

KETAMINE ADMINISTRATIONS AFFECT AUTOPHAGOSOME NUMBERS OF UROTHELIUM IN RAT AND MODULATE CYSTITIS PATHOLOGY

Hypothesis / aims of study

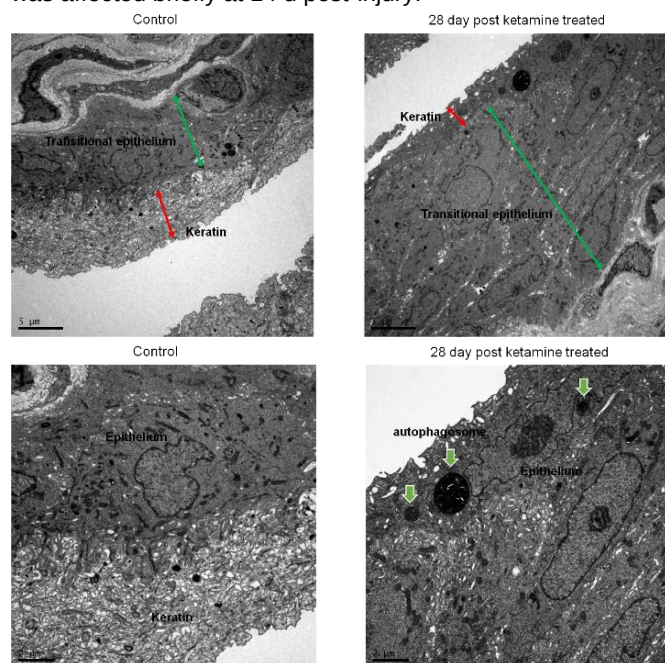
ketamine abuse affects the urinary bladder, resulting in an increase of urination frequency, urgency, nocturia, hematuria, and painful micturition and symptoms of cystitis, but its pathogenesis remains unclear. The present study was to investigate the impact of ketamine abuse induced ulcerative cystitis in rat urinary bladder under different time periods after ketamine administration and elucidate potential factors underlying ketamine effects.

Study design, materials and methods

Thirty-two rats were randomly divided into five equal groups which received saline or high dose ketamine (100mg/kg/day) for a period of 7, 14 and 28 days (d). In each group, cystometrogram was performed and paraffin-embedded sections were stained with Masson's trichrome stain and conducted transmission electron microscopy (TEM) in the bladder tissue.

Results

Ketamine-treated rats had increased urinary frequency and reduced urine volume compared to saline-treated rats at 14 d and 28 d. Histological study showed hyperplastic epithelium and severe atrophy of detrusor muscle layer at 14 d and 28 d after the ketamine-treated rat bladders. The barrier of the bladder tissue was affected briefly at 14 d post-ketamine treated. The ultrastructural analyses revealed increase of autophagosome at 14d and 28 d and lose of the adherence junction in smooth muscle at 28 d post-ketamine treated. Increased irregularity of the collagen was observed in the detrusor muscle layer 28 d post-ketamine treated. Apoptosis was significantly more abundant in the smooth muscle cells at 28 d post ketamine treated compared with control animals, and these cells were progressively replaced by collagen fibers. The endothelium of the corpus cavernosum was affected briefly at 14 d post-injury.



Interpretation of results

The autophagosome involved in the processes of autophagy which in the pathogenesis of disease. Previous study stated autophagosome formation during autophagy induction, and accumulates in the retraction bulbs early after spinal cord injury¹. Increase of autophagosome may be involved in the ketamine cystitis formation processes after ketamine treated.

Concluding message

Long-term ketamine administrations affect autophagosome numbers of urothelium in rat and modulate cystitis pathology, and this might play an important role in the pathogenesis of ketamine associated cystitis.

References

1. Ribas VT, Lingor P. Autophagy in degenerating axons following spinal cord injury: evidence for autophagosome biogenesis in retraction bulbs. *Neural Regen Res*. 2015 Feb;10(2):198-200.

Disclosures

Funding: No **Clinical Trial:** No **Subjects:** ANIMAL **Species:** Rat **Ethics Committee:** Fu Jen Catholic University Animal Care and Use Committee

