EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 11
Issue: 4
222-229
Year: 2024

LUNG CANCER – AN UPDATED REVIEW

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Article Received on 20/02/2024 **Article Revised on 11/03/2024** **Article Accepted on 31/03/2024**

ABSTRACT
The unchecked proliferation of lung cells is the hallmark of lung cancer. The most common cancer-related fatality worldwide is lung cancer. Both new cases and deaths from lung cancer are on the rise worldwide. Males and females aged 70 and up have the highest risk of developing lung cancer. Concern for lung cancer should be raised in smokers or former smokers if they develop a new cough, as it occurs in around 50% of patients with lung cancer. There is still a lot we don't know about the complicated pathophysiology of lung cancer. People who smoke cigarettes or are exposed to carcinogens regularly may develop dysplasia of the lung epithelium. When diagnosing lung cancer, the two most common methods are flexible bronchoscopy and transthoracic sampling. Immunotherapy works by enhancing the immune system's ability to detect and respond to cancer cells as foreign invaders. Radiation treatment followed by four to six chemotherapy cycles is the standard treatment for LS-SCLC that involves mediastinal or hilar lymph nodes.

KEYWORDS: Lung cancer, Small cell carcinoma, Large cell carcinoma, Bronchoscopy, Programmed death receptor, PET-CT.

INTRODUCTION
The unchecked proliferation of lung cells is the hallmark of lung cancer. Physicians initially documented lung cancer in the middle of the nineteenth century. It was uncommon at the turn of the twentieth century, but by the century's conclusion, it had surpassed all other cancers in terms of mortality rates among men in over twenty-five industrialised nations. Lung cancer has surpassed all other cancers in terms of mortality rates since the turn of the century. In developed countries, it became the top cause of cancer death among women in 2012, surpassing breast cancer. Although rising levels of air pollution were also considered to have played a role, the fast rise in the global incidence of lung cancer was largely attributable to the increased smoking that followed World War I.[1] The most common cancer-related fatality worldwide is lung cancer. Part of the reason for this is that it usually doesn't create any symptoms until it's already progressed. Recent research has demonstrated that screening for lung cancer with low-dose computed tomography (LDCT) can reduce mortality rates, and the use of this technique is on the rise.[1,2] Lung cancer must be identified and graded as soon as suspicion arises; new guidelines have been developed to facilitate this procedure. Not long ago, there were no personalised medicines available; today, treatment is based on cancer subtype and stage.[2]

EPIDEMIOLOGY OF LUNG CANCER
Both new cases and deaths from lung cancer are on the rise worldwide. It was the most common cancer and the leading cause of cancer death in men and women combined in 2018, with an estimated 2.09 million new cases (11.6% of total cancer cases) and 1.76 million deaths (18.4% of total cancer deaths). These figures are higher than the 2012 reported rates (1.8 million new cases and 1.6 million deaths), 4,5 making it the third most common cancer type and the second leading cause of cancer death in women. Lung cancer rates and demographic distribution vary considerably across countries; these differences are influenced by factors such as cigarette smoking rates and economic development stage. With the recent rise in smoking prevalence in China, Indonesia, Eastern Europe, and Northern and Southern sections of Africa, the incidence of lung cancer is projected to rise in developing regions, even if cancer statistics in developing nations are less trustworthy.[3] More than half of lung cancer deaths happen in less developed nations, and as many as 80% of smokers today live in low- or middle-income countries. On the other hand, nations that "took up" smoking first and are currently executing effective smoking cessation and avoidance programmes should see a decline in lung cancer incidence.[4] Countries like this tend to have high per capita incomes; they include the US, UK, Nordic

nations, ANZ, Singapore, Germany, and Uruguay. Lung cancer in men accounts for the majority of new cases worldwide, but most nations are also seeing an uptick in female cases. Despite breast cancer's dominance worldwide, lung cancer claims the lives of more women than any other cancer in several regions, including the Americas, Western Europe, Australia, and New Zealand. Local smoking trends are probably to blame for the increased mortality rates in these places. Worldwide, 48% of males and 10% of women smoke, according to the World Health Organisation. While cigarette smoking rates are about the same for men in rich and developing nations, they are far lower for women in the former. When it comes to the development of lung cancer, non-smoking risk factors probably have a bigger impact in regions where women smoke less. Inhalation of smoke from charcoal, heating, or cooking may explain why the lung cancer incidence rate in China is comparable to that in many European nations, even though the smoking prevalence among Chinese women is lower.[3,5]

AGE

Males and females aged 70 and up have the highest risk of developing lung cancer. For males aged 40 and up and females aged 60 and above, lung cancer has surpassed all other cancers in terms of frequency of mortality. Lung cancer is most commonly diagnosed in those aged 70–72, with a median age of 72 for lung cancer deaths. Typically, the mortality rate from lung cancer rises with age up until about the age of 80 to 85, after which heart disease becomes the leading cause of death for both sexes, surpassing cancer.[6] Lung cancer is more common among young Hispanic and non-Hispanic white women (relative to men) between the ages of 30 and 49, according to a recent study. While the authors acknowledged that smoking behaviours did not fully account for the observed disparities, they did emphasise that smoking patterns probably contributed to this outcome. The fact that lung cancer is more common in younger women shows that our "traditional" understanding of the disease is evolving.[1,6]

ETIOLOGY

Lung cancer is primarily caused by smoking. Nearly all occurrences of lung cancer (about 90%) are attributed to cigarette smoking. Men who smoke are most in danger. Exposure to other carcinogens, such asbestos, increases the risk even higher. Due to the intricate interaction between smoking, environmental variables, and genetics, there is no association between the number of packs smoked each year and lung cancer. Exposure to secondhand smoke raises the risk of lung cancer by 20-30%. Radiation therapy for malignancies other than the lungs, such as breast cancer and non-Hodgkins lymphoma, is another consideration. Metal ions, polycyclic aromatic hydrocarbons, and chromium, nickel, and arsenic are all linked to an increased risk of lung cancer. Independent of smoking, lung disorders such as idiopathic pulmonary fibrosis raise the risk of lung cancer.[7]

Radon and asbestos are also known to increase the likelihood of lung cancer. The risk of lung cancer increases with asbestos exposure, especially in the workplace, and this risk varies with the kind of asbestos fibre and is dosage dependent. Less is known about the dangers of asbestos exposure in non-work settings. The tenants of a structure in which the asbestos is undisturbed and there are no respirable particles pose no major health risk, according to the United States Environmental Protection Agency (EPA), which has established standards for low-level tolerable nonoccupational asbestos exposure.[3] The risk of lung cancer was small but significant for uranium miners who were exposed to radon. As a byproduct of uranium and radium decay, radon can also build up in residential areas. Residential radon poses serious risks, especially to smokers, according to a review of European studies; it was found to be the cause of almost 2% of lung cancer-related fatalities in the region.[7]

CLINICAL MANIFESTATIONS

Concern for lung cancer should be raised in smokers or former smokers if they develop a new cough, as it occurs in around 50% of patients with lung cancer. Another red flag that could indicate a tumour as the underlying cause is a history of recurrent pneumonia in the same anatomical site or frequent worsening of chronic obstructive pulmonary disease. Direct malignant airway, parenchymal, or pleural involvement can cause dyspnea, which is experienced by about one-third to half of lung cancer patients. Additional complications that patients may experience include pneumothoraces, pleural effusions, pericardial effusions, and pulmonary emboli. Regional tumour invasion can cause chest pain, and involvement of the recurrent laryngeal nerve can cause hoarseness; these are other, less common symptoms—about 25% of patients with lung cancer present with hemoptysis, which is rarely severe. The superior vena cava syndrome, dysphagia, and arm/shoulder pain are further signs of intrathoracic dissemination that result from mass effects on different tissues. Extrathoracic metastases can also cause symptoms in patients. These symptoms, including lethargy, anorexia, and exhaustion, are often vague and difficult to diagnose. [8] Brain metastases are not always unpleasant, but depending on their size and location, neurologic complications may become apparent. On the other hand, bone metastases are more likely to cause discomfort. Hypercalcemia due to bone metastases or release of parathyroid hormone-related protein are among the paraneoplastic syndromes that can develop. Other neurologic syndromes that can emerge include Lambert-Eaton myasthenic syndrome and cerebellar ataxia.[9]

PATHOPHYSIOLOGY

There is still a lot we don't know about the complicated pathophysiology of lung cancer. People who smoke cigarettes or are exposed to carcinogens regularly may develop dysplasia of the lung epithelium. Protein synthesis and genetic alterations are consequences of

prolonged exposure. The cell cycle is thrown off and carcinogenesis is accelerated as a result. For small cell lung cancer (SCLC), the most common genetic mutations responsible for the development of the disease are MYC, BCL2, and p53. For non-small cell lung cancer (NSCLC), the most prevalent mutations are EGFR, KRAS, and p16.[6]

An integral aspect of identifying and controlling lung malignancies is histopathological classification, which relies on cellular and molecular subtypes.

There is predictive significance in determining histologic characteristics, invasion depth, and dissemination mechanism, according to the World Health Organisation (WHO). For instance, they recommend including information on tumour dissemination through air spaces in pathological evaluations because it increases the recurrence probability following restricted resections. Because they seem to be cytologic traits that can occur in any adenocarcinoma, the most current WHO classification also terminated the previously recognised clear cell, rhabdoid, and signet ring subtypes. To categorise malignancies that might not exhibit classic cytologic characteristics under light microscopy, the World Health Organisation (WHO) classification heavily relies on immunohistochemistry labelling. By analysing the expression of thyroid transcription factor 1, p40, and chromogranin and synaptophysin, the 2015 WHO classification system reclassified poorly differentiated carcinomas as squamous cell carcinomas, adenocarcinomas with solid subtype, and neuroendocrine carcinomas, respectively.[6,10]

Precursor Glandular Lesions

Adverse adenomatous hyperplasia (AAH) and in situ adenocarcinoma are two examples. AAH typically has a diameter of 5 mm or smaller and is a precursor lesion to lung cancer. Adenocarcinoma in situ is often a small, localised tumour that is less than or equal to 3 cm in size, and it can be mucinous or nonmucinous. There is a growth restriction along the alveolar structures, which is referred to as a "lepidic" pattern. It reveals intact alveolar septae and is non-invasive.[11]

Adenocarcinoma

Neoplastic gland development, pneumocyte marker expression (thyroid transcription factor 1 (TTF-1) with or without napsin expression), or intracytoplasmic mucin are the hallmarks of adenocarcinoma pathogenesis. The degree and structure of the neoplastic gland formation determine whether it is mucinous or nonmucinous, which further classifies it. Acinar, micropapillary, solid, lepidic, and papillary are subtypes that do not contain mucus. For prediction purposes, pathological confirmation of these subgroups is crucial. Cancer patterns that are solid, micropapillary, or cribriform (a subtype of acinar nonmucinous adenocarcinoma) are associated with poor prognoses. Mucinous adenocarcinomas can have a variety of architectures, including solid, micropapillary, papillary, and cribriform. However, the World Health Organisation does not advocate grading mucinous carcinomas based on tumour growth patterns. Less common types of adenocarcinoma include foetal, lymphoepithelial, enteric-like, and colloid.[12]

Minimally invasive adenocarcinoma (MIA) is characterised by its modest size, lack of invasion (less than 5 mm), and primary lepidic growth pattern. It resembles other precursor glandular lesions and is typically found in solitary tumours smaller than or equal to 3 cm. Adenocarcinoma with lepidic predominance is characterised as an invasion larger than 5 mm. Previously known as mucinous bronchioloalveolar carcinoma, invasive mucinous adenocarcinoma includes mucinous lesions that do not fit the MIA criteria. The lesion should be classed as mixed adenocarcinoma if it exhibits more than 10% of mucinous and nonmucinous development patterns.[13]

Adenosquamous Carcinoma

Tumours of the lung that contain more than 10% glandular and squamous cells are called adenosquamous carcinomas. Given the significant risk of recurrence and brain metastasis associated with this subtype, adjuvant chemotherapy with whole-brain postoperative preventive irradiation is recommended even in Stage I severely resected tumours of this uncommon and aggressive lung tumour type.[14]

Squamous Cell Carcinoma

When squamous cell pathology is present, it can be identified using immunohistochemistry (IHC) as p40, p63, CK5, CK5/6, or desmoglein expression, or by cytology findings of keratin and intercellular desmosomes. Nonkeratinizing, keratinising, and basaloid subtypes are all subtypes of squamous cell carcinoma. There is a lot of core necrosis and cavitation in squamous cell carcinomas. Pancoast tumours and hypercalcemia are two possible manifestations of squamous cell carcinoma. A tumour located in the superior sulcus of the lung is known as a Pancoast tumour. Recurrence of Pancoast tumours after surgery most commonly occurs in the brain.[15]

Large Cell Carcinoma

Malignant epithelial neoplasms that lack cytologic characteristics typical of glandular, squamous, or neuroendocrine malignancies are known as large cell carcinomas (LCCs). They do not have the hallmarks of small cell carcinoma in their cytology and do not usually express p40 and TTF-1 on immunohistochemistry. Round or polygonal cells with prominent nucleoli make up LCC in most cases. Large, featureless cytoplasmic cells characterise the organism. An exclusionary diagnosis is LCC.[14]

Sarcomatoid Carcinoma

Malignant epithelial components and characteristics suggestive of sarcomas characterise these uncommon

carcinomas. Pleomorphic carcinoma, pulmonary blastoma, and carcinosarcoma are subtypes.[12]

Small Cell Carcinoma

The cells that make up small cell carcinoma (SCLC) are small, roughly the size of a resting lymphocyte, and they can be round, oval, or angulated. They also contain a limited amount of cytoplasm. There are no visible nucleoli. There is a lot of necrosis in SCLCs. Typically, they show positive staining with synaptophysin or chromogranin. Oat cell, intermediate cell, and mixed cell (SCLC with NSCLC component, squamous, or adenocarcinoma) were the three cell subtypes that the WHO has previously identified for SCLC. Nevertheless, research has demonstrated that this categorisation lacks clinical relevance and predictive utility.[16]

BRIEF UPDATE ON THE EIGHTH EDITION TUMOR-NODE-METASTASIS CLASSIFICATION OF LUNG CANCER

In its eighth edition, some clinically important improvements have been made to the tumour-node-metastasis (TNM) classification for lung cancer. The "p" and "c" T-stage designators indicate the pathologic and clinical stages, respectively, out of a total of 24 T descriptors. The clinical size of a part-solid nodule is determined by the size of the solid component, whereas the pathologic size is determined by the size of the invasive component. In all T categories, tumour size is a descriptor, and prognosis changes with each additional centimetre of tumour size. The International Association for the Study of Lung Cancer suggests measuring tumour size in the lung window to guarantee reliable radiographic evaluation of the T stage. Tumours that have not spread beyond their original sites are now referred to as carcinoma in situ (Tis), whereas minimally invasive adenocarcinoma is known as T1a (mi). Even when complete atelectasis and pneumonitis are present, the prognoses of T2 and T3 endobronchial tumours are comparable. The reclassification of T3 tumours involving the diaphragm as T4 tumours has been accomplished.[17] As with the N component, clinical and pathological quantification of nodal disease is crucial. New subclass descriptors have been introduced for prospective testing and validation, in addition to maintaining the seventh edition N descriptors. A single pN1 nodal station will be indicated by pN1a, while numerous pN1 nodes will be assigned the value pN1b. For a single pN2 nodal station that does not involve pN1 (skip pN2), the designated node is pN2a1, and for a single pN2 node that does involve pN1, the designated node is pN2a2. Finally, pN2b will play a role in more than one pN2 node station. Lastly, the M component places a higher value on the total number of metastases than on their precise location. Disease patterns characterise cancers with many lesions. When there are several primary tumours, each tumour is given a TNM classification. Lung cancer patients will be able to benefit from more consistent tumour categorisation and better tumour stratification in upcoming studies thanks to these updates to the TNM classification system in the eighth edition.[18]

DIAGNOSIS AND STAGING

When diagnosing lung cancer, the two most common methods are flexible bronchoscopy and transthoracic sampling. Bronchoscopic access is typically used for lesions located in the middle third of the thorax, whereas transthoracic access is used for lesions located in the outside third. There appears to be a concentration of bronchoscopy services in big metropolitan centres in India, but overall, the number of these procedures has grown substantially over the last decade. Several pulmonologists provide comprehensive bronchoscopic services, including endobronchial ultrasonography (EBUS). Typically, interventional radiologists will use an ultrasound or CT scan to guide transthoracic sampling. But for now, just 1% of India's hospitals offer interventional radiology services.[19] Both modalities can access lesions in the middle one-third of the chest; which one is used depends on patient-specific characteristics and the availability of expertise. Radial EBUS, virtual bronchoscopic navigation, electromagnetic navigation bronchoscopy, and ultrathin bronchoscopy are some of the bronchoscopy techniques that can be used to sample peripheral lesions. Having said that, these bronchoscopic procedures are not easily accessible. A relatively new and promising method for transthoracic sampling is PET-guided biopsy. Notably, PET-CT's metabolic characterisation has the potential to improve diagnostic yield by enabling the targeting of live tissue during collection. Preliminary results showed that all patients could be diagnosed with thoracic lesions after PET-CT-guided biopsy, even when previous invasive samples had equivocal results. It is extremely important to collect enough samples for histologic and molecular characterization in cases of advanced disease, but this might be difficult to do, especially in smaller centres where specialists may be scarce. If sufficient tissue cannot be obtained for additional tests, a liquid biopsy for driver mutation detection could be useful. Noninvasive imaging staging is a common method for determining the local and distant spread of lung cancer in patients. When it comes to patients with resectable illnesses, noninvasive staging is crucial. The gold standard for noninvasive staging of lung cancer is a whole-body PET-CT scan. Staging evaluations typically incorporate magnetic resonance imaging of the brain since PET-CT is not sensitive enough for brain metastasis.[19,20] In centres without easy access to PET-CT, radionuclide bone scans are combined with contrast-enhanced CT scans of the upper abdomen, chest, liver, and adrenals. When determining a patient's stage, most Indian centres only use contrast-enhanced CT scans of the chest and upper abdomen. If a clinical examination does not indicate metastatic disease, PET-CT or magnetic resonance imaging of the brain is not typically performed. Mediastinal invasive staging is usually performed on most patients with resectable illness. Importantly, because of the risk of false-positive

findings, invasive mediastinal staging is typically used to confirm any indication of nodal involvement on imaging. In granulomatous disease-endemic nations like India, where tuberculosis is prevalent, it is particularly crucial to establish histological evidence of nodal involvement. Only a limited percentage of patients with peripheral stage IA illness who do not show signs of hilar or mediastinal involvement on PET-CT should undergo invasive mediastinal staging. In India, the approach varies. Although PET-CT may not always have a 100% negative predictive value, several centres nevertheless choose to do invasive mediastinal staging on all patients with resectable disease. However, some facilities choose to limit invasive mediastinal staging to patients in whom PETCT suggests the presence of N3 disease and instead promote liberal neoadjuvant chemotherapy (NACT) for all subjects with N2 illness on PET-CT.[21]

TREATMENT

Treatment of Non-Small Cell Lung Cancer (NSCLC)

Stage I

To treat stage 1 NSCLC, surgery is the gold standard. Either a lobectomy or a pneumonectomy combined with mediastinal lymph node sampling is the preferred technique. Of those with IA disease, 78% will survive 5 years, while 53% will survive IB disease. Patients without enough lung capacity to undergo lobectomy or pneumonectomy can have a less invasive procedure called wedge resection or segmentectomy. A higher local recurrence rate is the downside, although survival remains unchanged. There is no evidence that adjuvant chemotherapy or local postoperative radiation therapy improves outcomes in stage I cancer.[20]

Stage II

There is a 46% survival rate for stage IIA lungs and a 36% survival rate for stage IIB lungs. Adjuvant chemotherapy administered after surgery is the treatment of choice. When a tumour spreads to the chest wall, the best course of action is to remove the wall entirely at once. Among stage II tumours, the pancoast tumour stands out. Stage IIB or IIIA is typically used for the diagnosis of this condition, which originates in the superior sulcus. The standard approach to treating Pancoast tumours is neoadjuvant chemotherapy, which often includes etoposide and cisplatin, along with concomitant radiotherapy and subsequent tumour removal. There is a range of 44% to 54% overall survival after surgery, with the exact percentage depending on whether or not there was microscopic disease in the resected specimen.[21]

Stage III

Different tumour invasions and lymph node involvements make up this most diverse category.

Surgery aiming for a cure is the preferred treatment for stage IIIA illness accompanied by N1 lymph nodes. It is disheartening that many individuals are discovered to have an N2 illness during the resection process. The present agreement is to proceed with the scheduled surgery and then administer adjuvant chemotherapy. Patients with stage IIIA tumours and N2/N3 lymph nodes do not have a consensus on treatment. Concurrent chemo-radiotherapy provides the best result when the patient's performance condition is satisfactory and there has been no weight loss. However severe esophagitis and poor tolerability are side effects of concomitant chemo and radiation. Sequential treatment has a lower risk of side effects. While 40% to 45% of individuals make it through the first two years, just 20% make it through the fifth.

Chemoradiation is the standard treatment for tumour type 4 (T4). When tumours with carinal involvement are classified as T4 N0-1, surgery can be a possibility. Carinal resection has an operational mortality rate of 10% to 15% and a survival rate of about 20%. Surgery alone results in a five-year survival rate of 20% for tumours classified as T4 due to ipsilateral nonprimary lobe nodules without mediastinal invasion.[22]

Treatment for stage IIIB tumours involves concurrent chemo-radiotherapy, the same approach used to treat unresectable stage IIIA malignancies. After induction chemo-radiotherapy, surgery may be a choice for some patients. Because inoperable IA tumours were also included in the trials on the survival of people with IB tumours, the survival rate in patients with IBS remains unknown.[23]

Stage IV

The goal of treatment in stage IV disease is to increase survival rates and decrease symptoms, as the disease is regarded as incurable at this point. Chemotherapy only works on 10% to 30% of cancer patients, and survival rates after five years are 1% to 3%. Patients with a functional performance status can choose between chemotherapy regimens that use one or two drugs. Chemotherapy has a tiny survival advantage.

The use of bevacizumab, an inhibitor of vascular endothelial growth factor (VEGF), may be beneficial in extremely selected patients with non-squamous non-small cell lung cancer (NSCLC) who do not have hemoptysis or brain metastases.[24]

Targeted Therapy for NSCLC

Scientists learned in the new millennium that some mutations code for proteins that are essential for cell proliferation and DNA replication. They called these mutations "driver mutations," and the idea was that if we could find a method to stop them, lung cancer patients could have a better chance of survival. As it stands, all advanced NSCLCs are routinely tested for the following mutations. There is an inhibitor that targets each of these mutations specifically:

- The tyrosine kinase inhibitors erlotinib, gefitinib, and afatinib can block the mutation of the epidermal growth factor receptor (EGFR).

- Crisetinib, ceritinib, and alectinib are the particular inhibitors that make up ALK (Anaplastic lymphoma kinase). The ROS-1 mutation is structurally comparable. Recently, crizotinib was approved by the FDA for the treatment of malignancies that express the ROS-1 mutation.[25,26]

Immunotherapy for NSCLC

Immunotherapy works by enhancing the immune system's ability to detect and respond to cancer cells as foreign invaders.[27] Autoimmunity, in which the immune system destroys its cells, can be reduced by a series of checkpoints. Cancer cells take over these safeguards and train the immune system to ignore them. Programmed death receptor 1 (PD-1) stands out among these checkpoints as a subject of intense interest lately. One of PD-1's key functions is to encourage self-tolerance by down-regulating T-cells. On the other hand, it weakens the immune system's ability to fight tumour cells. Two proteins, PD-L1 and PD-L2, interact with PD-1. Activated T-cells become inactive as a result of this binding. Only PD-1 and its ligand, PD-L1, have antibodies that have been approved thus far. By binding to PD-L1 or directly inhibiting the PD-1 receptor, they stop the activated T-cell from being inactivated.[27,28]

An IgG4 monoclonal antibody that targets PD-1 is nivolumab. Once platinum-based chemotherapy has progressed, it can be used to treat both squamous and non-squamous NSCLC, according to FDA approval. Patients with either high or low PD-L1 expression status can utilise it. Another IgG4 monoclonal antibody that targets PD-1 is pembrolizumab. Patients with pre-treated metastatic non-small cell lung cancer (NSCLC) who express more than 50% PD-L1 and do not have EGFR or ALK mutations are eligible for this treatment. When used in conjunction with carboplatin and pemetrexed, it is effective against metastatic non-squamous NSCLC that expresses less than 50% PD-L1. An IgG1 antibody that targets PD-L1 is atezolizumab. It can be used either during or after platinum-based chemotherapy to treat metastatic, progressing NSCLC. Patients with EGFR and ALK mutations who do not respond to targeted therapy may benefit from this. There is no way to classify bevacizumab as an immune treatment. It blocks vascular endothelial growth factor A (VEGF-A), making it an anti-angiogenesis antibody. To treat non-squamous NSCLC, it is most commonly used alongside platinum-based chemotherapy. Severe and frequently deadly hemoptysis is a reason it is not recommended for squamous cell non-small cell lung cancer. Brain, kidney, colon, and breast cancers are among those that it helps treat.[21,28]

Small Cell Lung Cancer Treatment

Although treatment is effective against SCLC, the disease sadly recurs at a high incidence. The severity of SCLC treatment is proportional to the disease's progression.[23]

Treatment of Limited-stage Small Cell Lung Cancer

After a lobectomy, patients with stage I limited-stage small cell lung cancer (LS-SCLC) get adjuvant chemotherapy. One example is SCLC which shows up as nodules on the periphery rather than in the mediastinum or hilar lymph nodes. When ruling out lymph node involvement, it is important to be careful. In cases where PET-CT did not detect lymph node size or FDG uptake, the next step is to sample the lymph nodes using EBUS bronchoscopy or mediastinoscopy.[29]

Radiation treatment followed by four to six chemotherapy cycles is the standard treatment for LS-SCLC that involves mediastinal or hilar lymph nodes. Nearly 80% of SCLC will return locally without radiation therapy, hence it is recommended to avoid recurrence by undergoing radiation therapy. Concurrent and alternative chemo-radiotherapy, as well as sequential treatments, are among the many available options for treatment. While more harmful than other methods, concurrent and alternative pathways produce marginally better results. Sequential treatment has substantially fewer side effects.[27]

Additionally, patients who reach remission undergo preventative whole-brain radiation. Overall survival is increased, and the risk of symptomatic brain metastases is greatly decreased.[28]

Treatment of Extensive-stage Small Cell Lung Cancer (ES-SCLC)

Metastasis to other organs, cancerous fluids around the heart or lungs, and involvement of lymph nodes on the other side of the body are all symptoms of extensive stage small cell lung cancer (ES-SCLC). It is treated by chemotherapy that is based on platinum.[29] Prophylactic whole-brain irradiation should be considered after radiation treatment for individuals who exhibit remission rates of 50% to 60%. Eight to thirteen months is the median duration of survival after an ES-SCLC diagnosis, and fewer than five per cent of patients make it through the second year.[30]

CONCLUSION

In conclusion, the main point of the given text is that lung cancer is the leading cause of cancer death globally, with smoking being the primary cause but other factors also playing a role. Early detection and personalized treatment strategies are crucial in combating the high mortality rates associated with lung cancer. Additionally, the text highlights the clinical manifestations, pathophysiology, histopathological classification, and improvements in the TNM classification for lung cancer.

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