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Analysis of the relationship between morbidity of lung cancer and regional economic development

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Abstract:
Lung cancer is a malignant tumor with high morbidity and mortality in the world, so it is of great significance to study the pathogenesis of lung cancer. Based on the risk of factors of lung cancer and the level of regional economic development, which provides a reference for the balance between the health risk of residents and economic development in developing countries.

Keywords: cancer, tumor, pathogenesis, economic

Introduction

Morbidity and mortality

On April 4, 2024, CA: The Cancer Journal for Clinicians released the latest global cancer burden data for 2022. Lung cancer has overtaken breast cancer to once again become the number one cancer in the world, according to new figures. Lung cancer is a major public health problem that causes a large number of deaths worldwide. IARC's GLOBOCAN 2020 estimates of cancer incidence and mortality show that lung cancer remains the leading cause of cancer deaths, accounting for an estimated 1.8 million deaths(18%)in 2020.

Risk factors and morbidity mechanism

Lung cancer risk factors: Tobacco consumption is the main cause of lung cancer. Other factors, such as occupational exposure, air pollution, genetic susceptibility and poor diet, may also play an independent or synergistic role in the pathogenesis of lung cancer. [1] It is worth noting that,Ammonia is considered by the WHO to be the second most important factor in lung cancer after smoking. In addition, smoking has a compound effect on radon daughters induced lung cancer.

Pathogenesis of lung cancer: lung cancer may originate from all of these differentiated and undifferentiated cells, from central (small cell lung cancer and squamous cell carcinoma) or peripheral (adenocarcinoma) airway compartments. The interaction between inhaled carcinogens and the upper and lower airway epithelium leads to DNA plus.Formation of compounds: DNA fragments covalently bound to carcinogenic chemicals. Medically, lung cancer is divided into non-small cell lung cancer (NSCLC) and small cell lung cancer (SCLC).Non-small cell lung cancer (nsclc) is the most common type of lung cancer, accounting for about 85% of lung cancer. Non-small cell lung cancer (nsclc) can be divided into three subtypes: squamous cell carcinoma (SCC), adenocarcinoma and large cell carcinoma (Icc). Although most cases of lung cancer are caused by tobacco smoke, But 25 percent of lung cancer cases worldwide cannot be directly attributed to smoking. There are significant differences in the epidemiological, clinical and molecular characteristics of lung cancer between non-smokers and smokers. [2]Early symptoms may be mild or considered a common respiratory problem, Causing a delay in diagnosis.

Characteristics of population distribution

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The results showed that the burden of lung cancer in the elderly population (≥ 65 years old) was much higher than that in the labor force (15~64 years old). The age-standardized incidence of lung cancer in men was higher than that in women. In areas with a high Human Development Index (HDI), the burden of lung cancer incidence and mortality is much higher than in areas with a low HDI; The country with the highest diagnosis rate of stage I lung cancer is Japan (38.6%), and the survival status of lung cancer in China, Japan and other countries has improved, but the overall survival status of lung cancer is still not optimistic.[3]

Analysis of regional economic development of lung cancer morbidity

In China, some studies have shown that with the improvement of economic development level, the incidence (mortality) of lung cancer in the same region shows a correlation of first fast and then slow rise.[4] From the perspective of the third factor, there are several main reasons.

From the perspective of cigarette sales factors, over the past 40 years, the amount of smoking has been on the rise with the improvement of the economic level. Although the government has controlled the production of cigarettes, it has also increased from 1694.7 billion in 1997 to 2442.7 billion in 2023, Generally speaking, for every 1% increase in cigarette sales, the number of lung cancer deaths will increase by 0.247 million. The number of new cases of lung cancer will increase by 0.309 million, and the number of oncology outpatient and emergency cases will increase by 83.22 million. The number of smokers showed a trend of first increasing and then stabilizing.This is also the most important factor affecting the incidence of lung cancer.

From the perspective of air pollution and aceupational exposure factors, since the 1980s, China's economy has developed rapidly and an industrial production system has been gradually established. During this process, a large number of factories, such as power generation, papermaking, textile, steel and mining, haxe polluted the air, water and soil, which has increased the environmental factors of lung cancer. Al the same time, in the early stage of industrial development, protective measures for workers is not enough either. Occupational exposure is also a high risk factor for lung cancer at this stage. Around 2000, the national requirements for environmental protection of industrial development and occupational protection of workers were strengthened, and these factors declined to a certain extent.However, with the acceleration of urbanization, the air pollution of construction sites and the increase of car ownership offset the inhibitory factors of industrial pollution to a certain extent. [5]

From the residential radon pollution factors, the last 30 years is also showing a gradual increase in the trend. But, according to Environmental Health Perspectives, radon exposure may lead to radon exposure based on data from 66 countries 14% to 17% of lung cancer cases and 3% of cancer deaths, respectively, In China, the figures are 12%–16% and 4%, respectively[6].A portion of high risk radon exposure came from miners working underground, but compared to the number of lung cancer patients, there were limited, more factors from residential radon pollution. The sources of indoor radon are mainly from soil, buildings and released from decorative materials, and also from water supply and natural gas used for heating and kitchen equipment.Since 2000, China's economic growth has been closely related to the development of urban construction, and the rapid progress of urban construction has brought about shopping malls, high-rise buildings, subways and other facilities and interior decoration, which have greatly increased the risk of radon pollution to lung cancer. In recent years, with the attention of people to radon exposure factors, more and more attention has been paid to the requirements of underground facility sealing, indoor ventilation, decoration standards, etc., which is expected to reduce the risk of radon to lung cancer to a certain extent.

In terms of other factors, besides direct factors such as smoking, radon and occupational exposure, dietary habits and work pressure are also closely and indirectly related to economic development. The habit of skipping breakfast, high oil diet and eating fried products are the independent risk factors for the occurrence of pulmonary nodules[7]. In addition, with the development of economy, mental stress, disorder of work and rest, lack of exercise and other factors brought by social competition will increase the risk of lung cancer.

Conclusions and reflections

As a developing country, China's economy has developed rapidly in the past 40 years, and the national economy and per capita income have increased substantially, but at the same time, the incidence of lung cancer has also increased synchronously, and the growth rate will slow down with the improvement of the level of economic development. Government policy formulation, such as tobacco policy, industrial environmental protection requirements and workers' labor security requirements, real estate and other infrastructure construction environmental protection standards, will play a certain inhibitory role in lung cancer treatment factors brought about by economic development.

In the field of medicine, although some progress has been made in the treatment of lung cancer, the treatment of

lung cancer still faces great challenges, because many patients have no obvious symptoms in the early stage of the disease, resulting in missing the best treatment opportunity. Regular checkups, quitting smoking and reducing exposure to harmful substances are all effective ways to prevent lung cancer. Therefore, it is suggested that developing countries and regions should develop their economies at the same time. We should take into account the impact on the environment and human health, balance the relationship between economic growth and environmental health, and reduce the harm of malignant tumors such as lung cancer to human beings.

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