

It's all about the Lung Cancer (Stick or Twist the Choice is Yours)

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Abstract

Smoking is the most prevalent preventable cause of human death. The burden of lung cancer strikes 900,000 men and 330,000 women each year. Tobacco smoke contains more than 2000 compounds. Among these are nicotine, which is responsible for tobacco addiction, and potent carcinogen—mainly, polycyclic aromatic hydrocarbons, nitrosamines, and aromatic amines. Approximately 90% of lung cancers occur in smokers.

Accounts for 18% of all cancer deaths. More than a threefold increase in deaths since 1950. Rates rising in women; female lung cancer deaths outnumber male in some Nordic countries. Has overtaken breast cancer in several countries, making it the most common cause of cancer deaths in men and women. Just as tobacco use and cancer rates are falling in some developed countries, both smoking and lung cancer are rising in Eastern Europe and in many developing countries. The great majority of tumors in the lung are primary bronchial carcinomas, and in contrast to many other tumors, the prognosis remains poor, with fewer than 30% of patients surviving at 1 year and 6 - 8% at 5 years. Carcinomas of many other organs, as well as osteogenic and other sarcomas, may cause metastatic pulmonary deposits [1].

Keywords: Carcinoma; Genome-wide Association Studies (GWASs); Cancer Stem Cells (CSCs); Receptor Tyrosine Kinases (RTKs); Non-small Cell Lung Cancer (NSCLC)

Introduction

Nutritional factors have been thought responsible for about 30 percent of cancers in more developed countries, making nutrient secondary only to tobacco as a mendable cause of cancer [1]. African Americans have the highest lung cancer mortality in the United States. Genome-wide association studies (GWASs) of germline variants influencing lung cancer survival have not yet been conducted with African Americans [3]. Smoking and air pollution are the major causes of lung cancer; however, numerous studies have demonstrated that genetic factors also contribute to the development of lung cancer [4]. Insights into cell-cycle networking have grown exponentially in the past several years leading to the concept that lung cancer is a disorder of the cell cycle [5]. On the row of various cancers in the world, the Lung cancer falls to number two in both female and male [6]. Lung cancer and chronic obstructive pulmonary disease have shared etiology, including key etiological changes [7]. Lung and bronchus cancer cause the most deaths of all cancers and account for about one quarter of US cancer deaths [8]. Lung cancer is now recognized as a highly heterogeneous disease that develops from genetic mutations [9]. Cancer stem cells (CSCs) are thought to be responsible for the failure of current chemotherapy of lung cancer [10]. Promising clinical efficacy has been observed with receptor tyrosine kinase inhibitors (TKIs) particularly in lung and gastric cancers with mutations [11]. Documentation of interactions and medicines reconciliation occur much less often than expected, suggesting there is scope for implementing methods of safe prescribing to prevent adverse drug effects [12]. Clinical management of NSCLC now depends on surgical, chemotherapeutics [13] and radical on treatment regimens based on pathologic findings and clinical staging as well as targeted therapies based on molecular profiling [14]. Oncologists rely on serial CT scanning to guide treatment decisions, but this cannot assess in vivo target engagement of therapeutic agents [15]. Lung cancer is one of the most prevalent forms of the illness [16]. Almost as many Americans die of lung cancer every year than die of prostate, breast, and colon cancer combined [17]. Siegel and colleagues [1] reviewed recent cancer data and estimated a total of 239,320 new cases of lung cancer and 161,250 deaths from lung cancer in the United States in 2010 [18]. The incidence and mortality rates for lung cancer tend to mirror one another because most patients diagnosed with lung cancer eventually die of it [19]. There is evidence to suggest that the use of β -carotene and isotretinoin for lung cancer chemoprevention in high-risk persons may increase their risk for lung cancer, especially in those who continue to smoke [20].

History

Lung cancer was uncommon before the advent of cigarette smoking; it was not even recognized as a distinct disease until 1761 [21]. Different aspects of lung cancer were described further in 1810 [22]. Malignant lung tumors made up only 1% of all cancers seen at autopsy in 1878 [23]. Case reports in the medical literature numbered only 374 worldwide in 1912 [24] but a review of autopsies showed the incidence of lung cancer had increased from 0.3% in 1852 to 5.66% in 1952 [25]. In Germany in 1929, physician Fritz Lickint recognized the link between smoking and lung cancer [26] which led to an aggressive antismoking campaign [27]. The British Doctors' Study, published in the 1950s, was the first solid epidemiological evidence of the link between lung cancer and smoking [28]. As a result, in 1964 the Surgeon General of the United States recommended smokers should stop smoking [29].

Silver has been mined there since 1470, and these mines are rich in uranium, with its accompanying radium and radon gas [30]. Miners developed a disproportionate amount of lung disease, eventually recognized as lung cancer in the 1870 [31]. Despite this discovery, mining continued into the 1950s, due to the USSR's demand for uranium. Radon was confirmed as a cause of lung cancer in the 1960 [32].

The first successful pneumonectomy for lung cancer was performed in 1933 [33]. Palliative radiotherapy has been used since the 1940 [34]. Radical radiotherapy, initially used in the 1950s, was an attempt to use larger radiation doses in patients with relatively early-stage lung cancer, but who were otherwise unfit for surgery [35]. In 1997, CHART was seen as an improvement over conventional radical radiotherapy [36]. With SCLC, initial attempts in the 1960s at surgical resection [37] and radical radiotherapy were unsuccessful. In the 1970s, successful chemotherapy regimens were developed [38].

Major advances and discoveries

Agents in smoke have a direct irritant effect on the tracheobronchial mucosa, producing inflammation and increased mucus production (bronchitis). Cigarette smoke also causes the recruitment of leukocytes to the lung, with increased local elastase production and subsequently injury to lung tissue, leading to emphysema. The risk of developing lung cancer is related to the number of pack years or cigarettes smoked per day. The interaction between tobacco consumption and alcohol in the development of oral cancers [1]. Risk falls slowly after smoking cessation, but remains above that in non-smokers for many years. It is estimated that 1 in 2 smokers dies from a smoking-related disease, about half in middle age. The effect of 'passive' smoking is more difficult to quantify but is currently thought to be a factor in 5% of all lung cancer deaths. In recent years, the strong link between smoking and ill health has led many Western governments to legislate against smoking in public places, and smoking prevalence and some smoking-related diseases are already declining in these countries [39].

Significant gap in research

Strategies for tobacco control should involve a focus on the individual as well as society as a whole. Tobacco cessation directed toward the individual should start with the clinician can yield cessation rates of 10 - 20%. Additive strategies include more intensive counseling, nicotine replacement therapy with patches, gum, or lozenges; and prescription medication with bupropion or varenicline. Perhaps a more intriguing phenomenon, with potential for significant impact on cessation rates, is the influence of social contact behavior on an individual smoker's abstinence decision. For instance, analysis of the Framingham Heart Study demonstrated that smoking cessation by a friend resulted in a 36% decrease in the subject's likelihood of smoking. On a social level, many initiatives have been put into place to actively discourage tobacco use. State or local laws, regulating tobacco use in restaurants, the workplace, and other public places have resulted in declines in tobacco use. Counter marketing with aggressive anti-tobacco advertisements has also contributed to tobacco cessation and abstinence. The key recipients of these messages are children; 80% of smokers will start by age 18. Preventing the start of addiction in this vulnerable population should be a top priority [40].

Ideas where the research go next?

A recent study has shown that women whose diets are loaded with saturated fat are five times as likely to develop lung cancer as women whose diets have relatively little fat. High fat diet is one in which more than 40 percent of the calories come from fat. Health professionals recommend that no more than 30 percent of calories come from fat. Less than 10 percent of these calories should come from saturated fats. Saturated fats are found in meats, dairy products, tropical vegetable oils (such as coconut, palm and palm-kernel oil), and hydrogenated vegetable oil. Eat more fruits and vegetable. But there is some good news in the link between your diet and your risk of lung cancer: Researchers have also discovered that eating fruits and vegetables may actually help protect you from the disease. A diet that includes plenty of fruits and vegetables may also help to prevent lung cancer in nonsmoking men. Peas and beans also appear to have a protective effect against lung cancer. While the National Cancer Institute recommends five servings of fruits and vegetables a day for maximum health, the researchers found that eating one-and-a-half servings of fruits and vegetables each day can reduce your risk of lung cancer by 40 percent [41,42]. But, they emphasize, you need to cut the fat out of your diet at the same time. It probably won't help to eat the same high-fat diet and just include an extra serving of fruit each day. The study suggests that fruits and vegetables are more beneficial when eaten raw rather than processed or cooked. The high temperatures during cooking or processing may destroy the healthful nutrients that help protect against cancer. Since most people fall far short of the National Cancer Institute's recommended five servings of fruits and vegetables a day, it's easy to make a simple change in your diet that could have a profound impact on your health. Choose a healthy piece of fruit for dessert next time. Your lung may thank you for it [43].

Current debate

Beta-carotene is a vitamin that seems to be hitting the headlines regularly these days. Scientific studies are showing how helpful beta-carotene can be in preventing the development of cancer. The men who took beta-carotene developed stronger and more effective cancer-fighting immune cells. And that means a lower risk of developing lung cancer. The results of the study are even more exciting because

most smokers have an abnormally low level of beta-carotene in their blood due to the harmful effects of cigarette smoke on some vitamins in the body. But, even though beta-carotene can help reduce the risk of lung cancer (and some other forms of cancer too), the best way to reduce your risk of lung cancer is to quit smoking. Even large amounts of vitamins can't overcome the huge risk of smoking [44]. This change reflects, in part, a significant refinement in the molecular categorization of lung cancer and the increasingly successful exploitation of the molecular diversity of lung tumors [45].

The trial is the first in more than 20 years to show a survival improvement in this cancer [46]. The cancer economics debate has largely centered on the provision of drugs, with access to radiotherapy and over-penetration of high cost radiation technologies under-represented in media outputs and political discussion [47].

Conclusion

Lung cancer is the leading cause of cancer death. A cough, hemoptysis, bronchial obstruction, wheezing pneumonia, coin lesion on X-ray film or non-calcified nodule on CT. All cancer anatomy bronchioloalveolar and bronchial carcinoid are associated with smoking. Adenocarcinoma is the most lung cancer in nonsmokers and females. Squamous cell carcinoma is centrally located. Hilar mass arising from bronchus, Cavitation, Cigarettes linked to smoking. Small cell (oat cell) carcinoma is central zone. It is very aggressive. May produce ACTH, ADH or Antibodies against presynaptic calcium channel (Lambert -Eaton syndrome) Amplification of myc oncogenes common. It is treated with chemotherapy. Large cell carcinoma is peripheral. Highly anaplastic, undifferentiated tumor, poor prognosis. Less responsive to chemotherapy. Can be removed surgically. Bronchial and carcinoid tumor has excellent prognosis. Metastasis rare. Mesothelioma is located on pleura. Malignancy of the pleura associated with asbestosis. Results in hemorrhage. Pancoast tumor carcinoma occurs in apex of lung causing Horner's syndrome [42].

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