

EFFECTS OF MAGNETIC INFRARED LASER RADIATION ON RENAL TISSUE MORPHOMETRY IN ACUTE PYELONEPHRITIS

V.P. Avdoshin, M.Y. Gablia

Russian University of People Friendship, Moscow

Treatment of renal purulent inflammatory diseases remains a problem in urology. Despite good results of traditional therapies, the reported incidence of complications is fairly high. Newer methods for acute renal inflammatory conditions include magnetic infrared laser (MIL) therapy whose advantages are non-invasiveness, simplicity of use and low costs of equipment.

Documented effects of MIL therapy on body tissues are microcirculation improvement, palliation of edema and scar lesions, and immunomodulation.

This study presents electronographic findings in renal tissues of rabbits with induced acute pyelonephritis. Chinchilla rabbits were divided into four groups. Acute pyelonephritis was modeled in the first control group 1. The second control group 2 was intact rabbits; group 3 comprised rabbits with acute pyelonephritis treated with MIL and group 4 was given traditional antibacterial therapy. Tissue samples were obtained at 2, 4 and 7 days following the onset of infection.

Single-electronogram mitochondrial counts significantly differed in control groups, but proved unaltered in groups 3 and 4.

The single-mitochondrion cryst number was significantly reduced in acute inflammation, while no differences of this value were found at later phases in groups 3 and 4.

The surface area of one mitochondrion was significantly larger in group 1. MIL therapy produced no mitochondrial surface enlargement in group 3, while more extensive mitochondrial surfaces were seen in group 4 during initial days of inflammation, with subsequent contraction to values of group 3.

The single-mitochondrion energy effectiveness coefficient (EEC) was significantly increased by MIL therapy. Antibiotic treatment did not change EEC as compared to group 2. The single-electronogram EEC correlated with single-mitochondrion EEC.

CONCLUSIONS

Evidence of this study suggests that MIL therapy has an anti-edematous effect on cell organelles, helps retention of their fine structure, and enhances energy effectiveness of metabolism.