What is EGFR-positive lung cancer?

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A person with EGFR-positive lung cancer has cancer with the EGFR mutation. This means their epidermal growth factor receptor (EGFR) protein does not function as normally intended.

EGFR is a protein found on the surface of body cells. According to the Lung Cancer Foundation of America (LCFA), it is mostly found in skin cells, although it can also be present in other cells of the body.

This article discusses what EGFR mutation lung cancer is, as well as its symptoms, prevalence, and treatments.

What is EGFR in lung cancer?

The function of EGFR is to help cells grow and divide. If an EFGR mutation is present, the EGFR protein will not work correctly.

An EGFR mutation occurs when there is an error in the DNA that makes up the protein. These errors are also a type of biomarker. A biomarker is a biological molecule that can be an indicator of a certain condition or disease, according to the National Cancer Institute (NCI).

A person with EGFR-positive lung cancer has EGFR protein that is constantly signaling for cells to grow and divide. Rapid cell creation leads to abnormal cell growth, which is what cancer is.

What types of EGFR mutations are there?

There are various mutations the EGFR protein can have. The most common EGFR mutations are EGFR 19 deletion or EGFR L858R point mutation.

Rarer mutations, such as EGFR exon 20 insertions, have different treatments compared to other EGFR mutations.

Mutations in EGFR DNA can occur in the following ways:

- insertions, where additional code is inserted into a DNA sequence
- deletions, where the DNA is missing certain sequences
- point mutations, where a single nucleotide is altered

What type of lung cancer can these mutations cause?

According to the American Cancer Society (ACS), the two main types of lung cancer are small-cell lung cancer (SCLC) and non-small cell lung cancer (NSCLC).

In most cases, EGFR-positive lung cancer presents as adenocarcinoma, which is a subtype of NSCLC and forms in cells that normally secrete substances such as mucus.

More rarely, EGFR-positive lung cancer may present as lung squamous cell carcinoma, which is another type of NSCLC.

EGFR mutations in SCLC are also rare.

How common is it?

The American Lung Association (ALA) states that EGFR mutation lung cancer occurs in around 10–15% of lung cancers in the United States.

The LCFA notes that about 50% of these EGFR mutations occur in young adults with lung cancer.

NSCLC accounts for around 80–85% of all lung cancers. Research from 2020 estimates that 32.4% of NSCLC cases worldwide have the EGFR mutation. Other research estimates it could be as high as 50–80% of cases.

What are the symptoms?

EGFR mutation lung cancer does not have specific symptoms. Instead, EGFR mutation lung cancer will show symptoms of the overall type of lung cancer to which is it connected.

According to the ACS, most lung cancers do not have symptoms until they have spread. Occasionally, people in the early stages of lung cancer do have symptoms, which can include:

- a persistent cough that may get worse
- coughing up blood or rust-colored sputum, which can be spit or phlegm
- chest pain that worsens with deep breathing, coughing, or laughing
- hoarseness
- loss of appetite
- unexplained weight loss
- shortness of breath
- feeling weak or tired
- infections such as bronchitis or pneumonia that keep returning or will not clear
- wheezing

If a person's lung cancer spreads, they may experience:

- bone pain
- headache
- weakness or numbness of the arm or leg
- dizziness
- balance problems
- seizures
- jaundice, a condition of the liver that can cause yellowing of the skin and eyes

If a person notices any of these symptoms, they should contact a doctor as soon as possible. The earlier a healthcare professional diagnoses lung cancer, the easier it can be to treat the cancer.

Is EGFR lung cancer aggressive?

Since more EGRF-positive diagnoses are NCLSC, this is often an aggressive cancer with a high probability of death. Once it metastasizes, a person's life expectancy is reduced to below 40%, per the ACS.

Who does it affect?

Anyone can develop EGFR mutation lung cancer. However, it is more common in certain groups, including:

- nonsmokers, or people who smoke very little
- people who have lung adenocarcinoma
- females
- young adults with lung cancer

Research indicates ECFR mutation lung cancer occurs more often in people of Asian or East Asian ethnicity.

How is EGFR lung cancer treated?

There are various treatments available to treat EGFR mutation lung cancer. They include:

- surgery to remove the cancer
- chemotherapy
- immunotherapy, which helps the immune system fight the cancer
- clinical trials, where a person takes part in a trial for an investigational drug used to treat cancer

Additionally, a person may receive targeted therapies to treat the EGFR mutation lung cancer. Targeted therapies target the specific genes or proteins of a cancer type.

targets, the signals from the EGFR protein that encourage cell growth. EGFR inhibitors include:

- afatinib
- gefitinib
- erlotinib
- osimertinib
- necitumumab
- dacomitinib
- amivantamab
- mobocertinib

EGFR inhibitors may be prescribed at any stage of lung cancer. For example, the ALA notes that osimertinib can treat stages 1–4 lung cancer. In some cases, a healthcare professional may prescribe osimertinib after chemotherapy.

Although EGFR inhibitors can be effective treatments, they can only control the growth of the EGFR mutation lung cancer for several months or years. After a certain amount of time, a person's EGFR mutation lung cancer may become resistant to the EGFR inhibitor.

The ACS notes that EGFR inhibitors can cause certain side effects, including:

- skin problems, such as an acne-like rash
- diarrhea
- mouth sores
- loss of appetite

It's important that a person talk and work with their doctor to determine the best treatment option.

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How is it diagnosed?

Before starting treatment, a doctor will order tests to determine the type of lung cancer a person has.

There are two ways a doctor can diagnose a person with EGFR mutation lung cancer:

Comprehensive biomarker testing

Comprehensive biomarker testing, or comprehensive next-generation sequencing (NGS), involves taking a sample of a person's lung tumor.

The tissue sample is placed into a machine that tests its biomarkers.

A liquid biopsy involves taking a blood sample from a person and testing it for certain biomarkers.

What is the life expectancy of EGFR lung cancer patients?

The survival rate for EGFR mutation lung cancer can depend on:

- the stage at the time of diagnosis
- a person's age and overall health
- the cancer's response to treatment
- the type of EGFR mutation

Further research from 2020 involved reviewing clinical information for people with EGFR mutation lung adenocarcinoma that had spread to the brain. Researchers found that following treatment with EGFR inhibitors, the survival rates for people with EGFR mutation lung adenocarcinoma were:

- 95.6% after a year
- 74% after 2 years

Additionally, the researchers found that the median overall survival rate for people with this form of cancer was between 25.8 and 44.2 months.

A 2019 study from Peru found that following treatment with a tyrosine kinase inhibitor, people with EGFR mutation lung cancer under age 65 years had a higher survival rate than older people. However, this study was small and limited to participants in Peru.

Summary

EGFR mutation in lung cancer occurs due to a mutation in a person's EGFR protein.

There are various subtypes of EGFR mutations. The type of EGFR mutation a person has depends on how the EGFR's DNA sequence has been altered.

EGFR mutation lung cancer is mostly found in non-small cell lung cancer. There are certain risk factors that can cause a person to have a higher chance of developing EGFR mutation lung cancer.

Depending on a person's age, overall health, and stage of diagnosis, the outlook for a person with EGFR mutation lung cancer can vary.

If a person notices any symptoms of lung cancer, it's important that they speak with a doctor immediately.

Last medically reviewed on September 6, 2023

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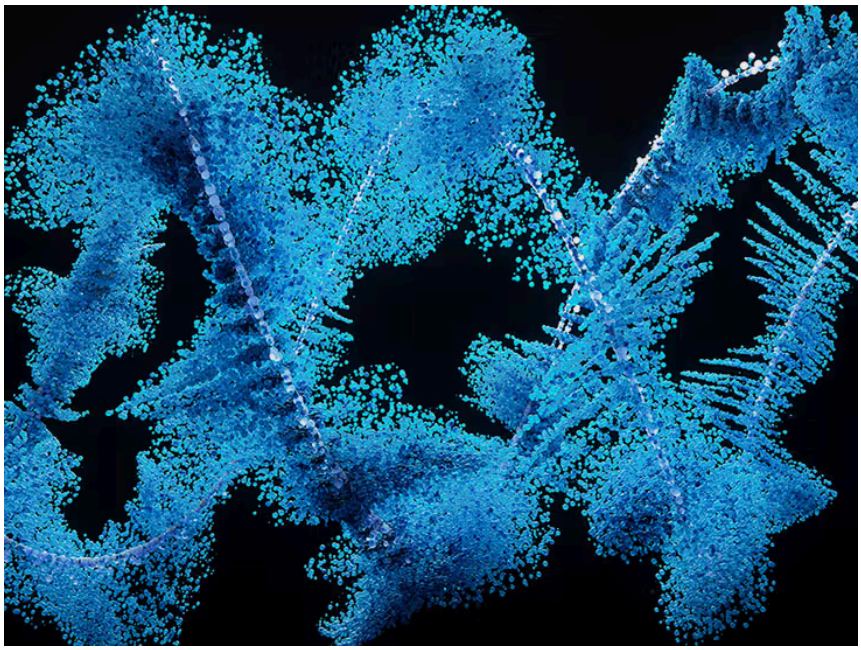

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