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A Review Article on Lung Cancer for Non-Smokers Recenct Trend

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ABSTRACT
Lung cancer is the leading cause of cancer- related death in the United States. Although tobacco smoking accounts for the majority of lung cancer, approximately 10% of patients with lung cancer in the United States are life-long never smokers. Lung cancer in the never smokers (LCINS) affects women disproportionately more often than men. Only limited data are available on the etiopathogenesis, molecular abnormalities, and prognosis of LCINS. Several etiologic factors have been proposed for the development of LCINS, including exposure to radon, cooking fumes, asbestos, have metals, and environmental tobacco smoke, human papiloma virus infection, and inherited genetics susceptibility.
Adenocarcinoma is the predominate histologic subtype reported with LCINS. Striking difference in response rates and out comes are seen when patients with advanced non-small-cell lung cancer (NSCLC) who are life-long never smokers are treated with epidermal growth factor receptor tyrosine kinase (EGFR-TK) inhibitors such as gefitinib or erlotinib compared with the out comes with these agents in patients with tobacco-associated lung cancer.
Interestingly, the activating mutations in the EGFR-TK inhibitors have been reported significantly more frequently in LCINS then in patients with tobacco related NSCLC. This review will summarize available data on the aepidemiology, risk factors, molecular genetics, management options, and out comes of LCINS.
Key-words : Lung cancer, causes, risk factors, prevention.

What Causes Lung Cancer?

We don't know what causes each cases of lung cancer.
But we do know many of the risk factors for these cancers(see Lung cancer RISK FACTORS)and how some of them cause cell to become cancer.

Smoking

Smoking tobacco is by far the leading cause of lung cancer .about 80% of lung cancer deaths are cause by smoking ,and many others are caused cause by exposure to secondhand smoke.
Smoking is clearly the strongest risk for lung cancer, but it often interacts with other factors. People who smoke and are exposed to other known risk factors such as radon and asbestos are at an even higher risk. Not everyone who smokes gets lung cancers, so other factors like genetics probably play a role as well (see blow).

Causes in People Who don't smoke

Not all people who get lung cancer smoke. Many people with lung cancer formerly smoked, but many others never smoked at all. And is rare for someone who has never smoked to be diagnosed with small cell lung cancer (SCLC), but it can happen.

Lung cancer in people who don't smoke can be caused by exposure to radon, secondhand smoke, air pollution, or other factors. Work place exposures to asbestos, diesel exhaust or certain other chemicals can also cause lung cancer in some people who don't smoke. Lung cancer in people who don't smoke are often different from those that occur in people who do. They tend to develop in younger people and often have certain gene changes that are different from those in tumors found in people who smoke. In some case, these gene changes can be used to guide treatment.

Gene changes that may lead to lung cancer

Scientists know how some of the risk factors for lung cancer can cause certain changes in the DNA of lung cells. These changes can lead to abnormal cell growth and, sometimes, cancer. DNA is the chemical in our cells that makes up our genes, which control how our cells function. DNA, which comes from both our parents, affects more than just how we look. It also can influence our risk

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for developing certain diseases, including some kinds of cancer.

Some genes help control when cells grow, divide to make new cells, and die:

Genes that help cells grow, divide, or stay alive are called **oncogenes**

Genes that help control cell division or cause cells to die at the right time are called **tumor suppressor genes**

Cancers can be caused by DNA changes that turn on oncogenes or turn off tumor suppressor genes. Changes in many different genes are usually needed to cause lung cancer.

Inherited gene changes

Some people inherit DNA mutations (changes) from their parents that greatly increase their risk for developing certain cancers. But inherited mutations alone are not thought to cause very many lung cancers.

Still, genes do seem to play a role in some families with a history of lung cancer. For example, people who inherit certain DNA changes in a particular chromosome (chromosome 6) are more likely to develop lung cancer, even if they don't smoke or only smoke a little.

Some people seem to inherit a reduced ability to break down or get rid of certain types of cancer-causing chemicals in the body, such as those found in tobacco smoke. This could put them at higher risk for lung cancer.

Other people inherit faulty DNA repair mechanisms that make it more likely they will end up with DNA changes. People with DNA repair enzymes that don't work normally might be especially vulnerable to cancer-causing chemicals and radiation.

Some non-small cell lung cancers (NSCLCs) make too much EGFR protein (which comes from an abnormal EGFR gene). This specific gene change is seen more often with adenocarcinoma of the lung in young, non-smoking, Asian women, but the excess EGFR protein has also been seen in more than 60% of metastatic NSCLCs.

Researchers are developing tests that may help identify such people, but these tests are not yet used routinely. For now, doctors recommend that all people avoid tobacco smoke and other exposures that might increase their cancer risk.

Acquired gene changes

Gene changes related to lung cancer are usually acquired during a person's lifetime rather than inherited. Acquired mutations in lung cells often result from exposure to factors in the environment, such as cancer-causing chemicals in tobacco smoke. But some gene changes may just be random events that sometimes happen inside a cell, without having an outside cause.

Acquired changes in certain genes, such as the RB1 tumor suppressor gene, are thought to be important in the development of SCLC. Acquired changes in genes such as the p16 tumor suppressor gene and the K-RAS oncogene, are thought to be important in the development of NSCLC. Changes in the TP53 tumor suppression gene and to chromosome 3 can be seen in both NSCLC and SCLC. Not all lung cancers share the same gene changes, so there are undoubtedly changes in other genes that have not yet been found.

Trends in lung and bronchus cancer incidence rates in the United States SEER 9 registry in males by race and histology, 1973–2010.

Table 1: Incidence of histological subtype resulting in GI metastasis[34,41] or small/large bowel metastasis[39] at autopsy

	Antler et al.[34] (423 patients)		Yoshimoto et al.[41] (470 patients)		McNeill et al.[39] (431 patients)	
Histology	Percentage of cases with GI metastasis (n=58)	GI metastasis rate for this histology	Percentage of cases with GI metastasis (n=56)	GI metastasis rate for this histology	Percentage of cases with small bowel metastasis* (n=46)	Small bowel metastasis rate for this histology*
SCC	33%	11% (19/173)	17.9%	6.5% (8/123)	32.6%	7.5% (15/199)
ADC	10%	8% (6/72)	44.6%	13.1% (25/191)	28.3%	12.0% (13/108)
ADSC	5%	33% (3/9)	1.8%	8.3% (1/12)	-	-
LCC	29%	23% (11/48)	21.4%	30% (12/40)	26.1%	38.7% (12/31)
SCLC	19%	20% (17/28)	17.9%	9.9% (10/101)	13.0%	8.2% (6/73)

ADC = adenocarcinoma; ADSC = adenosquamous carcinoma; GI = gastrointestinal; LCC = large-cell carcinoma; SCC = squamous cell carcinoma; SCLC = small cell lung carcinoma.
**The remaining 20 patients demonstrated undifferentiated histology.*

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