HISTOPATHOLOGICAL CHARACTERISTICS OF KETAMINE-ASSOCIATED UROPATHY AND THEIR CLINICAL ASSOCIATIONS

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Introduction

Urothelial denudation, submucosal lymphocyte and eosinophil infiltration was noted in bladder biopsy specimens in ketamine associated uropathy (KU) in previous case series [1]. However, comprehensive studies of the histopathological findings in entire bladder and ureters in KU and their correlation with the severity associated symptoms are scanty.

Methods

38 KU patients were enrolled in this study with provided detailed clinical histories and video urodynamic studies parameters. 13 of them was classified as clinically mild KU, undergone cystoscopic hydrodistention; whereas another 25 patients was classified as severe KU, undergone enterocystoplasty with or without ureter reimplantation [2]. Bladder and ureter specimens were obtained and stained with hematoxylin, eosin and immunohistochemical stain S100 for nerve hyperplasia distribution. The mucosa, muscle and subserosal layers of bladder and ureter were examined respectively. The severity of the histopathological findings was graded on a 4-point scale (0: none, 1: mild, 2: mild, and 3: severe), and it was correlated with clinical parameters, including visual analogue scale for pain (VAS), cystometric bladder capacity (CBC) and maximal bladder capacity (MBC) under general anesthesia.

Results

Inflammatory cells infiltration and nerve hyperplasia were found in the mucosa, muscle, and subserosal layers of the bladder and ureters in patients with KU. In mild KU, lymphocyte infiltration predominated. However, in severe KU, significant neutrophil, eosinophil, lymphocyte and plasma cell infiltrations were found in bladder mucosa.

(A) denuded epithelium (arrow head) with lymphocytes infiltration (100X) in mucosa, (B) nerve hyperplasia in mucosa (arrow head) (100X), (C) numerous neutrophil (arrow head) in mucosa(40X), (D) eosinophil (arrow head) and plasma cells (arrow) infiltration in mucosa (400X), (E) inflammatory cells infiltration and nerve hyperplasia in muscle layer (100X) and (F) inflammatory cells infiltration in serosal layers (40X).

Conclusion

Whole-layer nerve hyperplasia and inflammatory cell infiltration, including neutrophils, eosinophils, lymphocytes, and plasma cells were seen in KU patients. Moderate to severe neutrophil or lymphocyte infiltration in the bladder mucosa were associated more severe bladder pain and smaller bladder capacity. Histopathological examination is a useful tool to evaluate KU severity.

References


Disclosures Statement: None