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Evaluating the Effects of Tamsulosin, Pioglitazone, and their Combination on Adenine-Induced Chronic Kidney Disease in Wistar Rats: a Longitudinal Analysis at 4 And 7 Weeks.

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Objectives : Chronic kidney disease (CKD) is defined as a progressive decline in renal function lasting more than three months, with a global prevalence of 13.4%. This condition often leads to kidney damage and fibrosis, ultimately resulting in glomerular and tubular atrophy. The present study aimed to evaluate the effects of two pharmacological agents, tamsulosin and pioglitazone, known for their anti-inflammatory and antifibrotic properties, over 4 and 7 weeks.
Methods : Renal damage was induced in male Wistar rats by administering adenine for 4 weeks. Tamsulosin and pioglitazone were subsequently administered for 4 and 7 weeks. The therapeutic effects were evaluated through renal function tests, estimated glomerular filtration rate (eGFR), histopathological examinations, and molecular analyses.
Results : During the progression of CKD, the concomitant administration of the combined drugs demonstrated nephroprotective effects by significantly reducing the gene expression of key markers, including NF-κB, IL-1, and TGF-β. Histopathological analysis revealed a reduction in the extracellular matrix, and type I and III collagen. However, renal function, as assessed by the eGFR, was impaired. At 7 weeks, pioglitazone exhibited delayed but sustained effects, improving renal function as reflected by eGFR, compared to the combined drug group. Histological analysis revealed a reduced extracellular matrix, although the suppression of NF-κB, IL-1, and TGF-β gene expression was more significant at 4 weeks. A subsequent experiment combining both drugs with pioglitazone for up to 7 weeks, demonstrated notable renal function recovery, accompanied by a marked reduction in the extracellular matrix and type I and III collagen.
Conclusions : The combined treatment demonstrated anti-inflammatory and anti-fibrotic effects at 4 weeks by reducing the expression of key markers involved in the progression of CKD, although renal function remained impaired. In contrast, the administration of pioglitazone for up to 7 weeks significantly enhanced renal function and anti-fibrotic effects.

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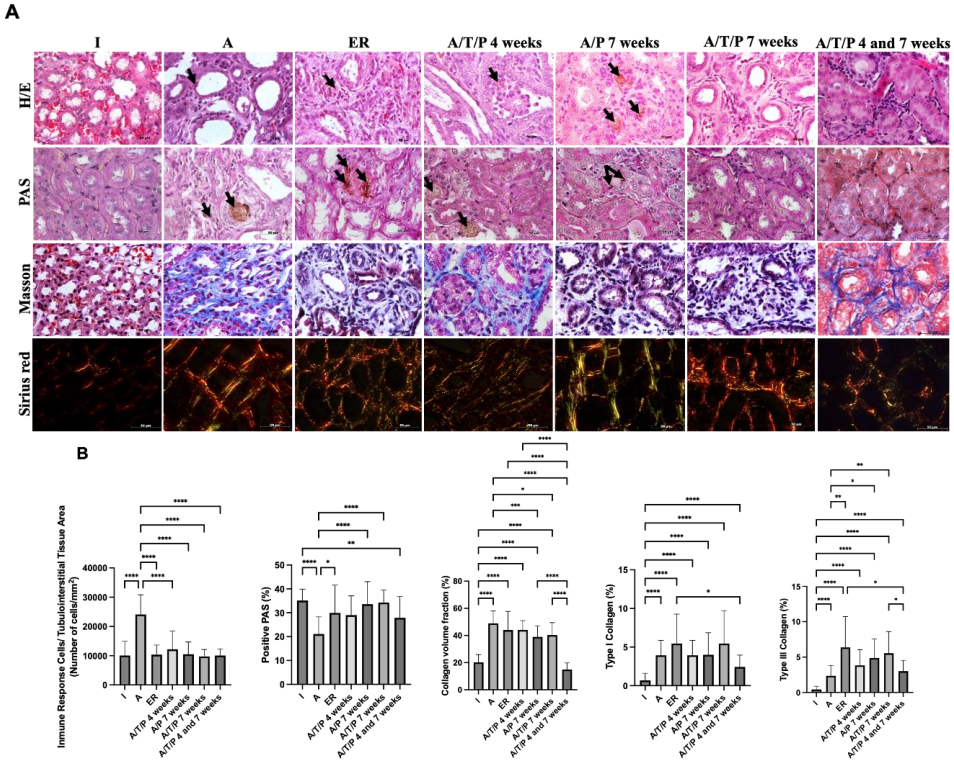

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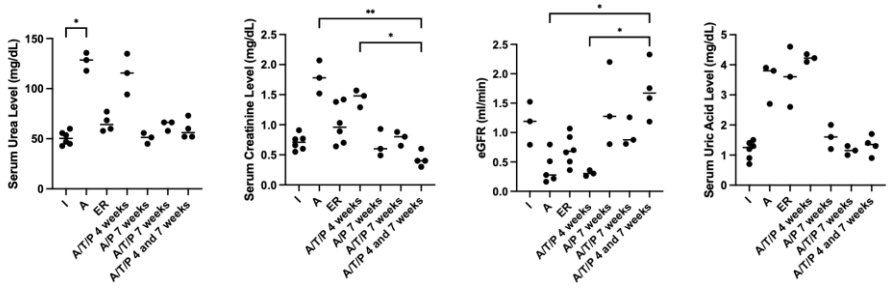

I: Intact; **A:** Adenine; **ER:** Endogenous reversion; **A/T/P 4 weeks:** Combinated treatment for 4 weeks; **A/P 7 weeks:** Pioglitazone treatment for 7 weeks; **A/T/P 7 weeks:** Combinated treatment for 7 weeks; **A/T/P 4 and 7 weeks:** Combinated treatment for 4 weeks and pioglitazone up to 7 weeks.