

What is Lung Cancer?

Preventive Methods and Treatment



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Primary lung cancer is the most common malignancy worldwide, with an incidence of around 2 million of new cases in 2018.¹

Lung cancer originates from cells lining the bronchial airways or lung parenchyma. There are two main types of primary lung cancer: small cell lung cancer (SCLC, 10 to 15% of all lung cancers) and non-small cell lung cancer (NSCLC, 80-90% of all lung cancers)^{2,3}. SCLC is composed of small size cells when viewed under a microscope whereas NSCLC has three main histological subtypes: adenocarcinoma, squamous cell carcinoma and large cell carcinoma.

Therefore, lung cancer constitutes a group of heterogeneous diseases that are different histologically and even molecularly for the same histology. For example, the comprehensive molecular profiling of lung adenocarcinoma identifies 18 genetic mutations implicated each in a different natural history and thus, a different therapeutic approach.⁴

Preventive Methods

Lung cancer is the most preventable cancer as 71% of related deaths are caused by smoking. We have more evidence that smoking increases the incidence and the mortality rates of lung cancer whereas smoking cessation “delays the risk of developing and dying from cancer” even among older adults⁵. Also, avoiding secondhand smoke or passive smoking can decrease the risk of developing lung

cancer. Other preventive measures could be avoiding indoor pollution by radon or other cancer-causing chemicals at work place. Eating healthy diet and regular exercising may reduce all over cancer incidence and mortality but data are still conflicting concerning lung cancer⁶. To note, beta-carotenes supplementation increased lung cancer risk in current smokers and should be avoided⁷.

Lung Cancer Treatment

Treatment of lung cancer include surgery, radiation therapy, chemotherapy and targeted therapy. It depends on the stage of the disease. For patients with early-stage NSCLC, the mainstay of the treatment is surgery when feasible, offering the chance of cure. For those with locally advanced NSCLC, a multimodality approach is offered in order to cure the disease sometimes or to improve symptoms and prolong survival some other times. For those with metastatic disease, a systemic anti-cancer therapy may be used such as chemotherapy, targeted therapy, immunotherapy or a combination of all these agents. The aim of this treatment is to control symptoms, ameliorate quality of life and prolong survival.

Earlier in the 20th century, there were no effective treatments for lung cancer. However, during the last 50 years, surgical skills as well as preoperative staging techniques, such as imaging and global physical assessment, have become highly precise leading to a better selection of surgical candidates, safer procedures and excellent surgical results. Furthermore, the modern radiation therapy machines have also become highly developed with a “better tumor field planning and a more focused targeting of the cancer lesion” improving the treatment results.⁸

However, the major development has occurred in the field of systemic anti-cancer therapy. Chemotherapy agents improved and oncologists have acquired a better expertise in the mode of administration of these agents and a better management of their side effects. For example, patients with advanced NSCLC had a poor survival out come if they didn’t receive any treatment. But with the introduction of the new chemotherapeutic protocols developed in

the early 2000s and administered, for the most, in an outpatient setting, overall survival has slightly increased⁸. Additionally, a survival benefit was also noticed when the choice of the chemotherapy agent was guided by the histologic subtype of the lung cancer.

Moreover, the advance in biotechnology has allowed the development of molecular profiling of the tumors and the discovery of genetic mutations such as EGFR, ALK and ROS1 implicated in the treatment of non-squamous NSCLC. This innovation lead to the development of a new class of targeted therapy called tyrosine kinase inhibitors (TKI). Survival of patients with non-squamous NSCLC harboring such mutations has been dramatically improved when treated with TKIs².

Finally, we should note that the major breakthrough in the treatment of NSCLC was the introduction of immune checkpoint inhibitors (CPI) in the therapeutic armamentarium. This monoclonal antibody targets a protein called PD-1 on the immune T-cell. The interaction of PD-1 with PDL-1 another protein on the cancer cells inhibits the immune cell activity. CPIs blocks the interaction of PD-1/PDL-1 and thus may reactivates the cytotoxic T-cell and allows them to attack the tumor⁹. CPIs drastically prolong median overall survival and some patients with advanced NSCLC may enjoy a long-lasting and durable response to it with an improved quality of life². Multiple ongoing studies are underway to determine their role in earlier stages.

These therapeutic advances allowed us to offer patients with advanced NSCLC a personalized approach of treatment rather than a hazardous one.

Nowadays, patients with advanced NSCLC should be screened for EGFR, ALK, ROS1 mutations and tested for PDL1 status so the treatment will be chosen accordingly².

In conclusion, the landscape of treatment of lung cancer has changed in the last years. The treatment becomes more sophisticated, refined and targeted. These improvements are reflected by an increase insurvival and a better quality of life.

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