alegre, Brazil between January 1990 and December 2009. Survival rates were analyzed by Kaplan-Meier plots and by the log rank test. Cox proportional hazards analyses were performed to identify potential confounding factors. The statistical significance was considered as P=0.05.
Results: The 5-year survival rate was 55.6% for women and 38.8% for men (P=0,005), when considering the whole group of patients. After adjustment for possible confounding factors (age, TNM stage, histology, tumor size, surgical procedure, smoking load, hemoglobin, and postoperative complications), female gender protective effect persisted only for stage I (survival rates: 75.2% and 47.9%, for women and men, respectively; P=0.007). For subjects in stages ≥II, no significant differences in 5-years survival rates were found. The hazard ratio for males in stage I was 1.95 (95%CI: 1.16 to 3.27, P=0.012), when compared to females.
Conclusion: In this 20 years of follow up study, female gender was a protective factor for mortality in patients with NSCLC submitted to surgery with curative intent in stage I when compared to males. This effect is not observed in patients in stage ≥II.

P2735
A retrospective study of lung cancer in young patients
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Introduction: Over-representation of women, more advanced disease staging at presentation, better performance status and similar survival figures have been noticed in younger (≤50 years) lung cancer patients as compared to the general patient population with the disease.
Objective: A retrospective study (February 2010) was done to derive clinicopathological data from young lung cancer patients treated in our hospital in the last 5 years. We also compared our findings with National Lung Cancer Audit (NLCA), 2007 in the UK. The NLCA data were considered as a reflector of the patients from all age groups.
Findings: 36 patients were identified for the study. Median age was 47 (37-50). 19 (54%) were female. 76% had WHO performance status (PS)1 in patients with documented PS. 43% had family history of lung cancer. 89% were current smoker. Histology was achieved in 87%. 68% had non small cell carcinoma (NSCLC) including 40% adeno carcinoma, 24% had small cell carcinoma; 3 had carcinoid. 55% of histology proven NSCLC had stage 4 disease at presentation. 86% had some form of treatment (surgery, chemotherapy or radiotherapy). 6 (18%) had resection.

NLCA & Local Data Comparison

Male:Female	1.4:1	0.84:1
Histology	68%	87%
Stage 4 at Presentation	32%	53%
Active Treatment Received	51%	87%
Resection in NSCLC	14%	18%
Median NSCLC survival	232	246

Conclusion: Majority of these patients presented with advanced stage disease as in previously reported larger cohorts. Women were a majority but they had a better survival than men. 41% had positive family history suggesting a possible genetic factor. Favourable performance status resulted in higher resection rate and active treatment compared to overall patient population. But did not lead to better survival.

P2736

KRAS mutations in non-small cell lung cancer (NSCLC) – Experiences by routine molecular testing in a German lung cancer centre

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Introduction: More than 20 years ago KRAS mutations were identified but the utility of this information remains vague. Several clinical studies indicate that KRAS mutations are associated with shorter overall survival (OS) in preselected populations. With the routine testing of KRAS mutation in all newly diagnosed NSCLC in our clinic for 14 months, we offer a new perspective.
Methods: From Nov 2009 until Dec 2010, all subsequent biopsies of newly diagnosed NSCLC (n=753) obtained by surgery, routine bronchoscopy or CT guided biopsy were tested for the ability to be analysed by LightCycler Real-time PCR accessing codons 12 and 13 for the presence of KRAS mutations. The obtained data were correlated with the centre-bound tumour registry for survival data.
Results: A total of 504 cases with NSCLC, 229 adenocarcinoma (AC), 163 squamous cell carcinoma (SCC) and 112 with other NSCLC were eligible for analysis. Among those, KRAS mutation was present in 79/504 cases (15,7%, male, n=39). The highest frequency of KRAS mutation was observed in AC 61/229 (27%). Patients with SCC (6/163, 3,7%) and other NSCLC (12/112, 11%) showed KRAS mutations less often ($p < 0.001$). By analysing EGFR mutations in the same population, we detected only one KRAS positive patient with a simultaneous EGFR mutation. By now we did not find a significant difference in OS expressed as mean ± SEM (KRAS negative 378±9 vs KRAS positive 406±20, $p = 0.244$).
Conclusion: The frequency of KRAS mutations in NSCLC in our unselected cohort is comparable with previous reports. They are more frequent in AC compared to other histologic subtypes. To date we could not confirm any association with OS.

P2737

Characterization of patients with non-small cell lung cancer (NSCLC) relative to its EGFR mutational status

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Introduction: EGFR (Epidermal Growth Factor Receptor) mutations occur in 10-15% of non-Asian patients with NSCLC. In 2010, our Lung Cancer Centre started performing this sequencing systematically in all patients with NSCLC, regardless of histology, smoking or sex.
Objective: Characterize the group of patients that undertook EGFR sequencing in the year 2010 and assess their frequency.
Methods: Descriptive statistical analysis of patients with NSCLC who did EGFR sequencing in 2010.
Results: The sequencing was performed on 126 patients, 75% males and 25% females. Average age 65 years. 69% non or ex-smokers and 31% smokers. Histology: 59%adenocarcinoma, 23%squamous cell carcinoma (SCC). Mutations were detected in 13 patients (10.3%), one mutation in exon18, 6 in exon19, 2 in exon20, 4 in exon21 and no resistance mutations were described.The mutation rate was higher in females (53%), non-smokers (46%) and adenocarcinoma (62%). Female patients with EGFR mutation: 86%nonsmokers, 85%adenocarcinoma, 15%epidermoid histology. Male with EGFR mutation: 83%ex-smokers, 67%SCC, 33%adenocarcinoma. Non-smoker mutated patients were all female, 83%adenocarcinoma, 17%SCC.
Conclusion: Our group had a mutation rate of 10.3%, predominantly female, non-smokers, adenocarcinoma histology, accordingly with literature. This work also intends to highlight the importance of sequencing EGFR gene mutation in all patients with NSCLC, whereas mutation is also frequent in males, squamous histology and smokers. These patients are given the possibility of a 1st line treatment in the with TK inhibitors, with a greater increase in survival, improved quality of life and a better chance for other courses of chemotherapy.

P2738

Analysis of EGFR-mutations in a diverse urban patient population

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Background: EGFR-mutations are predictive for EGFR-TKIs in advanced NSCLC; however, not all pts are screened for these mutations. Clinical criteria (female, never-smoker, East-Asian, adeno-ca) are often used to select pts, however the impact of country of origin in non-East Asians has not yet been described. We analysed EGFR-mutation and country of origin in NSCLC pts treated at a university hospital in Munich.
Methods: We retrospectively identified all pts treated for primary thoracic malignancy on the ward in 3 months and conducted a chart review. Specimens were analysed for activating mutations in exons 18, 19, 21, using nested PCR together with tailed primers (bidirectional didesoxi-sequencing applying the tail-sequences as sequencing primers on a Genetic Analyzer 3130 platform - Applied Biosystems).
Results: From Oct to Dec 2009, 62 pts with thoracic malignancies (NSCLC 52, SCLC 7, carcinoid 1, mesothelioma 2) were treated. Country of origin: Ethiopia 1, Mongolia 1, Italy 2, Spain 1, Russia 1, Croatia 4 (6.5%), Turkey 9 (14.5%), Germany 43 (69.4%). Subtypes of NSCLC: adeno 48.1, large cell 3.8, squamous 40.4, NOS 7.7%. 53 samples are analyzed, and revealed 4 activating mutations and one pt with silent mutations in exon 18 and 20. Activating mutations were found in 3/43 (7%) Germans (including a heavy smoker with squamous cell ca, 1 adeno, 1 large cell), 1/9 (11%) Turks and 2 silent mutations were found in 1/4 Croatians (adeno).
Discussion: Regional mutational heterogeneity occurs in various illnesses. In NSCLC this affects the generalisability of study data. In this first analysis we describe the diverse nature of a patient population in Munich, and show similar rates of activating EGFR mutation in all subgroups.

P2740

In lung cancer screening by CT incidental findings are frequent and often of clinical importance

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Introduction: Incidental findings during CT screening of a large population may cause a substantial burden of additional diagnostic workup and the patients may undergo unnecessary and potentially harmful procedures.
Aim: We investigated the extent of significant incidental findings during five years of CT screening for lung cancer in the Danish Lung Cancer Screening Trial (DLCST).
Material and methods: DLCST recruited 4,104 healthy current and former smokers (age: 50-70), who were randomised to either five annual chest CT or no intervention. CT Scans were performed supine after full inspiration with caudocranial scan direction including the entire ribcage and upper abdomen with a low dose technique. Two experienced chest radiologists read all CT scans and registered lung nodules as well as incidental findings. Findings were discussed at weekly consultations, and clinical significant findings were defined as referral to relevant departments for futher workup, where we followed participants closely by their medical records.
Results: 140 participants (7%) had 148 clinical significant incidental findings localised in larynx (1), thyreoid (3) gastro-esophageal (9), breast (16), cardiac (5), mediastinum (12), aorta (28), liver-and-gall-bladder (18), pancreas (6), spleen (1), intestines (2), kidneys (40), skin (2), chest-wall (3) and vertebral column (2). 22 (16%) underwent invasive procedures that lead to a cancer diagnosis in 10 participants. 118 had one or more non-invasive clinical check-ups.
Conclusion: The extent of incidental findings during CT screening of lung cancer is considerable and may lead to diagnosis of clinical significant diseases.

P2741

Evaluation of the effect of sampling of spontaneous sputum over a prolonged period on the sensitivity for lung cancer

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Introduction: Lung cancer is the most common fatal cancer worldwide with an average 5-year survival of 12%. To reduce lung cancer mortality, spiral CT screening is promising, although this is costly and has a high false-positivity rate. Therefore, a clear need exists for alternative screening assays, like sputum-based DNA methylation detection. This study was set out to determine whether the detection rate of RASSF1A hypermethylation is influenced by duration of sputum collection.
Methods: Sputum samples were prospectively collected from 51 lung cancer and 50 controls. Controls are patients with COPD. Spontaneous sputum was collected at home during nine consecutive days in three canisters. DNA was isolated and bisulphite treated. Subsequently, quantitative methylation-specific PCR (qMSP) was performed to assess methylation status of the RASSF1A gene promoter. All samples were tested in duplicate. Statistical analyses were conducted using chi-square tests.
Results: Analysis of each canister separately showed RASSF1A methylation in samples of day 1-3, 4-6, and 6-9 in 29%, 35%, and 33% of cases, respectively.

These figures were significantly lower for control samples, i.e., 2%, 6%, and 2%, respectively (all P-values <0.001). Cumulative analysis of RASSF1A methylation, i.e., combining methylation positivity outcomes for day 1-6, and day 1-9, revealed RASSF1A methylation in 39% and 47% of cases, respectively, versus 8% and 8% of controls, respectively.
Conclusion: Our study suggests that sputum collected over multiple successive days results in a gain in sensitivity, at the expense of a small loss in specificity, for the detection of lung cancer.

P2742
Molecular test supporting early lung cancer detection project based on pilot Pomeranian lung cancer screening program
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Introduction: Lung cancer is one of the most common malignant neoplasms worldwide. Only 10% of patients can be cured, mostly due to late diagnosis and high aggressiveness of lung cancer.
Aim: Aim of the Molecular Test Supporting Early Detection of Lung Cancer Project is to perform genetic studies and serum protein studies in order to increase the efficacy of radiological examinations in early lung cancer screening and to define population of particularly high risk of lung cancer development. The project consists of five thematic areas.
Results: Pomeranian Pilot Early Detection Program has been realized from the 17th November 2008. In this project 8000 healthy subjects with high risk of developing lung cancer (age 50-75, at least 20 pack-years) were screened with low-dose CT scanning of the lungs. As a co-project blood samples were taken from those patients who gave informed consent. In the first year of project realization 6836 healthy subjects were screened. In above a half of the cases (53%) at least one pathological alteration in lung tissue was found. Among 186 patients, in whom the lesion was above 1 cm in diameter, in 56 cases lung cancer was diagnosed. Almost 60% of lung cancer cases were in stage IA.
Conclusions: Pomeranian Pilot Lung Cancer Screening Program and Molecular Test Supporting Early Lung Cancer Screening Project - Moltest 2013 are dedicated to define population of particularly high risk of lung cancer development.

P2743
Current screening programs for lung cancer – Are inclusion criteria too rigorous to identify asymptomatic patients?
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Background: Preliminary results from the controlled National Lung Cancer Screening Trial (NLST) indicates a mortality reduction of > 20% in screened patients; high risk being defined as smokers (ex/current) > 55 years old with > 30 pack-years. Recent studies suggest that female smokers develop lung cancer at a younger age and following smaller amounts of tobacco consumption than males. In industrialized countries the incidence of lung cancer is falling in males, but increasing in females. We aimed to assess if the inclusion criteria used in NLST would have identified lung cancer in a cohort of asymptomatic subjects who underwent surgical resections at our tertiary university hospital.
Material and methods: During the period 2002-10 clinical data from 1043 consecutive patients with lung cancer were prospectively registered. 626 patients (294 (47%) females, mean age 68 years, and 332 (53%) males, mean age 64 years), underwent surgery.
Results: Of the 626 patients who underwent surgery, 267 (42%, 131 females, 136 males) had no clinical manifestations of lung disease at presentation, and chest x-rays had been performed for co-incidental conditions. In females, 30/131 (23%) were current or ex-smokers with > 30 pack-years. In males, the corresponding proportion was 65/136 (48%). Applying the NLST criteria, 77% of the females and 52% of the males would not have been admitted to the screening program.
Conclusion: Less than one forth of asymptomatic females who underwent resection for lung cancer would have been included in NLST as their total consumption of tobacco in pack-years was too low. Also, half of symptom-free resected males would have been excluded from screening.

P2744
A study of design an original questionnaire for evaluating risks of lung cancer
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Background: No simlpe questionnaire has been published, though risk factors of lung cancer were studied for long.
Objective: To explore a questionnaire for people self-evaluating.
Methods: A questionnaire was designed and applied to test its value.
Results: See Table 1. Coefficient of reliability and validity were 0.99 and 0.59. Difference of scores between 94 patients and 252 controls confirmed its differentiating power. Threshold (116) was identified by a survey including 2161 individuals. Then, 7697 volunteers completed a 3-year prospective study, and 16 lung cancer were detected in the risk group with 1257 persons (1.28%), while another 4 in the non-risk cohort (0.06%).
Conclusion: The questionnaire is a useful method for self-evaluation.

Table 1. Self-evaluation scoring questionnaire for high-risk individuals of lung cancer

Risk Factors	Classification	Risk Assignments	Scores
Sex	Male	7	
	Female	0	
Age / Years	<40	0	
	40–60	19	
	>60	42	
Average Daily Cigarette Consumption / Cigarettes per day	1–10	15	
	11–20	44	
	21–40	54	
	>40	72	
Smoking Duration / Years	<20	5	
	20–40	43	
	>40	70	
Initial Smoking Age / Years	≤15	100	
	>15	32	
Female Passive Smoking / Passive Smoking Smoking Cigarettes per day * Years	1–199	0	
	200–299	25	
	≥300	53	
Organ Transplantation	Yes	36	
Connective Tissue Diseases	Yes	44	
Chronic Pulmonary Diseases	Tuberculosis	14	
	Chronic Bronchitis	15	
	Emphysema	37	
Exposure to Cooking Fume / Plates per day * Years	≤150	0	
	≥151	36	
Years for Working as a Miner	<10	21	
	10–25	25	
	>25	36	
Exposure to Asbestos / Years	<20	5	
	20–29	21	
	≥30	47	
Depression	Usually	37	
Family History of Lung Cancer	Yes	13	
Family History of Non-lung Cancer Tumors	Yes	3	
Total			

P2745
Effects of the self-evaluation scoring questionnaire and chest digital radiography in lung cancer screening: A three-year follow-up study
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Background: To assess whether the Self-evaluation Scoring Questionnaire for High-risk Individuals of Lung Cancer combined with chest digital radiography (DR) examinations could detect early lung cancer effectively.
Methods: Subjects with scores over 116 points were regarded as high-risk individuals and underwent DR scans a year from 2007 to 2009. Noncalcified nodules with a diameter over 30 mm, along with enlarged pulmonary hilus and atelectasis, were considered to be positive and subjected to further special examinations. Efficacy of screening protocol was estimated by the 3-year's results.
Results: Among 1,537 subjects, 13, 11 and 7 ones were diagnosed with lung cancer in the first, second and third year respectively, indicating the detection rate of 2.02% (31/1,537). In addition, 77.42% (24/31) of the patients were in stage I.

Characteristics	2007	2008	2009
Participants	1537	1493	1441
Individuals losing from the study	0	31	41
Compliance rate	100%	97.97%	97.23%
Participants with nodules	230	291	394
Proportions of participants with nodules	14.96%	19.49%	27.34%
Total number of nodules	494	553	637
Participants with positive results	34	46	55
Proportions of positive results	2.21%	3.08%	3.82%
Detected lung cancers	11	10	7
Detection rates of lung cancer	0.72%	0.67%	0.49%
Interval lung cancers	2	1	0
Total number of lung cancers	13	11	7
Sensitivity	84.62%	90.91%	100.00%
Specificity	98.49%	97.57%	96.65%
False negative rate	15.38%	9.09%	0.00%
False positive rate	1.51%	2.43%	3.35%
Positive predicted value	1.92%	1.29%	1.03%
Negative predicted	99.99%	99.99%	99.99%

Conclusions: The questionnaire combined with DR scans is a effective approach to detect early stage of lung cancer.