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Montelukast Protects against İschemia Reperfusion İnduced Funtional, Histological and Biochemical Changes in Rat Urinary Bladder

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INTRODUCTION

Ischemia reperfusion (I/R) injury is associated with oxidative stress, which promotes production of reactive oxygen species.

The aim of this study was to investigate the possible protective effect of montelukast, a CysLT1 receptor antagonist, against I/R injury of the rat urinary bladder.

METHODS

The abdominal aorta was clamped to induce ischemia for 1h, and then the animals were subjected to 1h reperfusion. Montelukast (10 mg/kg, ip) or saline was administered 30 minutes prior to I/R. After decapitation, the bladder was removed and used for contractility studies Briefly, bladder strips were suspended in oxygenated Tyrode buffer at 37^0C and isometric contractions to carbachol (CCh; 10^{-8}-10^{-4} M) were recorded. Furthermore malondialdehyde (MDA), an index of lipid peroxidation, glutathione (GSH) levels, a key antioxidant, and myeloperoxidase (MPO) activity, an indicator for neutrophil infiltration, were assayed in tissue samples. I/R injury was also evaluated histologically.

RESULTS

In the I/R group, the contraction of urinary bladder decreased significantly when compared with controls ($p<0.001$). Montelukast treatment of the I/R group restored these responses. In the I/R group, there was a significant increase in the MDA levels and MPO activity of the bladder tissue with marked reductions in GSH levels compared with controls ($p<0.001$). Montelukast treatment reversed these effects and also preserved histological changes observed in microscopical examination.

CONCLUSİONS

CysLT1 receptor antagonist montelukast, reversed I/R-induced oxidant responses, improved microscopic damage and urinary bladder function. It seems likely that montelukast protects urinary bladder tissue by inhibiting neutrophil infiltration, and balancing oxidant-antioxidant status.