Mini Review
Volume 9:4, 2023

Journal of Lung Diseases & Treatment

ISSN: 2472-1018 Open Access

Lung Adenocarcinoma: A Comprehensive Overview

Jianqi Feng*

Department of Respiration, University of Guangzhou, Guangzhou, China

Abstract

Lung cancer is one of the most prevalent and deadly forms of cancer worldwide, accounting for a substantial portion of cancer-related deaths. Among the various histological subtypes of lung cancer, lung adenocarcinoma stands out as the most common. This specific subtype has unique characteristics, clinical features and therapeutic considerations. In this comprehensive review, we will delve into the various aspects of lung adenocarcinoma, including its definition, epidemiology, risk factors, pathogenesis, clinical presentation, diagnosis, treatment modalities and future directions in research and therapy. Lung adenocarcinoma, also referred to as adenocarcinoma of the lung, is a histological subtype of Non-Small Cell Lung Cancer (NSCLC).

Keywords: Lung adenocarcinoma • Epidemiology • Diagnosis

Introduction

Lung adenocarcinoma is the most common histological subtype of lung cancer, accounting for approximately 40% of all lung cancer cases. Its incidence varies significantly based on geographic, ethnic and gender factors. In recent years, adenocarcinoma has been increasingly prevalent, especially among non-smokers and younger individuals. While it is more commonly diagnosed in women and individuals of Asian descent, it affects both genders and various ethnic groups worldwide. Several factors contribute to the development of lung adenocarcinoma, with cigarette smoking being the most significant. Exposure to environmental carcinogens, such as second-hand smoke and industrial pollutants, also increases the risk. However, lung adenocarcinoma is unique in that it is more common among non-smokers, suggesting the influence of genetic, hormonal and environmental factors. Other risk factors include a history of pulmonary fibrosis, radon exposure, family history of lung cancer and certain genetic mutations [1].

Literature Review

The pathogenesis of lung adenocarcinoma is a complex interplay of genetic mutations, environmental exposures and host factors. Mutations in key genes, such as EGFR, KRAS, ALK, ROS1 and BRAF, have been identified as drivers of adenocarcinoma development. The Epidermal Growth Factor Receptor (EGFR) mutation is particularly important, as it has therapeutic implications, with targeted therapies like EGFR inhibitors showing significant clinical benefit. Environmental exposures, like asbestos, radon and air pollution, can induce cellular damage and promote tumorigenesis. Additionally, inflammation and chronic lung diseases, such as Chronic Obstructive Pulmonary Disease (COPD), can contribute to lung adenocarcinoma. These factors collectively contribute to the initiation and progression of the disease.

***Address for Correspondence:** Jianqi Feng, Department of Respiration, University of Guangzhou, Guangzhou, China; E-mail: feng.j22@gmail.com*

Received: 28 June, 2023, Manuscript No. LDT-23-118590; **Editor Assigned:** 30 June, 2023, PreQC No. P-118590; **Reviewed:** 12 July, 2023, QC No. Q-118590; **Revised:** 19 July, 2023, Manuscript No. R-118590; **Published:** 28 July, 2023, DOI: 10.37421/2472-1018.2023.9.197

Discussion

The clinical presentation of lung adenocarcinoma can vary widely and often depends on the stage and location of the tumor. A persistent, worsening cough is a frequent early sign of lung adenocarcinoma. As the tumor grows and obstructs airways, patients may experience difficulty in breathing. Pain in the chest, often localized to the affected lung, can occur as the tumor invades nearby structures. Hemoptysis, or coughing up blood, may be a concerning symptom. Unintentional weight loss is a non-specific but concerning symptom in many cancer patients. Generalized fatigue and weakness are often experienced as the disease progresses. In addition to these common symptoms, some patients may remain asymptomatic until the disease reaches advanced stages or presents with distant metastases. The diagnosis of lung adenocarcinoma is a multi-step process that typically begins with imaging studies and progresses to tissue sampling for histological examination [2].

Initial assessment often involves a chest X-ray, which may reveal suspicious lung nodules or masses. A Computed Tomography (CT) scan is more sensitive than X-ray and can provide detailed information about the size, location and characteristics of the tumor. A bronchoscopy involves the insertion of a flexible tube into the airways to directly visualize and biopsy suspicious lesions. To establish a definitive diagnosis, a small piece of tissue is sampled from the tumor and examined under a microscope. FNA and core biopsy are common methods for obtaining tissue samples. After diagnosis, molecular and genetic testing is often performed to identify specific mutations or alterations in genes, which can guide treatment decisions, especially in the case of targeted therapies [3].

Chemotherapy is a systemic treatment option used to target cancer cells throughout the body. It is typically administered in combination with other therapies. Radiation therapy uses high-energy X-rays or other forms of radiation to target and kill cancer cells. It can be used before or after surgery, or as a palliative treatment for advanced disease. Targeted therapies are drugs that specifically target the molecular alterations driving the cancer. EGFR inhibitors, ALK inhibitors and ROS1 inhibitors are examples of targeted therapies for specific mutations. Immune checkpoint inhibitors, such as PD-1 and PD-L1 inhibitors, have shown promise in treating lung adenocarcinoma by harnessing the body's immune system to fight cancer. Many treatment regimens involve a combination of chemotherapy, targeted therapy and immunotherapy to improve treatment outcomes [4].

Lung adenocarcinoma is staged using the TNM system, which considers the size and extent of the primary tumor (T), the involvement of lymph nodes (N) and the presence of distant metastases (M). The choice of treatment for lung adenocarcinoma depends on the stage at diagnosis and the patient's overall health. Surgical resection is often recommended for early-stage lung adenocarcinoma. Lobectomy, segmentectomy, or wedge resection may be

performed, depending on the size and location of the tumor. It derives its name from its resemblance to glandular tissues and often grows in the peripheral regions of the lungs. Adenocarcinoma is known for its diverse cellular morphology, with the capacity to differentiate into various cell types, including acinar, papillary, lepidic and solid patterns. This heterogeneity can present challenges in both diagnosis and treatment [5,6]

Conclusion

The prognosis for lung adenocarcinoma varies widely depending on the stage at diagnosis and the presence of specific molecular alterations. Early-stage adenocarcinoma that is amenable to surgical resection offers the best chance for long-term survival. However, advanced-stage disease has a significantly poorer prognosis. Molecular testing plays a crucial role in prognosis and treatment decisions. Patients with certain mutations, such as EGFR or ALK, may have a more favorable response to targeted therapies, leading to improved outcomes.

Acknowledgement

None.

Conflict of Interest

There are no conflicts of interest by author.

References

1. Garcia, Christine Kim. "Idiopathic pulmonary fibrosis: Update on genetic discoveries." *Proc Am Thorac Soc* 8 (2011): 158-162.
2. Bocchino, Marialuisa, Savina Agnese, Evelina Fagone and Silvia Svegliati, et al. "Reactive oxygen species are required for maintenance and differentiation of primary lung fibroblasts in idiopathic pulmonary fibrosis." *PLoS One* 5 (2010): e14003.
3. Taskar, Varsha S. and David B. Coultas. "Is idiopathic pulmonary fibrosis an environmental disease?." *Proc Am Thorac Soc* 3 (2006): 293-298.
4. Moeller, Antje, Sarah E. Gilpin, Kjetil Ask and Gerard Cox, et al. "Circulating fibrocytes are an indicator of poor prognosis in idiopathic pulmonary fibrosis." *Am J Respir Crit Care Med* 179 (2009): 588-594.
5. Chilosi, Marco, Alberto Zamò, Claudio Doglioni and Daniela Reghellin, et al. "Migratory marker expression in fibroblast foci of idiopathic pulmonary fibrosis." *Respir Res* 7 (2006): 1-10.
6. Degryse, Amber L., Harikrishna Tanjore, Xiaochuan C. Xu and Vasiliy V. Polosukhin, et al. "Repetitive intratracheal bleomycin models several features of idiopathic pulmonary fibrosis." *Am J Physiol Lung Cell Mol Physiol* 299 (2010): L442-L452.

How to cite this article: Feng, Jianqi. "Lung Adenocarcinoma: A Comprehensive Overview." *J Lung Dis Treat* 9 (2023): 197.