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THE IMPORTANCE OF NECROSIS IN THE HUMAN BODY

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Abstract: This article analyzes the concept of necrosis, its impact on the human body, causes, types, and clinical consequences from a medical-biological perspective. The clinical and morphological manifestations of necrotic processes, diagnostic methods, and modern treatment approaches are reviewed based on scientific evidence. Recommendations for the prevention of necrosis and support of regeneration processes are also provided.

Keywords: necrosis, tissue damage, infarction, inflammation, regeneration, treatment, prevention.

INTRODUCTION

Cells and tissues in the human body have a specific life cycle. In certain cases, under the influence of various factors, tissue destruction occurs—a pathological condition known as necrosis. Necrosis is the irreversible death of cells, leading to significant pathological changes in the body and serving as a cause for many diseases. This process is commonly observed in conditions such as cardiovascular diseases, infections, and trauma.

CAUSES OF NECROSIS

Necrosis develops due to various factors that disrupt the vital activity of cells in the body. These factors may impair energy supply, metabolism, and membrane integrity. The main causes of necrosis include:

Ischemia (disrupted blood supply): When oxygen and nutrients are not delivered to tissues, their function ceases. This condition arises in severe pathologies like myocardial infarction or stroke.

Inflammation: Severe bacterial or viral infections lead to the accumulation of necrotizing enzymes and toxins, causing cell lysis and tissue destruction.

Chemical agents and toxins: Certain drugs, industrial poisons, or acute poisoning can disrupt the internal environment of the cell, leading to cell death.

Physical factors: Extremely high temperatures (burns), frostbite, electric shock, or radiation exposure can cause necrotic changes in tissues.

Mechanical trauma: Injuries, prolonged pressure, or mechanical interruption of circulation (e.g., vessel compression) can result in necrosis.

One or more of these causes acting simultaneously can lead to severe necrotic processes. Therefore, identifying and addressing the underlying cause is a crucial step in treatment.

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TYPES OF NECROSIS

Necrosis types are classified based on the underlying cause, location, and tissue structure. Morphologically, the following major types are identified in clinical practice:

Coagulative necrosis: Common in dense, protein-rich tissues such as the liver, kidney, and heart muscle. Cells lose water, proteins denature, and tissues become firm. Often observed in myocardial infarction and renal ischemia.Liquefactive necrosis: Tissues soften and liquefy, forming a fluid mass. This occurs in fatty and soft tissues like the brain and spinal cord, typically seen in stroke.

Fat (enzymatic) necrosis: Occurs during pancreatitis when pancreatic enzymes digest fat cells, forming soap-like calcium deposits. Affected tissues appear pale and granular.

Gangrenous necrosis (gangrene): Develops when infection is added to necrosis. Gangrene is classified into three types:Dry gangrene: Tissue dehydration results in black or brown coloration, usually in toes or feet due to impaired circulation.Wet gangrene: Infected, pus-filled, and foul-smelling tissue.Gas gangrene: Caused by anaerobic bacteria (e.g., Clostridia), leads to gas accumulation and severe intoxication.

Sequestration: Typical for bone tissue necrosis where the dead bone segment separates from healthy tissue, often observed in osteomyelitis.

Understanding the morphological type of necrosis plays a key role in assessing disease severity, planning treatment strategies, and predicting outcomes.

MATERIALS AND METHODS

The study included 100 patients aged 18–60 diagnosed with necrosis through clinical and laboratory methods. Patients were divided into three groups:

1. Ischemic necrosis (e.g., myocardial infarction, stroke)

2. Infectious necrosis (e.g., gangrene, sepsis)

3. Trauma or chemically induced necrosis

Treatment lasted for 12 weeks. Effectiveness was evaluated based on clinical signs, laboratory parameters (C-reactive protein, leukocyte count), and overall patient condition.

RESULTS

Among the 100 patients, 55 were male (55%) and 45 were female (45%) with an average age of 38.6 ± 9.4 years.

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Table 1: Distribution of patients by age and gender

Gender	Number of Patients	Percentage (%)	Average Age (M ± SD)
Male	55	55%	39.2± 9.1
Female	45	45%	37.8± 9.7
Total	100	100%	38.6± 9.4

Before treatment, inflammatory markers (C-reactive protein) were elevated. After 12 weeks:

Group 1 showed a 60% reduction in symptoms.

Group 2 achieved 70% infection control.

Group 3 showed 75% positive dynamics in regeneration.

Table 2: Changes in inflammation markers

Group	Before Treatment (M ± SD)	After Treatment (M ± SD)
Group 1	16.5 ± 4.1	8.2 ± 2.3
Group 2	19.3 ± 4.8	7.1 ± 2.0
Group 3	15.7 ± 3.9	5.8 ± 1.7

DISCUSSION

The study confirmed the effectiveness of a comprehensive approach in the treatment of necrosis. In ischemic necrosis, restoring blood flow (thrombolysis, surgery) yielded good results. In infectious necrosis, antibiotics and necrectomy were the main strategies. In trauma-related necrosis, regenerative therapy and physiotherapy had positive effects. Due to limited resources in Uzbekistan, emphasis should be placed on early diagnosis and prevention.

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CONCLUSION

Necrosis is a severe pathological condition resulting in irreversible cellular and tissue death, significantly influencing the progression and prognosis of many diseases. It not only impairs individual organs or systems but also leads to systemic intoxication, weakened immunity, and life-threatening complications.

Modern medicine emphasizes early diagnosis of necrosis, accurate determination of its etiology, timely and appropriate treatment, and prevention of complications. Rehabilitation and stimulation of tissue regeneration also contribute to health restoration and improved quality of life.

In this context, in-depth study of necrosis, the use of advanced diagnostic and treatment methods, and a focus on preventive measures are of high relevance, leading to improved outcomes in medical practice.

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