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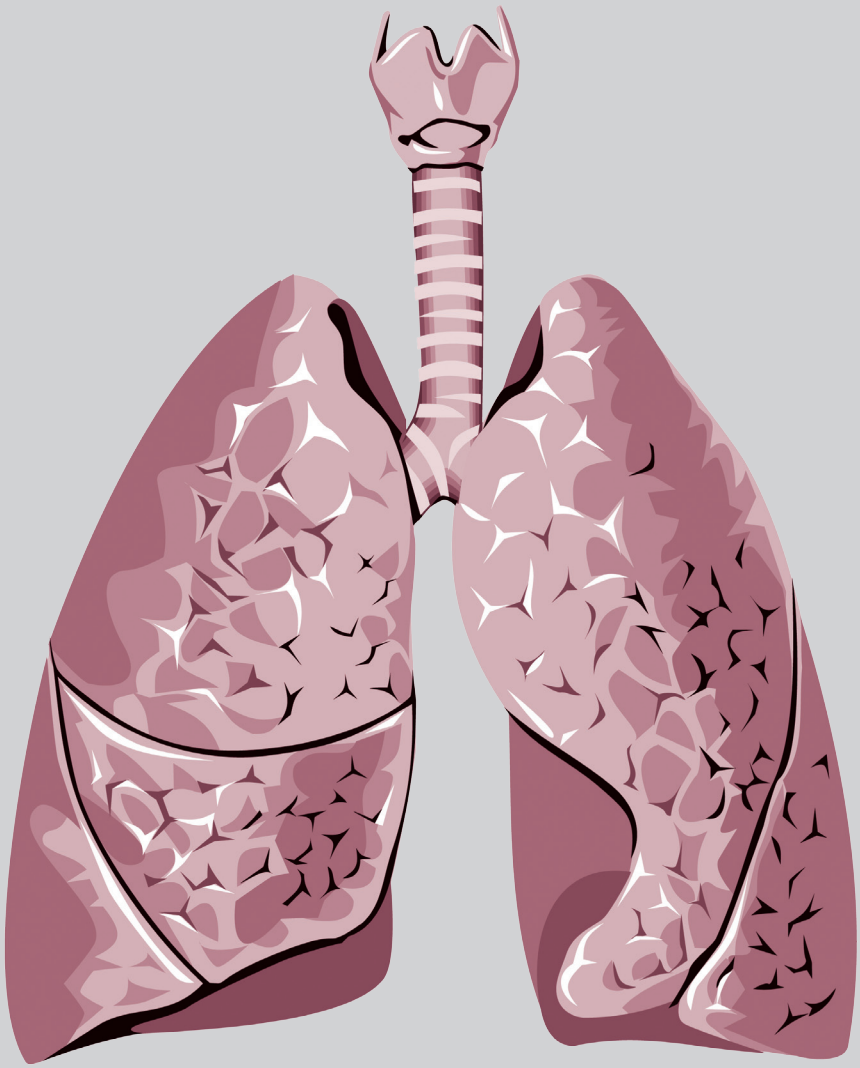

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Different Phenotypes of Respiratory Muscle Strength Influence Exercise Capacity and Health-Related Quality of Life in COPD Patients

Hsiang-Yu Huang[1], Po-Chun Hsieh[2], Mei-Chen Yang[3,4], I-Shiang Tzeng[5], Yao-Kuang Wu[2,3], Chou-Chin Lan[2,3]

Objective: The respiratory muscles are the force that drives respiration. Different phenotypes of respiratory muscle strength (RMS) can have an effect on chronic obstructive pulmonary disease (COPD). However, the effects of phenotypes of RMS on exercise capacity and health-related quality of life (HRQL) are unclear.

Methods: TA total of 85 subjects with stable COPD were included over a 2-year period and comprehensively evaluated by an RMS test, spirometry, cardio-pulmonary exercise test, and St. George's Respiratory Questionnaire (SGRQ). If the maximum inspiratory pressure (MIP) and maximum expiratory pressure (MEP) of the subjects were lower than the cut-off value, this was defined as inspiratory or expiratory muscle weakness. Patients were divided into 4 different phenotypes: type I with normal RMS, type II with inspiratory muscle weakness, type III with expiratory muscle weakness, and type IV with both inspiratory and expiratory muscle weakness. We compared the parameters of exercise capacity, HRQL, and lung function among these phenotypes.

Results: Sixty-one subjects were type I (MIP 74.2±21.8 cmH_2O; MEP 123.2±31.8), 6 were type II (MIP 30.8±4.4 cmH_2O; MEP 96.8±22.9), 10 were type III (MIP 52.8±24.9 cmH_2O; MEP 62.1±8.9 cmH_2O), and 8 were type IV (MIP 32.8±8.1 cmH_2O; MEP 57.9±20.7 cmH_2O). Type IV subjects had the lowest tidal volume (494.2±127.3 ml, $p = 0.002$), highest respiratory rate (27.5±11.4 breaths/min, $p < 0.001$), highest degree of dyspnea, poorest SGRQ and lowest exercise capacity.

Conclusion: RMS is an important factor in dyspnea, exercise capacity and HRQL. Subjects with inspiratory and respiratory failure had more dyspnea, poor exercise capacity and poor HRQL. Health care providers need to be aware of COPD patients with respiratory muscle weakness and carry out early intervention for them. ***(Thorac Med 2021; 36: 1-11)***

Key words: chronic obstructive pulmonary disease; respiratory muscle strength; exercise capacity; health-related quality of life

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Durable Ceritinib Response in Stage IV Lung Adenocarcinoma Patients Harboring the Anaplastic Lymphoma Kinase Fusion Gene: Long Term Follow-up in a Tertiary Care Medical Center

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Introduction: Advanced-stage lung adenocarcinoma patients harboring the anaplastic lymphoma kinase (ALK) fusion gene show a good response to ALK tyrosine kinase inhibitors (TKIs). Ceritinib, the first FDA-approved second-generation ALK TKI, has shown potent effects in clinical trials. Here, we evaluated the long-term clinical outcomes of patients treated with ceritinib.

Methods: We retrospectively reviewed patients who started ceritinib treatment between April 2013 and August 2017. The medical records and diagnostic images of the patients, as well as the local treatment methods, were retrospectively reviewed.

Results: Overall, 23 patients were included and a response rate of 74% was observed. With a median follow-up of 42.1 months, the median progression-free survival was 15 months (95% confidence interval, 11.6-19.5), and median overall survival had not been reached by July 31, 2019. Twelve patients (52.2%) received ceritinib beyond progression, with 8 receiving additional local treatment upon disease progression. Treatment duration after progression ranged between 2.7 and 65.5 months, with a median of 31.4 months.

Conclusion: Ceritinib is well tolerated in clinical settings. Patients with advanced-stage lung adenocarcinoma harboring ALK mutations could achieve favorable long-term outcomes through multimodality treatment. ***(Thorac Med 2021; 36: 12-17)***

Key words: lung adenocarcinoma, anaplastic lymphoma kinase, ceritinib

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Risk Factors for 5-year Mortality in Patients Hospitalized with Congestive Heart Failure and Chronic Obstructive Pulmonary Disease

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Introduction: Heart failure (HF) is often comorbid with chronic obstructive pulmonary disease (COPD), which leads to more complex clinical management and a worse outcome. This study aimed to measure the prevalence of COPD in hospitalized HF patients using standard diagnostic criteria. The impact of COPD illness severity and medications on long-term outcomes of these patients were also investigated.

Methods: Patients hospitalized due to HF with a reduced ejection fraction (HFrEF) in a tertiary medical center were retrospectively recruited. The clinical outcomes, including length of hospital stay, mortality and readmission episodes, were examined and traced for 5 years. The risk factors for mortality were analyzed using multivariate analysis.

Results: The study retrospectively recruited 138 hospitalized patients with HFrEF. Sixty-eight of the patients were comorbid with COPD and 70 were not. A male predominance (88.2% vs 67.1%, p=0.003) and smoking history (87.9% vs 48.6%, p<0.001) were significant in the HF with COPD group. The left ventricular ejection fraction was decreased (mean 29.5% vs 32.6%, p=0.01) in HF patients with COPD compared to those without COPD. There was an increased length of hospital stay in the HF with COPD group compared to those without COPD (21.5±19.7 vs. 15.1±11.2, days; p=0.009). All-cause mortality and readmission were similar between the 2 groups. Multivariate analysis showed that the use of angiotensin receptor blockers (HR 0.375, 95% CI 0.150- 0.939, p=0.036) independently predicted 5-year survival.

Conclusion: The presence of COPD in HFrEF patients was associated with a prolonged length of hospital stay. Using guideline-recommended medications to treat patients with HFrEF combined with COPD plays an important role in their long-term outcome. ***(Thorac Med 2021; 36: 18-27)***

Key words: heart failure, COPD, mortality

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Performance of Xpert MTB/RIF Assay for Detection of Mycobacterium Tuberculosis in Respiratory Specimens and Its Effect on Reducing TB Diagnosis Delay: A Single Center Experience

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Background: Xpert MTB/RIF (GeneXpert MTB/RIF) assay is a point-of-care nucleic acid amplification test (NAAT) endorsed by the World Health Organization for rapid detection of *Mycobacterium tuberculosis* (MTB) from respiratory specimens. Studies regarding its performance and impact on tuberculosis (TB) diagnosis in Taiwan remain limited.

Methods: This was a single-center study conducted in northern Taiwan. Patients with suspected pulmonary TB and who had respiratory specimens examined by Xpert MTB/RIF from January 2016 to July 2020 were recruited. We evaluated the performance of Xpert MTB/RIF using the culture method as a reference. The results of conventional MTB NAAT (Cobas TaqMan) were also recorded and compared.

Results: A total of 102 patients were recruited. Among them, 23 were positive using MTB culture and 20 were positive using acid-fast stain. The sensitivity and specificity of Xpert MTB/RIF were 91.3% (21/23) and 100% (79/79), respectively. Cobas TaqMan was also performed for 51 patients, with a sensitivity and specificity of 66.7% (8/12) and 100% (39/39), respectively. Use of Xpert MTB/RIF reduced TB diagnosis delay by 2 days compared to traditional stain and culture methods. Among the 8 patients with smear-negative TB, the median time to MTB culture positivity was 26.5 days (total=219 days).

Conclusion: Xpert MTB/RIF is a sensitive and specific point-of-care diagnosis kit for MTB detection in respiratory specimens, and helps reduce TB diagnosis delay. ***(Thorac Med 2021; 36: 28-34)***

Key words: diagnosis delay, *Mycobacterium tuberculosis*, nucleic acid amplification test, real-time polymerase chain reaction, Xpert MTB/RIF

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Squamous Cell Carcinoma Transformation after Acquired Resistance to Osimertinib in a Patient with EGFR-Mutant Lung Adenocarcinoma-Case Report

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Lung adenocarcinoma patients with epidermal growth factor receptor (*EGFR)* mutation usually respond well to EGFR-tyrosine kinase inhibitors (EGFR-TKIs) initially. However, drug resistance will develop eventually. Replacement of threonine by methionine at amino acid position 790 (T790M) at exon 20 of EGFR is the major mechanism of resistance to first- and second-generation EGFR-TKIs, and osimertinib, a third generation EGFR-TKI, can overcome the resistance. Although osimertinib shows an excellent clinical effect in non-small cell lung cancer patients with an EGFR T790M mutation, there are many mechanisms of acquired resistance to it [1]. The point mutation of C797S in exon 20 of EGFR, activating bypass pathways such as MET gene amplification, downstream target activations such as KRAS mutation, PIK3CA mutation, and BRAF mutation, and histologic transformations such as epithelial-to-mesenchymal transition or small cell lung cancer transformation, induce resistance to EGFR inhibitors. We describe a rare occurrence of lung adenocarcinoma with a secondary T790M resistance mutation that transformed into squamous cell carcinoma after acquiring resistance to osimertinib. ***(Thorac Med 2021; 36: 35-40)***

Key words: lung adenocarcinoma, EGFR, squamous cell carcinoma transformation

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Transbronchial Lung Cryobiopsy for Diagnosis of Cytomegalovirus Pneumonia in an Immunocompromised Patient: A Case Report

Shih-Yu Chen[1], Ching-Kai Lin[1], Chao-Chi Ho[1]

Cytomegalovirus (CMV) pneumonia is a common infectious disease in immunocompromised patients. Accurate diagnosis of CMV infection is important to improve the survival rate. We reported a middle-aged man with Henoch-Schonlein purpura under long-term immunosuppressant treatment who had fever and dry cough for 1 week. Chest computed tomography showed multiple peribronchial patches and ground glass opacities in bilateral lungs. Community-acquired pneumonia was considered initially and antibiotics were prescribed, but the chest image and clinical symptoms showed progression. Transbronchial lung cryobiopsy (TBLC) was arranged and CMV pneumonia was confirmed by pathology. There was no adverse event after TBLC and the patient recovered well after anti-viral treatment. To our knowledge, this is the first report on the use of TBLC for diagnosis of CMV pneumonia. ***(Thorac Med 2021; 36: 41-46)***

Key words: cytomegalovirus (CMV) pneumonia, endobronchial ultrasound (EBUS), transbronchial lung cryobiopsy (TBLC), virtual bronchoscopic navigation (VBN)

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Pulmonary Lymphomatoid Granulomatosis: A Case Report

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Lymphomatoid granulomatosis (LG), which was first described in the medical literature in 1972, is an uncommon lymphoproliferative disorder that is related to Epstein-Barr virus infection. The lung is the most commonly involved organ, and multiple ill-defined nodules or masses in the middle and lower lobes are its radiologic characteristics. So, pulmonary LG is easily mistaken for lung cancer with bilateral lung metastasis, metastatic tumors, pulmonary tuberculosis, vasculitis, lymphoma, or even sarcoidosis. Here, we reported a case of pulmonary LG. The initial bronchoscopic transbronchial biopsy and transthoracic needle biopsy results could not confirm the diagnosis. Pulmonary LG, grade 3, was finally diagnosed by video-assisted thoracoscopic surgery. After 3 cycles of chemotherapy, the same regimen as for diffuse large B cell lymphoma, improvement in the bilateral multiple pulmonary nodules was remarkable. ***(Thorac Med 2021; 36: 47-51)***

Key words: lymphomatoid granulomatosis, lung lymphoproliferative disorder, Epstein-Barr virus

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Primary Pulmonary Epithelioid Hemangioendothelioma Mimicking Lung Metastases: A Clinical Diagnostic Challenge

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Hsuan Ying Huang[4], Tsai-Wang Huang[1]

Pulmonary epithelioid hemangioendothelioma is a rare, low-grade malignant tumor of vascular endothelial cell origin. The prevalence of epithelioid hemangioendothelioma is less than 1 in 1 million individuals, and only 12% of cases present as lung disease only. Patients are generally asymptomatic, and the condition occurs more commonly in women. Radiologic images often show multiple, bilateral small lung lesions. However, diagnosis based on clinical and radiological findings is difficult. Histopathological examination is the gold standard. Here, we present a case of primary pulmonary epithelioid hemangioendothelioma that clinically mimicked gallbladder cancer with pulmonary metastases. ***(Thorac Med 2021; 36: 52-59)***

Key words: pulmonary epithelioid hemangioendothelioma, lung metastases, multiple pulmonary nodules

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