МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
БУКОВИНСЬКИЙ ДЕРЖАВНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ

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з міжнародною участю
професорсько-викладацького колективу
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Матеріали підсумкової 106-ї науково-практичної конференції з міжнародною участю професорсько-викладацького колективу Буковинського державного медичного університету (м. Чернівці, 03, 05, 10 лютого 2025 р.) – Чернівці: Медуніверситет, 2025. – 450 с. іл.

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POSSIBLE CONSEQUENCES OF MILITARY OPERATIONS FOR UKRAINE'S ENVIRONMENT DURING RUSSIAN AGGRESSION

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Introduction. The war in Ukraine, which is the result of Russian aggression, has been going on for almost 1,000 days and has a huge destructive impact on the environment. The hostilities led to the contamination of water, soil, and air with inorganic and organic pollutants, posing a threat to human health and the environment. According to preliminary estimates, Russian invasion caused direct infrastructure damage of more than €150 billion and €52.4 billion in environmental damage. This includes €27 billion in air damage, €23.6 billion in waste pollution damage, €1.5 billion in water damage, and €0.3 billion in soil damage. Daily damage to the environment from hostilities is estimated at €70 million. About 156.000 square kilometers of Ukraine's territory is mined with anti-personnel land mines, anti-tank mines, and other munitions.

The aim of the study. To analyze the possible consequences of hostilities during the Russian aggression on Ukraine's environment by literature search in relevant databases.

Material and methods. Original research articles, including book chapters, articles and review articles published in peer-reviewed journals, were used for the review. The terms "military actions", "Ukraine", "Russia", "war", "environment", "international humanitarian law", "ecocide" were used for the search. Bibliosemantic and information-analytic methods of analysis were applied.

Results. Deforestation, soil erosion, and biodiversity loss are the most pronounced environmental consequences of armed conflict in Ukraine. Battlefields are places of accumulation in the soil of potentially toxic elements due to the self-degradation of ammunition. In such places, there are also various organic pollutants such as polycyclic aromatic hydrocarbons (PAHs), explosive compounds and fuels, chemical warfare agents, polychlorinated biphenyls (PCBs), and per- and poly-fluoroalkyl substances (PFA). Bombs or heavy artillery affect the properties of the soil through the bombing process, which leads to changes in the landscape and soil structure. Another set of risks is related to contamination from industrial facilities that are damaged or unable to be properly managed due to hostilities like mines, chemical plants, and facilities that contain potentially hazardous substances. These, as well as infrastructure, including nuclear power plants, were often accidentally damaged or deliberately targeted during the conflict. The capture of the Zaporizhzhia nuclear power plant creates the risk of a long-term environmental disaster. The destruction of the Kakhovska Dam by Russian forces is ecocide and the worst environmental disaster in Europe and has long-term effects on the environment and public health.

Conclusions. To promote the adoption of specific measures to reduce the impact of armed conflicts on the environment, the international community has developed relevant recommendations of international humanitarian law, which determine the attitude to the environment during hostilities. It is the violation of these rules that leads to huge losses and destruction in the ecological system of Ukraine. Analyzing the possible short-term and long-term environmental consequences of hostilities with these facts in mind can help ensure appropriate response and effective measures in the current conflict.

Sydorchuk I.Y.

ANTIPHAGOCYTIC ACTIVITY OF CAUSATIVE AGENTS OF PURULENT-NECROTIC PROCESSES

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Introduction. The multiple impact of various artificial factors, which is typical for most countries, causes the prevalence and severity of purulent-necrotic processes in soft tissues. The last logically follows, as a consequence of the radical restructuring of the lifestyle, the breaking of natural stereotypes that have been formed for centuries. Such changes threaten the emergence of

various levels of immunodeficiency. In addition, the avalanche-like process of global urbanization, the rapid development of industry, and the associated pollution of the environment with pollutants, the wide spread of stressful situations - this is a far from complete list of sources of the formation of secondary immunodeficiency states of various levels in the population, which is a favorable condition for the formation, development and course of purulent-necrotic processes of soft tissues.

The aim of the work was to study the suppressive effect of causative agents of purulent-necrotic processes on the phagocytosis of neutrophil granulocytes and monocytes of peripheral blood.

Material and methods. The phagocytic activity of neutrophil granulocytes and monocytes of peripheral blood of 107 patients with purulent-necrotic processes was studied by the Petri dish method according to I.N. Dolgushyn and O.V. Bukharin. At the same time, the phagocytic activity was calculated as a percentage of cells involved in phagocytosis and the phagocytic number as an average number of staphylococci absorbed by one phagocytic cell.

Results. The greatest inhibitory effect on the capture of phagocytic particles was found in *Streptococcus pyogenes* (decrease in phagocytic number by 92.36%), *Staphylococcus aureus* (by 75.58%), *Prevotella melaninogenica* (by 74.57%), *Pseudomonas aeruginosa* (by 65.93%), *Bacteroides fragilis* (by 48.04%), *Proteus vulgaris* (by 40.47%), *Staphylococcus epidermidis* (by 37.90%) and other causative agents of the purulent-necrotic process of human soft tissues. *Staphylococcus saprophyticus* also inhibits the ability of neutrophil granulocytes to capture particles by 11.03%, but its inhibitory effect is statistically unreliable ($p>0.05$).

With the exception of *Staphylococcus saprophyticus*, all causative agents of purulent-necrotic processes in soft tissues suppress the phagocytic activity of neutrophil granulocytes to varying degrees. The greatest (by 65.42%) inhibitory effect on the phagocytic activity of neutrophil granulocytes was found in *Staphylococcus aureus, Streptococcus pyogenes* (by 60.89%), *Prevotella melaninogenica* (by 53.32%), *Pseudomonas aeruginosa* (by 40.06%), *Bacteroides fragilis* (by 36.70%), *Peptostreptococcus anaerobius* (by 34.55%). A low suppressive effect on the phagocytic activity of neutrophil granulocytes was established in *Escherichia coli* (by 16.13%), *Staphylococcus haemolyticus* (by 17.08%), *Enterobacter cloacae* (by 18.39%), and *Staphylococcus intermidians* (by 19.01%).

Conclusions. Conditionally pathogenic bacteria - the causative agents of purulent-necrotic processes of soft tissues have a suppressive effect on the phagocytosis system of neutrophil granulocytes, reducing phagocytic activity, phagocytic number and phagocytic capacity of patients' peripheral blood. The highest level of suppression of phagocytic activity was established in *Staphylococcus aureus* (inactivation by 65.42%), *Streptococcus pyogenes* (by 60.89%), *Prevotella melaninogenica* (by 53.32%), *Prevotella melaninogenica* (by 53.32%).

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POPULATION LEVEL OF PURULENT-NECROTIC PROCESSES CAUSATIVE AGENTS IN SOFT TISSUES

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Introduction. The problem of purulent-necrotic processes in soft tissues continues to occupy one of the key places in modern medicine. Statistics of developed and developing countries record a significant increase in the number of purulent-necrotic diseases caused by conditionally pathogenic microorganisms. Recently, the course of these diseases has become threatening due to great difficulties in the prevention and treatment of purulent-necrotic processes in soft tissues.

The aim of the work was to study the taxonomic composition, population level of causative agents of purulent-necrotic processes in soft tissues.

Material and methods. Microbiologically examined pathological material taken from foci of purulent-necrotic processes of soft tissues in 107 patients with abscess (29 patients), whitlow (28 patients), carbuncle (21 patients), purulent mastitis (21 patients), phlegmon (5 patients) and postoperative wound that suppurated (3 patients).