

## Means of Early Detoxification of the Irradiated Organism

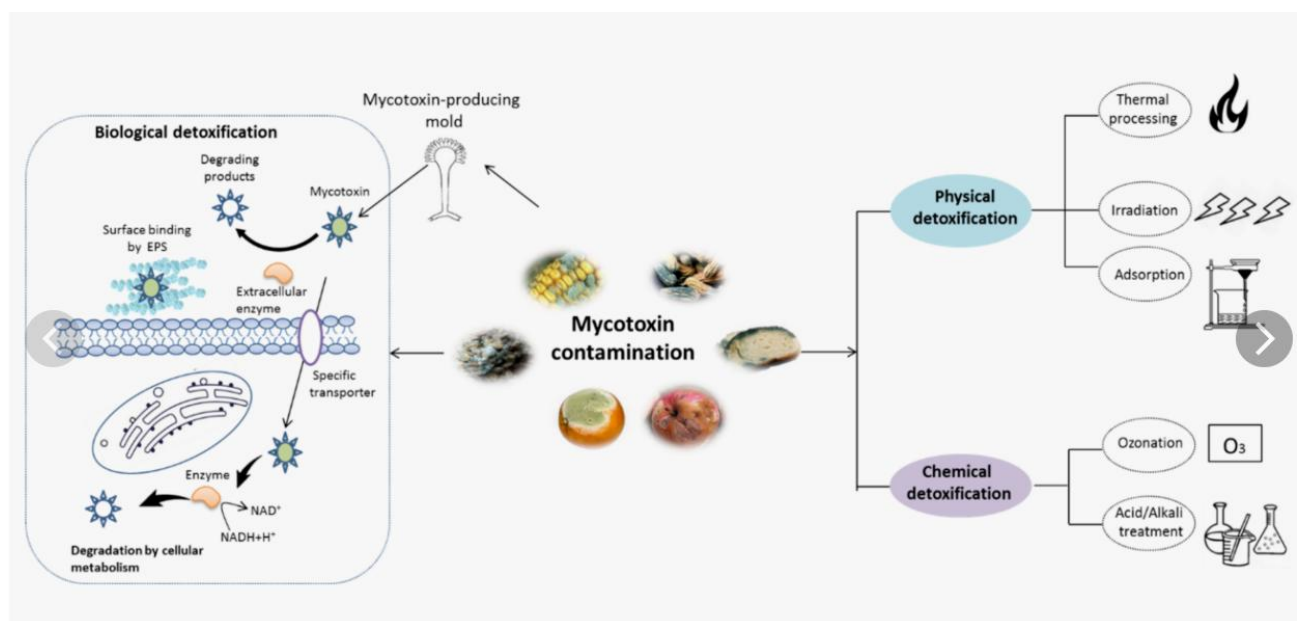
*Elmurotova Dilnoza Baxtiyorovna*<sup>1</sup>, *Kattaxodjayeva Dinara Utkurxodjayevna*<sup>2</sup>,  
*Ibragimova Gulzira Janabayevna*<sup>3</sup>, *Zaxidov Muhammad Shuxratbekovich*<sup>4</sup>

**Abstract:** This paper examines treatment options for exposure to ionizing radiation, which impairs the permeability of intestinal mucosa and vascular walls. It also clarifies that, in the event of radiation accidents at nuclear power facilities, all personnel receive iodine prophylaxis, regardless of the expected radiation dose.

**Key words:** treatment, ionizing radiation, permeability, radiation protection, radiation pathology, protection, individuality.

Early pathogenetic therapy for radiation injuries includes immunomodulators, adaptogens, reparative stimulants, and early detoxification agents. Exposure to ionizing radiation disrupts the permeability of the intestinal mucosa and vascular walls, leading to "radiation endotoxemia"—the release of toxic bacterial products from the intestines into the blood and lymph.

Endotoxemia is the primary cause of respiratory distress syndrome, **disseminated intravascular coagulation** (DIC), and hepatorenal syndrome that develop during the height of acute radiation sickness. Oral detoxification agents such as non-selective enterosorbents are highly promising early detoxification therapy in the first hours after irradiation.



It is known that already in the first hours to days after irradiation, the flow of endotoxins from gram-negative microflora from the intestine into the portal bloodstream and liver increases.

<sup>1</sup> Associate Professor, PhD, "Scientific and Technical Center for Radiation and Nuclear Safety" State Institution, Republic of Uzbekistan

<sup>2</sup> Senior Lecturer, Tashkent State Medical University

<sup>3</sup> Assistant, Tashkent State Medical University

<sup>4</sup> Student, Tashkent State Medical University



*Activated carbon* , *polyfam* , *smectite dioctahedral*, *carbon sorbent VUGS*, *polymethylsiloxane* and other enterosorbents significantly reduce the severity of post-radiation intestinal dysfunction, accelerate the elimination of toxic substances of histiogenic and bacterial origin from the body, ultimately increasing the survival rate of radiation victims.

For primary prevention, a dose of 0.1 g of enterosorbent per 1 kg of body weight is used, while for detoxification purposes , 1.0-4.0 g per 1 kg is used. An important and highly effective approach to early treatment of acute radiation injuries is the use of agents and methods that promote the immobilization of radiotoxins, their dilution, and accelerated elimination.

Plasma substitutes based on dextran (*polyglucin* , *neorondex* , *rheopolyglucin* , *rheogluman* ) are used intravenously by drip at 500-1000 ml per day, polyvinylpyrrolidone ( *hemodes -n*, *neohemodes* , *gluconeodes* ) at 300-500 ml per day [1].

of plasma substitutes with the lowest molecular weight is preferable . Continuity in early detoxification should be maintained : at the stages of qualified and specialized medical care, the above measures are supplemented by various types of extracorporeal detoxification , such as hemosorption and plasmapheresis .

If the expected irradiation of military personnel, units of the Ministry of Emergency Situations and the population is up to 5 mSv per year, medical anti-radiation protection equipment is not used.

In the event of radiation accidents at nuclear power facilities, regardless of the expected radiation dose, all personnel are given iodine prophylaxis: 1 potassium iodide tablet once daily for 7–10 days . If there is a risk of radioactive cesium incorporation, early administration of ferrocene, 2 tablets 3 times daily, is advisable .

As soon as possible after irradiation, plasma-substituting agents ( polyglucin , hemodez ) are administered infusions , and enterosorbents (activated charcoal, polyfam ) are administered orally. For absorbed doses greater than 1 Gy, subcutaneous administration of betaleukin at a dose of 1 mcg in 2 ml of saline is recommended .

Prevention of internal radioactive contamination is achieved by using respiratory protective equipment , prohibiting the consumption of untested food and water, and removing radioactive dust from clothing and skin (sanitary treatment).

Raddez D, Decontamin, and Zashchita can be used for sanitization. Mucous membranes of the eyes, nose, and mouth are rinsed with a 2% sodium bicarbonate solution, saline solution, or running water.



In all cases of development of symptoms of radiation injury after emergency care has been provided, the victim must be hospitalized in a hospital that has the capacity to provide specialized medical care [2-16].

The timely use of radiation protection medical devices not only prevents or alleviates the most pronounced and severe manifestations of radiation pathology but also significantly increases the



chances of survival for those affected. However, it is important to understand that the greatest effectiveness of radiation protection medical devices is achieved when used in combination with technical personal and collective protective equipment.

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