Rare disease

Illicit ketamine and its bladder consequences: is it irreversible?

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Summary

Ketamine bladder is a new clinical entity that may lead to irreversible damage to the urinary system. We report the severe lower urinary tract symptoms of four young patients referred to our urology unit who were found to have ulcerative cystitis secondary to ketamine abuse. The pathophysiology remains unclear and the treatment is symptomatic.

BACKGROUND

Ketamine is a short-acting non-competitive *N*-methyl-D-aspartic acid receptor antagonist used as general anaesthetic as well as pain management in emergency medicine, palliative settings or when other methods fail with maximum dose of 600 mg/day orally.

Ketamine was synthesised in 1962, first used by humans in 1965¹ and licensed in 1970 by the United States Food and Drug Administration for the induction and maintenance of anaesthesia.² It started to be used as a recreational drug in the mid-1980s. It is known as special K or club drug and was classified as Class C drug in UK in 2006.

Ketamine is inhaled and it is available in the form of powder. It has been increasingly used by young adults for its effects of change in consciousness and psychotomimetic symptoms. Despite its known side effects of nausea, vomiting, tachycardia, tachypnoea, convulsion and hallucinations, it was found in the last few years that it has a major effect on the urinary system causing cystitis and bladder dysfunction. This was first documented in 2007.³

Ketamine metabolites are water soluble and 90% of them are excreted in the urine.⁴

CASE PRESENTATION

Case notes of four patients, who were initially referred to urology clinic for persistent lower urinary tract symptoms (LUTS) and were later found to be ketamine abusers, were reviewed. There were two men and women each aged between 20 and 46 years. They were on street ketamine for variable time with a maximum usage of 4 g/day in one of them.

All patients shared common urinary symptoms of dysuria, frequency, suprapubic discomfort and intermittent haematuria. They were treated in primary care with multiple courses of antibiotics for a period between 6 and 12 months before a specialist opinion was sought.

INVESTIGATIONS

Preliminary investigations including repeated urinalyses and showed no bacterial growth. There were no

significant ultrasound scan findings, but intravenous urogram showed a small bladder capacity in one patient. Cystoscopy showed features of ulcerative cystitis with small bladder capacity in all cases. One patient had a maximum bladder capacity of 150 ml only. Bladder biopsies in two cases confirmed extensive ulcerative cystitis, one of which also showed squamous metaplasia.

DIFFERENTIAL DIAGNOSIS

The differential diagnosis of ketamine bladder includes other conditions associated with LUTS.

TREATMENT

Current treatment strategies are directed to relief symptoms. It has been reported that pentosan polysulphate, intravesical sodium hyaluronate solution,⁵ antihistamine and corticosteroids⁶ may help with the symptoms. It was also suggested that symptoms are resolved with substitution cystoplasty.²

DISCUSSION

Ketamine's adverse effects on respiratory, cardiovascular and nervous systems are well known, but its effect on the urinary tract was recently revealed. It has become obvious that ketamine overdose is causing ulcerative cystitis.⁷

The actual mechanism is not well known yet, but these could be secondary to the toxic effect of ketamine and its metabolites, immune reaction or change in microvasculature.² The minimum dose of ketamine associated with LUTS and/or cystitis is not known yet, but there are no symptoms reported with the 600 mg daily dose for pain management, at least in our pain management clinic which leads to the conclusion, and replicates what others had found: it is dose and frequency related. Future malignant transformation remains unknown and needs follow-up of all similar cases. However, we had one case of metaplasia which is a premalignant condition.

Making healthcare professionals and public aware of ketamine urinary toxicity is necessary and early urology referral is recommended to avoid irreversible bladder

damage and possible long-term risk of malignancy. These patients need to be followed up regularly.

Learning points

- ▶ An emphasis should be made in taking social history in young patients present repetitively with urinary tract symptoms.
- ▶ Ketamine addiction can cause irreversible damage to the urinary system.
- ▶ General practitioners and other health workers should be, and make the public, aware of the consequences of ketamine addiction
- ▶ Early urology referral is advised to avoid irreversible damage.
- ▶ The available treatment is symptomatic and abstinence can prevent permanent damage.

Competing interests None.

Patient consent Obtained.

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