Volume 3, Issue 12, December 2025 ISSN (E): 2938-3765

STUDY OF MORPHOLOGICAL CHANGES IN THE SPLEEN DURING EXPERIMENTAL MODELING OF CHRONIC RENAL FAILURE

Sobirov Sherzod Shodulloevich
Hasanova Dilnoza Axrorovna

Abstract
The prevalence of chronic kidney diseases and renal failure varies across regions and remains a serious and pressing issue in the field of public health. It is noteworthy that the clinical manifestation of chronic renal failure typically develops only after the loss of 70–75% of functional nephrons. As the condition progresses, the number of remaining nephrons continues to decline. The etiological factors underlying this pathology are highly diverse. They include congenital anomalies (for example, polycystic kidney disease, hydronephrosis, and renal hypoplasia) as well as acquired or unidentified inflammatory diseases (such as pyelonephritis and glomerulonephritis), drug-induced nephropathies (for instance, those caused by medications or amino acids), infections, metabolic disorders (such as diabetes mellitus), autoimmune diseases, and others [1,2].

Introduction

Despite the kidney's considerable compensatory capacity (even the remaining 10% of nephrons can sustain the body's water–electrolyte balance), the early stages of chronic renal failure are accompanied by quantitative disturbances in blood electrolytes, acidosis, impaired protein metabolism, and the accumulation of metabolic by-products such as urea and uric acid. To date, more than 200 substances with altered metabolism in renal failure have been identified [3].

Purpose of the Study

The aim of the research is to conduct a comparative analysis of age-related changes in the morphological and morphometric parameters of the spleen during chronic renal failure.

Materials and Methods

The obtained micro-specimens were examined using Hematoxylin–Eosin and Van Gieson staining techniques, as well as immunohistochemical analysis.

Pathological alterations in renal function lead to disruption of the stability of the body's internal environment (homeostasis). As the glomerular filtration rate decreases and uremia develops, metabolic processes slow down, modifying the transport and binding of numerous biologically active substances—including pituitary hormones—to their target cells.

Hemodialysis does not reduce the levels of prolactin, LH, or FSH; however, it normalizes the concentrations of growth hormone, IGF-1, and TSH. The levels of ACTH and vasopressin may either remain unchanged or decrease [4].

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

In patients with chronic renal failure, the response of lymphocytes to polyclonal activators is diminished. When patient cells are incubated not with autologous serum but with normal human serum, this response is partially restored. This indicates both a defect within the lymphocytes themselves and the presence of inhibitors in the blood serum that induce “immunological auto suppression.” In healthy individuals, the phenomenon of inhibited lymphocyte blastogenesis has been observed in vitro when plasma from patients with renal disease is added, suggesting the presence of an actively circulating immunosuppressive factor in these patients [5].

The spleen consists of two types of tissue: white pulp and red pulp. The white pulp contains lymphoid cells and white fibers that play a role in protecting the body’s immune system. The red pulp is composed of red blood cells, white blood cells, and platelets, participating in the formation and breakdown of blood. The spleen has a rich network of blood vessels, which constitutes an integral part of its structure and ensures a continuous blood supply [6]. These vessels also function in the removal of damaged or aged cells from the bloodstream. Overall, the spleen performs essential functions in immunity and hematopoiesis, making it a vital organ for maintaining health and well-being. Renal insufficiency can affect the spleen, as the kidneys and spleen are closely interconnected. Kidney failure may lead to alterations in the levels of iron, calcium, and other substances in the blood, potentially impacting spleen function.

Conclusion

Modern science is aimed not only at identifying and explaining developmental phenomena but also at controlling biological processes through the mechanisms that regulate them. Therefore, the study of tissue and organ relationships through morphology remains a relevant and promising field. In chronic renal failure, the level of vascular endothelial growth factor is particularly concerning due to the decreased glomerular filtration rate and the resulting vascular stiffness. Thus, chronic renal failure leads not only to dysfunction in all organs and systems of the body but also induces morphological changes in the spleen, rendering it a condition of both medical and social significance.

References

1. Abduraximov AX, Ergasheva ZA, Qosimova IK Korreksiya elektrolitnogo disbalansa pri xronicheskoy pochechnoy nedostatochnosti Rezyume //Akademik DS Seksenbaevti. 2019. – T. 80. – S. 76.
2. Avezova DB Morfologicheskie izmeneniya legkix 9-mesyachnix belix kris posle xronicheskoy pochechnoy nedostatochnosti //TADQIQOTLAR. UZ. – 2024. – T. 38. – №. 1. – S. 210-218.
3. Aydarov ZA va dr. Xronicheskaya pochechnaya nedostatochnost i serdechno-sosudistie zabolevaniya: muammo mejdissiplinarnaya // Ilmiy meros. – 2020. – №. 49-2. – S. 10-17.
4. Aringazina AM va doktor. Xronicheskaya bolezn pochek: rasprostranennost i faktori riska (obzor literaturi) //Analiz riska zdorovyu. – 2020. – №. 2. – S. 164-174.
5. Axmedova N., Amonov M. Viyavlenie faktorov riska i optimallashtirish ranney diagnostiki xronicheskoy bolezni pochek //Jurnal vestnik vracha. – 2020. – T. 1. – №. 3. – S. 26-31.
6. Batyushin MM Xronicheskaya bolezn pochek: sovremennoe sostoyanie problemi //Ratsionalnaya farmakoterapiya v kardiologii. – 2020. – T. 16. – №. 6. – S. 938-947 yillar.

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5