

Management of Lung Cancer

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Abstract

Lung cancer is the second most common cancer, accounting for about one out of five malignancies in men and one out of nine in women. Unfortunately, over the past several years, while the incidence of lung cancer has gradually declined in men, it has been rising alarmingly in women. In 1940 only seven women in 100,000 developed the disease; today the rate is 42 in 100,000. And all the evidence points to smoking as the cause.

The majority (85%) of cases of lung cancer are due to long term tobacco smoking. About 10–15% of cases occur in people who have never smoked. These cases are often caused by a combination of genetic factors and exposure to radon gas, asbestos, second hand smoke, or other forms of air pollution.

Keywords: Lung; Cancer; Smoking; Genetic; Radon; Air pollution.

INTRODUCTION

Cancer is a disease in which cells in the body grow out of control. When cancer starts in the lungs, it is called lung cancer. The lungs are two spongy organs in the chest cavity that take in oxygen when the person inhale and release carbon dioxide when he/she exhale.

Lung cancer is the most common leading cause of cancer deaths worldwide. People who smoke have the greatest risk of lung cancer, and lung cancer can also occur in people who have non-smoked.

The risk of lung cancer increases with the length of time and number of cigarettes you've smoked. If you quit smoking, even after smoking for many years, you can significantly reduce the chances of developing lung cancer.

DEFINATION

“Lung cancer is the uncontrolled growth of abnormal cells that start off in one or both lungs, usually in the cells that line the air passages.”

Classification

Lung cancers are classified according to histological type. For therapeutic purposes, two broad classes are distinguished: non-small-cell lung carcinoma and small-cell lung carcinoma

- **Non-small-cell lung carcinoma:** The three main subtypes of NSCLC are adenocarcinoma (arise in the outer, or peripheral, areas of the lungs), squamous-cell carcinoma (arise most frequently in the central chest area in the bronchi) and large cell carcinoma

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(undifferentiated carcinomas).

- **Small-cell lung carcinoma (SCLC):** In the cells contain dense neurosecretory granules (vesicles containing neuroendocrine hormones), which give this tumor an endocrine/para neoplastic syndrome association.

ETIOLOGY/RISK FACTORS

So many causes that may lead the risk of lung cancer. These are-

- **Smoking:** Cigarette smoking is the number one risk factor for lung cancer. Doctors believe smoking causes lung cancer by damaging the cells that line the lungs. When you inhale cigarette smoke, which is full of cancer-causing substances (carcinogens), changes in the lung tissue begin almost immediately.
- **Exposure to secondhand smoke:** Even if you don't smoke, your risk of lung cancer increases if you're exposed to secondhand smoke.
- **Previous radiation therapy:** If you've undergone radiation therapy to the chest for another type of cancer, you may have an increased risk of developing lung cancer.
- **Exposure to radon gas:** Radon is produced by the natural breakdown of uranium in soil, rock and water that eventually becomes part of the air you breathe. Unsafe levels of radon can accumulate in any building, including homes.
- **Exposure to asbestos and other carcinogens:** Workplace exposure to asbestos and other substances known to cause cancer—such as arsenic, chromium and nickel—can increase your risk of developing lung cancer, especially if you're a smoker.
- **Family history of lung cancer:** People with a parent, sibling or child with lung cancer have an increased risk of the disease.

SYMPTOMS

Different people have different symptoms for lung cancer. Most people with lung cancer don't have symptoms until the cancer is advanced. Lung cancer symptoms may include:

- Coughing that gets worse or doesn't go away.
- Chest pain.

- Shortness of breath.
- Wheezing.
- Coughing up blood.
- Feeling very tired all the time.
- Weight loss with no known cause.

COMPLICATIONS OF LUNG CANCER

As lung cancer progresses, it can cause complications. Complications may result from the cancer spreading to other areas of your body or as a side effect of your treatment plan.

- **Shortness of breath:** People with lung cancer can experience shortness of breath if cancer grows to block the major airways.
- **Coughing up blood:** Lung cancer can cause bleeding in the airway, which can cause you to cough up blood (hemoptysis).
- **Pain:** Advanced lung cancer that spreads to the lining of a lung or to another area of the body, such as a bone, can cause pain.
- **Fluid in the chest (pleural effusion):** Lung cancer can cause fluid to accumulate in the space that surrounds the affected lung in the chest cavity (pleural space). Fluid accumulating in the chest can cause shortness of breath.
- **Cancer that spreads to other parts of the body (metastasis):** Lung cancer often spreads (metastasizes) to other parts of the body, such as the brain and the bones.

DIAGNOSTIC EVALUATION

If there's reason to think that you may have lung cancer, your doctor can order a number of tests to look for cancerous cells and to rule out other conditions.

Tests may include:

- **Chest X-ray:** An X-ray image of your lungs may reveal an abnormal mass or nodule).
- **Imaging tests:** An X-ray image of your lungs may reveal an abnormal mass or nodule. A CT scan can reveal small lesions in your lungs that might not be detected on an X-ray.
- **Sputum cytology:** If you have a cough and are producing sputum, looking at the sputum under the microscope can sometimes reveal the presence of lung cancer cells.
- Positron emission tomography (PET)

- MRI (Magnetic resonance imaging)
- **Tissue sample (biopsy):** A sample of abnormal cells may be removed in a procedure called a biopsy.
- **Biomarkers:**
 1. **Cytokeratin fragment 21-1**
 - Cancer type: Lung cancer
 - Tissue analyzed: Blood.
 2. **EGFR (Epidermal growth factor receptor) gene mutation analysis**
 - **Cancer type:** Non-small cell lung cancer
 - **Tissue analyzed:** Tumor
 3. **Programmed death ligand 1 (PD-L1)**
 - Cancer type: Non-small cell lung cancer
 - Tissue analyzed: Tumor
 4. **Anaplastic lymphoma kinase (ALK) fusion:**
 - **Cancer types:** Non-small cell lung cancer and anaplastic large cell lymphoma
 - **Tissue analyzed:** Tumor
 5. **KRAS gene mutation analysis**
 - **Cancer types:** Colorectal cancer and non-small cell lung cancer
 - **Tissue analyzed:** Tumor

PREVENTION

There's no sure way to prevent lung cancer, but you can reduce your risk if you:

- **Don't smoke:** If you've never smoked, don't start. Talk to your children about not smoking so that they can understand how to avoid this major risk factor for lung cancer.
- **Stop smoking:** Stop smoking now. Quitting reduces your risk of lung cancer, even if you've smoked for years. Talk to your doctor about strategies and stop-smoking aids that can help you quit.
- **Avoid secondhand smoke:** If you live or work with a smoker, urge him or her to quit. At the very least, ask him or her to smoke outside. Avoid areas where people smoke, such as bars and restaurants, and seek out smoke free options.
- **Avoid carcinogens at work:** Take precautions to protect yourself from exposure to toxic chemicals at work. Follow your employer's precautions. For instance, if you're given a face mask for protection, always wear it.
- **Eat a diet full of fruits and vegetables:** Choose a healthy diet with a variety of fruits and vegetables. Food sources of vitamins and nutrients are best. Avoid taking large doses of vitamins in pill form, as they may be harmful.
- **Exercise most days of the week:** If you don't exercise regularly, start out slowly. Try to exercise most days of the week.

MANAGEMENT

Options typically include one or more treatments including:

- Surgery
- Radiation therapy
- Chemotherapy
- Targeted drug therapy

1. SURGICAL MANAGEMENT

Procedures to remove lung cancer include:

- i. Wedge resection to remove a small section of lung that contains the tumor along with a margin of healthy tissue.
- ii. Segmental resection to remove a larger portion of lung, but not an entire lobe.
- iii. Lobectomy to remove the entire lobe of one lung.
- iv. Pneumonectomy to remove an entire lung.
- v. Sleeve Resection: This procedure may be done for cancers located in the central area of the lung and spreading into a bronchus. In this procedure, the affected section of the bronchus and any surrounding cancer in the lobe is surgically removed.

Complications After Surgery

- A. Bleeding into the thorax.
- B. The need for a respirator for a prolonged period after surgery.
- C. Pulmonary edema or accumulation of fluid in the lungs.
- D. Pneumonia or lung infection.
- E. Broncho pleural fistula, or an abnormal

communication between the bronchus and pleura.

- F. Deep vein thrombosis or blood clots in the legs due to immobility during and after the surgery problems.
- G. Heart problems: such as a heart attack, or abnormal heart rhythms.

2. RADIATION THERAPY:

Radiation therapy uses high-energy rays (such as x-rays) or particles to kill cancer cells. There are 2 main types of radiation therapy:

- A. External beam radiation therapy
- B. Brach therapy (internal radiation therapy)

- 3. **CHEMOTHERAPY:** Chemotherapy uses drugs to kill cancer cells. One or more chemotherapy drugs may be given through a vein in your arm (intravenously) or taken orally.

You usually have chemotherapy every 3 to 4 weeks. Each 3 to 4 week period is called a cycle. You might have between 4 to 6 cycles of chemotherapy.

The Chemo Drugs most often used include

- Cisplatin (60Mg /M2, Iv. Day 1)
- Carboplatin (5-6 Iv Day 1)

- 4. **TARGET THERAPY:** Targeted therapies are newer cancer treatments that work by targeting specific abnormalities in cancer cells. Targeted therapy drugs are often used in combination with chemotherapy drugs.

Targeted therapy options for treating lung cancer include:

- Afatinib (40mg / orally/ day)
- Bevacizumab (15mg/iv/every 3 week)

CONCLUSION

A plan for the diagnosis and treatment of cancer is a key component of any overall cancer control plan. Its main goal is to cure cancer patients or prolong their life considerably, ensuring a good quality of life. In order for a diagnosis and treatment programme to be effective, it must never be developed in isolation. It needs to be linked to an early detection programme so that cases are detected at an early stage, when treatment is more effective and there is a greater chance of cure.

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