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Tuberculosis (TB) and Lung Cancer

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Abstract : Lung cancer has been recognized as one of the greatest common cancers, causing the annual mortality rate of about 1.2 million people in the world. Lung cancer is the most prevalent cancer in men and the third-most common cancer among women (after breast and digestive cancers).Recent evidences have shown the inflammatory process as one of the potential factors of cancer. Tuberculosis (TB), pneumonia, and chronic bronchitis are among the most important inflammation-inducing factors in the lungs, among which TB has a more profound role in the emergence of cancer.TB is one of the important mortality factors throughout the world, and 205,000 death cases are reported annually due to this disease. Chronic inflammation and fibrosis due to TB can induce genetic mutation and alternations. Parenchyma tissue of lung is involved in both diseases of TB and lung cancer, and continuous cough in lung cancer, morphological vascular variations, lymphocytosis processes, and generation of immune system mediators such as interleukins, are all among the factors leading to the hypothesis regarding the role of TB in lung cancer Some reports have shown that the induction of necrosis and apoptosis or TB reactivation, especially in patients with immune-deficiency, may result in increasing IL-17 and TNF_α, which will either decrease P53 activity or increase the expression of Bcl-2, decrease Bax-T, and cause the inhibition of caspase-3 expression due to decreasing the expression of mitochondria cytochrome oxidase. It has been also indicated that following the injection of BCG vaccine, the host immune system will be reinforced, and in particular, the rates of gamma interferon, nitric oxide, and interleukin-2 are increased. Therefore, CD4 + lymphocyte function will be improved, and the person will be immune against cancer.Numerous prospective studies have so far been conducted on the role of TB in lung cancer, and it seems that this disease is effective in that particular cancer.One of the main challenges of lung cancer is its correct and timely diagnosis. Unfortunately, clinical symptoms (such as continuous cough, hemoptysis, weight loss, fever, chest pain, dyspnea, and loss of appetite) and radiological images are similar in TB and lung cancer. Therefore, anti-TB drugs are routinely prescribed for the patients in the countries with high prevalence of TB, like Pakistan. Regarding the similarity in clinical symptoms and radiological findings of lung cancer, proper diagnosis is necessary for TB and respiratory infections due to nontuberculousmycobacteria (NTM). Some of the drug resistive TB cases are, in fact, lung cancer or NTM lung infections. Acid-fast staining and histological study of phlegm and bronchial washing, culturing and polymerase chain reaction TB are among the most important solutions for differential diagnosis of these diseases. Briefly, it is assumed that TB is one of the risk factors for cancer. Numerous studies have been conducted in this regard throughout the world, and it has been observed that there is a significant relationship between previous TB infection and lung cancer. However, to prove this hypothesis, further and more extensive studies are required. In addition, as the clinical symptoms and radiological findings of TB, lung cancer, and non-TB mycobacteria lung infections are similar, they can be misdiagnosed as TB.

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