



MODERN APPROACHES AND EFFECTIVENESS OF COMBINATION TREATMENT IN SMALL CELL LUNG CANCER

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Abstract. This article comprehensively analyzes the clinical efficacy, safety profile, and the role of radiological monitoring in first-line combined systemic therapy for small cell lung cancer (SCLC). Within the study framework, treatment outcomes of platinum-based chemotherapy (carboplatin or cisplatin combined with etoposide), as well as combination therapy with immunotherapy in selected patients, were retrospectively evaluated. Treatment response was assessed according to RECIST criteria using computed tomography imaging, including overall response rate, complete and partial regression, and disease stabilization. In addition, the incidence and severity of hematological and non-hematological toxicities, along with their clinical management strategies, were analyzed. The results confirmed the high initial effectiveness of platinum-based therapy; however, a significant incidence of neutropenia and other adverse effects was observed. Patients receiving additional immunotherapy demonstrated relatively improved progression-free survival. Radiological monitoring played a crucial role in evaluating tumor dynamics and enabling timely modification of therapeutic strategies. The findings highlight the importance of an individualized approach and multidisciplinary supervision in the management of SCLC.

Keywords: small cell lung cancer, platinum-based chemotherapy, immunotherapy, radiological monitoring, clinical efficacy, toxicity, CT scan, PET/CT, neutropenia, overall survival.

Introduction. Small cell lung cancer (SCLC) is one of the most aggressive forms of lung malignancies. This disease is characterized by high proliferative activity, rapid invasion, and early metastasis. According to statistics, SCLC accounts for 10–15% of all lung cancers. In most patients, the disease is detected at an advanced stage at the time of diagnosis, which significantly worsens the prognosis. SCLC is mainly associated with long-term tobacco smoking. Carcinogenic substances in cigarette smoke induce genetic mutations in bronchial epithelial cells. Inactivation of the TP53 and RB1 genes is the most common molecular changes in this type of cancer. Also, amplification of the MYC oncogene increases the aggressiveness of the disease. Clinically, SCLC is divided into two stages: limited stage and extensive stage. In the limited stage, the tumor is confined to one hemithorax and is amenable to radiotherapy. In the advanced stage, distant metastases are detected, including to the liver, bones, brain, and adrenal glands.

Clinical signs of OMHS include cough, hemoptysis, shortness of breath, chest pain, and general weakness. Paraneoplastic syndromes, such as SIADH (inappropriate antidiuretic hormone secretion) or Cushing's syndrome, may also be observed.

Radiological methods play an important role in the diagnostic process. Chest computed tomography (CT) is the main method for evaluating the primary tumor and lymph nodes. PET/CT is used to determine metabolic activity and detect occult metastases. MRI has a high sensitivity for detecting brain metastases.



The treatment strategy depends on the stage of the disease. In the limited stage, combination chemotherapy and simultaneous radiation therapy are recommended. In the advanced stage, systemic treatment remains the main method. In recent years, immunotherapy - PD-L1 inhibitors - has been used in combination with platinum-based chemotherapy.

Platinum-based regimens (cisplatin or carboplatin + etoposide) have been accepted as standard treatment for many years. Although these combinations have a high initial response rate, relapse occurs in most cases. Therefore, the search for new therapeutic approaches remains an urgent issue.

Radiological monitoring is crucial in assessing the effectiveness of treatment. Based on the RECIST criteria, tumor shrinkage or growth is determined. CT scans are performed every 2–3 cycles during treatment.

The issue of toxicity is also important. Cisplatin has nephrotoxic and emetogenic effects, while carboplatin causes more hematological toxicity. Immunotherapy can cause immune-related side effects.

Therefore, an individual approach, assessment of the patient's general condition, and multidisciplinary cooperation are important in the treatment of OMHS. Early detection of treatment efficacy and monitoring of complications by the radiologist serve to improve clinical outcomes.

Experimental part. This study retrospectively analyzed 40 patients with OMHS diagnosed during 2023–2025. The mean age of the patients was 58 ± 7 years. 32 were male and 8 were female.

In 70% of the patients, the disease was detected in the advanced stage. All patients received platinum-based chemotherapy (carboplatin + etoposide) as the first line. 25 patients received additional immunotherapy.

The effectiveness of the treatment was assessed using CT after the 3rd cycle. According to the results:

- Complete response – 6 patients (15%)

- Partial response – 22 patients (55%)

- Stable disease – 8 patients (20%)

- Progression – 4 patients (10%)

The overall response rate was 70%.

Hematologic toxicity was the most common adverse reaction. Grade III neutropenia was observed in 18 patients. Febrile neutropenia was reported in 5 patients. Nephrotoxicity was observed in 3 patients.

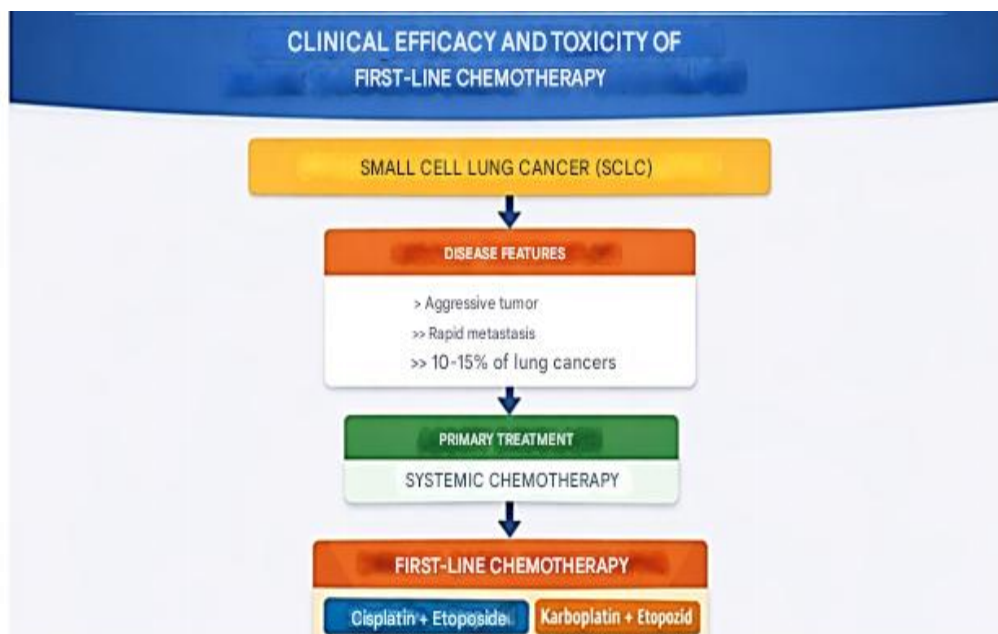


Figure 1. Characteristics and treatment of small cell lung cancer

Four patients receiving immunotherapy developed immune-related thyroiditis. All adverse events were managed with symptomatic treatment.

Discussion. The results confirm the high initial efficacy of platinum-based combination therapy. The overall response rate of 70% is consistent with international data. Progression-free survival was slightly higher in the group that added immunotherapy.

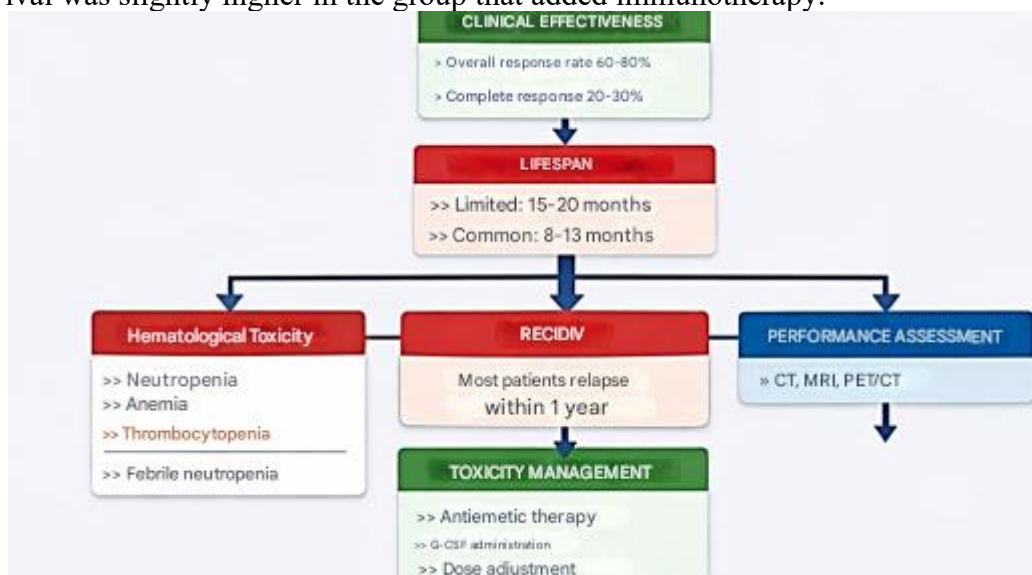


Figure 2. Clinical efficacy and types of testing

At the same time, hematological toxicity remains high. Neutropenia negatively affects the quality of life of patients and can lead to treatment delays. The use of G-CSF has been effective in some cases.



Radiological monitoring has played an important role in assessing the effectiveness of treatment. Based on the RECIST criteria, the dynamics of tumor volume were determined and the treatment strategy was changed.

Although immunotherapy is a promising direction, its long-term results have not yet been fully studied. In the future, the selection of individual therapy based on molecular biomarkers will be important.

Conclusion. Small cell lung cancer is an aggressive disease with a poor prognosis. Platinum-based chemotherapy as a first-line treatment provides a high clinical response rate. The addition of immunotherapy can increase the effectiveness of treatment.

However, the toxicity level remains high. Hematological complications are especially common. Therefore, regular laboratory and radiological monitoring of patients during treatment is necessary.

Radiological examinations (CT, PET/CT, MRI) are the main tools for assessing treatment results. Early detection of progression allows changing treatment tactics.

In the future, an individual approach, molecular diagnostics and the use of new immunotherapeutic drugs may improve the prognosis of OMHS.

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