World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-57 April, 2026
ISSN: 2749-3644

INTENSIVE CARE FOR HEPATOTOXIC AND NEUROTOXIC COMPLICATIONS OF CHEMOTHERAPY IN LUNG CANCER

Ergashev Nuriddin Hamzaevich
Gaziev Zoir Takhirovich
Umarova Kamola Ravshanovna
Tashkent State Medical University, Uzbekistan

Article history:

Received: 8th March 2026
Accepted: 7th April 2026

Abstract:

Chemotherapy remains one of the key methods for treating lung cancer; however, its use is limited by the development of toxic complications. The most clinically significant are hepatotoxic and neurotoxic reactions, which can lead to treatment interruption, reduced efficacy, and worse prognosis. This paper reviews current understanding of the pathogenesis of these complications, their clinical manifestations, and approaches to intensive care based on evidence-based medicine.

Химиотерапия остается одним из ключевых методов лечения рака легких; однако ее применение ограничено развитием токсических осложнений. Наиболее клинически значимыми являются гепатотоксические и нейротоксические реакции, которые могут привести к прерыванию лечения, снижению эффективности и ухудшению прогноза. В данной статье рассматривается современное понимание патогенеза этих осложнений, их клинических проявлений и подходов к интенсивной терапии, основанных на доказательной медицине

Keywords: Lung cancer, chemotherapy, hepatotoxicity, neurotoxicity, intensive care, polyneuropathy
рак легких, химиотерапия, гепатотоксичность, нейротоксичность, интенсивная терапия, полинейропатия.

Lung cancer is one of the leading causes of cancer-related mortality. Despite the introduction of targeted therapy and immunotherapy, cytotoxic drugs are still widely used both as first-line treatment and in combination regimens.

Chemotherapy-related toxic complications are an important clinical problem because they limit dose intensity and require treatment modification. The liver and nervous system are among the most vulnerable target organs.

The aim of this work is to analyze current approaches to intensive care of hepatotoxic and neurotoxic complications in patients with lung cancer.

Hepatotoxic complications are one of the most significant problems during chemotherapy in patients with lung cancer. The liver plays a central role in the metabolism of cytotoxic drugs, which makes it highly vulnerable to toxic injury. Hepatocyte damage may be caused by both direct cytotoxic effects of drugs and indirect mechanisms, including oxidative stress, mitochondrial dysfunction, and immune-mediated reactions.

In the pathogenesis of hepatotoxicity, activation of lipid peroxidation processes plays an important role, leading to damage of cell membranes and disruption of intracellular homeostasis. Another contributing factor is impaired bile flow, which promotes cholestatic changes. Some chemotherapeutic agents may cause fatty infiltration of the liver or even hepatocyte necrosis, which in severe cases can lead to liver failure.

Clinical manifestations of hepatotoxicity range from asymptomatic elevation of liver enzymes to severe clinical presentation with jaundice, asthenic syndrome, and signs of liver failure. The most common findings are elevated transaminases and bilirubin levels detected during laboratory monitoring. In some cases, symptoms may be minimal, which emphasizes the need for regular biochemical blood testing.

Intensive care for hepatotoxic complications is aimed at preventing progression of liver injury and restoring its function. First, correction of anticancer therapy is performed, including dose reduction or temporary discontinuation of the hepatotoxic drug. Infusion therapy plays an important role in detoxification and maintenance of fluid and electrolyte balance.

Hepatoprotective agents such as ademetionine and ursodeoxycholic acid are widely used to stabilize hepatocyte membranes and improve bile flow. Antioxidants are also used to reduce oxidative stress. In severe cases accompanied by liver failure,

World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-57 April, 2026
ISSN: 2749-3644

extracorporeal detoxification methods such as plasmapheresis and albumin dialysis may be applied.

Thus, hepatotoxic complications require a comprehensive approach including early diagnosis, patient monitoring, and timely intensive care. This reduces the risk of severe outcomes and allows continuation of anticancer therapy.

Hepatotoxicity is caused by:

- direct cytotoxic effects on hepatocytes;
- mitochondrial dysfunction;
- activation of lipid peroxidation;
- immune-mediated reactions.

Hepatotoxicity is most commonly associated with platinum compounds, taxanes, and antimetabolites.

Hepatotoxic complications of chemotherapy in lung cancer are characterized by a wide variety of clinical forms due to different mechanisms of liver injury and individual patient factors. Severity and pattern of damage may range from subclinical changes to life-threatening conditions.

The most common form is the cytolytic type, in which hepatocyte injury leads to elevated transaminases. This form may be asymptomatic and detected only by laboratory testing, although in some cases it is accompanied by weakness, reduced appetite, and discomfort in the right upper quadrant.

The cholestatic form is associated with impaired bile flow and is characterized by increased bilirubin and alkaline phosphatase levels. Clinically, it manifests as jaundice, pruritus, dark urine, and pale stools. This type is more often seen with drugs affecting the biliary system.

Fatty liver degeneration, or steatosis, is another form resulting from impaired lipid metabolism in hepatocytes. In most cases it is asymptomatic, but progression may lead to inflammatory changes and reduced liver function.

The most severe form is fulminant liver failure, which is rare but characterized by rapid deterioration of the patient's condition. It is accompanied by severe hyperbilirubinemia, coagulopathy, encephalopathy, and requires emergency intensive care in an intensive care unit.

Thus, clinical forms of hepatotoxicity are diverse and require careful differential diagnosis. Understanding their features allows timely treatment adjustment and prevention of severe complications.

Intensive care for hepatotoxic complications of chemotherapy in lung cancer is aimed at stabilizing liver function, preventing progression of hepatocyte injury, and avoiding liver failure. The approach must be comprehensive, individualized, and based on severity and the patient's overall condition.

A key step is timely correction of anticancer therapy. When signs of hepatotoxicity are detected, dose reduction or temporary discontinuation of cytotoxic drugs is performed, reducing further liver damage. In some cases, switching to alternative regimens with lower hepatotoxic potential is required.

Infusion therapy plays an important role in detoxification and maintenance of fluid and electrolyte balance. Crystalloid solutions improve liver perfusion and support elimination of toxic metabolites. Acid-base and electrolyte disorders are corrected when necessary.

Hepatoprotective agents are widely used. Ademetionine supports hepatocyte membrane repair and intracellular metabolism, while ursodeoxycholic acid improves bile flow and reduces cholestasis. Antioxidants reduce cellular damage by suppressing oxidative stress.

In cases of severe intoxication and progressive liver failure, extracorporeal detoxification methods are used, including plasmapheresis, hemoperfusion, and albumin dialysis. These methods help remove circulating toxins and improve biochemical parameters.

Continuous monitoring is an essential part of intensive care, including liver biochemistry, coagulation profile, and clinical status assessment.

Thus, intensive care is a multi-step process aimed at restoring liver function and preventing severe complications, improving prognosis and chemotherapy tolerance.

Neurotoxic complications are a common and clinically significant consequence of chemotherapy in patients with lung cancer. They significantly impair quality of life and often limit continuation of anticancer treatment. The peripheral nervous system is most commonly affected, although the central nervous system may also be involved.

Pathogenesis involves axonal damage, disruption of microtubule transport, and demyelination. Mitochondrial dysfunction and neuroinflammatory processes also play an important role. Cytotoxic drugs disrupt nerve impulse transmission, leading to sensory and motor deficits. The most pronounced neurotoxic effects are observed with platinum compounds and taxanes.

The clinical picture is most often represented by peripheral sensory polyneuropathy. Patients report numbness, tingling, and burning sensations in distal extremities. Paresthesias, dysesthesias, and neuropathic pain are common and may be persistent and debilitating. Disease progression may lead to motor impairment, reduced reflexes, coordination disorders, and balance problems. In some cases, cognitive impairment such as reduced memory and concentration is observed.

Intensive care for neurotoxic complications aims to reduce symptom severity and prevent further nerve

World Bulletin of Public Health (WBPH)
Available Online at: https://www.scholarexpress.net
Volume-57 April, 2026
ISSN: 2749-3644

damage. The first step is adjustment of chemotherapy, including dose reduction or substitution of neurotoxic agents.

Drug therapy includes neuroprotective agents such as B vitamins and alpha-lipoic acid. Neuropathic pain is treated with anticonvulsants such as gabapentin and pregabalin, as well as antidepressants with analgesic properties.

Supportive care includes correction of electrolyte imbalance and nutritional deficiencies. Rehabilitation methods such as physiotherapy and therapeutic exercise are important for functional recovery.

Thus, neurotoxic complications require a comprehensive and individualized approach. Early diagnosis and timely intensive care reduce neurological damage and improve treatment tolerance.

The intensive care unit plays a key role in managing patients with severe hepatotoxic and neurotoxic complications of chemotherapy in lung cancer. These conditions often lead to life-threatening disorders requiring continuous monitoring and advanced treatment.

The main goal of intensive care is stabilization of vital functions. In hepatotoxic complications, attention is focused on maintaining liver function, correcting metabolic disorders, and preventing liver failure. Hemodynamic status, acid-base balance, fluid and electrolyte levels, and coagulation parameters are monitored.

In severe intoxication, extracorporeal detoxification methods such as plasmapheresis, hemoperfusion, and albumin dialysis are used. In some cases, mechanical ventilation and vasopressor support are required to maintain hemodynamic stability.

In patients with neurotoxic complications, intensive care ensures neurological monitoring, early detection of progression, and management of central and peripheral nervous system disorders. Adequate pain control and prevention of immobilization complications such as thromboembolism and pressure ulcers are essential.

A multidisciplinary approach involving oncologists, intensivists, neurologists, and other specialists is crucial for optimal treatment and improved outcomes.

Thus, the intensive care unit is a vital component in the management of severe chemotherapy-related complications, improving survival and enabling continuation of anticancer therapy.

Hepatotoxic and neurotoxic complications significantly limit chemotherapy in lung cancer. Timely diagnosis and adequate intensive care reduce severity, improve treatment tolerance, and enhance clinical outcomes.

BIBLIOGRAPHY:

1. Чиссов В.И., Давыдов М.И. Онкология: национальное руководство. – М.: ГЭОТАР-Медиа, 2019. – 1072 с. – С. 642–658.
2. Каприн А.Д., Старинский В.В., Петрова Г.В. Злокачественные новообразования в России. – М.: МНИОИ им. П.А. Герцена, 2021. – 252 с. – С. 45–52.
3. Верткин А.Л., Талибов О.Б. Клиническая токсикология. – М.: МЕДпресс-информ, 2020. – 368 с. – С. 210–228.
4. Postma T.J., Vermorken J.B. Chemotherapy-induced peripheral neuropathy // Annals of Oncology. – 2015. – Vol. 26. – P. 240–248.
5. Friedman S.E., Grendell J.H., McQuaid K.R. Current Diagnosis & Treatment in Gastroenterology. – New York: McGraw-Hill, 2016. – 992 p. – P. 664–672.
6. National Cancer Institute. Common Terminology Criteria for Adverse Events (CTCAE) v5.0. – 2017. – P. 15–30.
7. ESMO Guidelines Committee. Management of toxicities from chemotherapy // Annals of Oncology. – 2020. – Vol. 31. – P. 119–134.
8. NCCN Clinical Practice Guidelines in Oncology: Non-Small Cell Lung Cancer. – Version 2024. – P. 85–102.
9. Windebank A.J., Grisold W. Chemotherapy-induced neuropathy // Journal of the Peripheral Nervous System. – 2008. – Vol. 13. – P. 27–46.
10. LiverTox: Clinical and Research Information on Drug-Induced Liver Injury. – Bethesda: NIH, 2022. – P. 112–130.