

Post-hysterectomy care: Sugammadex's role in reducing urinary retention

January 24 2024



Credit: *Biomolecules and Biomedicine*

A study titled "[Sugammadex and urinary retention after hysterectomy: A propensity-matched cohort study](#)," conducted by Mariana L. De Lima Laporta Miranda and colleagues from Mayo Clinic College of Medicine and Science, Rochester, MN, U.S., addresses a common postoperative challenge: postoperative urinary retention (POUR). The findings have been published in *Biomolecules and Biomedicine*.

Occurring in up to 25% of gynecologic surgeries, POUR significantly impacts [patient recovery](#) and [hospital stay](#). The study's focus is on sugammadex, a novel agent for reversing neuromuscular blockade, and its potential in reducing POUR risk compared to traditional agents.

Understanding POUR in gynecologic surgeries

Postoperative urinary retention (POUR) is a frequent and distressing complication, particularly in gynecologic procedures like hysterectomy. Various factors, including patient age, anesthesia type, and surgical duration, contribute to this condition.

Neuromuscular blocking agents (NMBAs) are essential for many surgeries, requiring careful pharmacologic reversal to prevent postoperative complications such as POUR.

Traditionally, this reversal involves cholinesterase inhibitors like neostigmine, combined with anticholinergic agents like glycopyrrolate to mitigate their muscarinic effects. However, sugammadex, a novel NMBA reversal agent without muscarinic activity, eliminates the need for anticholinergic coadministration.

Sugammadex vs. traditional reversal agents

In traditional NMBA (neuromuscular blocking agent) reversal, cholinesterase inhibitors like neostigmine are paired with anticholinergic agents such as glycopyrrolate to counteract side effects. Sugammadex, on the other hand, offers a distinct advantage. It reverses the effects of NMBAs without the need for anticholinergic coadministration, potentially playing a pivotal role in reducing POUR incidences.

This retrospective cohort [study](#) was conducted in a high-volume,

quaternary-care academic institution. It examined the rates of POUR in patients undergoing hysterectomy between 2012 and 2017.

The study included a total of 1,974 patients who underwent hysterectomy under general anesthesia. These patients were divided into two groups based on the NMBA reversal agent used: sugammadex or neostigmine-glycopyrrolate.

The primary outcome measured was unplanned postoperative bladder recatheterization, an indicator of POUR. After surgery, patients' urinary catheters were removed six hours post-operatively, followed by a passive voiding trial. POUR was defined as the inability to void postoperatively, necessitating unplanned new bladder catheterization within the first 24 hours.

Data collected included demographic characteristics, comorbid conditions, perioperative and postoperative data, surgical approach and duration, intravenous fluids, and medications. Additional outcomes such as the incidence of POUR, hospital length of stay, and postoperative complications like nausea, vomiting, and pain were also evaluated.

Statistical analysis was performed using inverse probability of treatment weighting (IPTW) to adjust for potential confounders. The analysis focused on assessing the association between the use of sugammadex and the frequency of POUR, employing logistic regression with robust variance estimates for data analysis.

Sugammadex shows promise

The study included 1,974 patients, of whom 1,586 (80.3%) received neostigmine-glycopyrrolate and 388 (19.7%) received sugammadex. The incidence of postoperative urinary retention (POUR) was notably lower in the sugammadex group at 18.3%, compared to 24.8% in the

neostigmine-glycopyrrolate group.

After adjusting for various factors, sugammadex was associated with a significantly lower risk of POUR, indicated by an odds ratio of 0.53. A particularly noteworthy finding was that sugammadex recipients who also received glycopyrrolate for reasons such as bradycardia treatment had a higher risk of POUR. This underscores the potential role of anticholinergic agents in the development of POUR.

Further analysis revealed an increased likelihood of POUR with higher doses of glycopyrrolate in the neostigmine-glycopyrrolate group. The postoperative course for patients with and without POUR was similar overall. However, those who developed POUR experienced more severe pain, higher instances of nausea and vomiting, and generally had longer hospital stays in certain surgical subgroups.

Changing the paradigm of postoperative care

This study's findings are in line with previous research, indicating sugammadex's effectiveness in reducing postoperative [urinary retention](#) (POUR) across various surgical procedures. The reduced risk of POUR associated with sugammadex could be due to the absence of anticholinergic agents, which are typically used in conjunction with neuromuscular blocking agent (NMBA) reversal.

This aspect is particularly significant considering the direct impact of hysterectomy on the genitourinary system, which inherently increases the risk of POUR.

The main observation of this study is the significantly lower risk of POUR when using sugammadex as opposed to neostigmine-glycopyrrolate for NMBA reversal after hysterectomy.

This aligns with findings from previous studies on different surgical procedures. The absence of anticholinergic agents during reversal with sugammadex is believed to be a key factor in this reduced risk. This finding is especially noteworthy due to the direct impact of hysterectomy on the genitourinary system.

However, the study's retrospective design and the timing of sugammadex's introduction during the study period are limitations that warrant a cautious interpretation of the results. These factors underscore the need for future randomized [clinical trials](#) to gain a more definitive understanding of these findings.

Toward improved post-hysterectomy outcomes

While the retrospective nature of the study and the introduction of sugammadex into [clinical practice](#) during the study period present limitations, the findings underscore the necessity for future randomized clinical trials. Such trials would provide more definitive insights into the role of sugammadex in managing POUR, potentially influencing future anesthetic practices in gynecologic surgeries.

The study highlights that sugammadex offers a promising approach to reducing POUR rates following hysterectomy by potentially eliminating the need for anticholinergic agents. This could represent a significant advancement in enhancing patient recovery and shortening hospital stays, thus improving the overall quality of postoperative care in gynecologic surgeries.

In summary, using sugammadex for NMBA reversal in hysterectomy patients is associated with a lower risk of POUR compared to traditional methods involving neostigmine-glycopyrrolate. This benefit likely stems from the avoidance of anticholinergic agents like glycopyrrolate, aligning with contemporary practice guidelines that advocate a more

conservative use of these agents.

While further research is needed, these findings have the potential to significantly impact postoperative care in gynecologic surgeries, leading to enhanced patient recovery and reduced hospital stays.

More information: Mariana L. De Lima Laporta Miranda et al, Sugammadex and urinary retention after hysterectomy: A propensity-matched cohort study, *Biomolecules and Biomedicine* (2023). [DOI: 10.17305/bb.2023.9569](https://doi.org/10.17305/bb.2023.9569)

Provided by Association of Basic Medical Sciences of FBIH

Citation: Post-hysterectomy care: Sugammadex's role in reducing urinary retention (2024, January 24) retrieved 13 May 2024 from <https://medicalxpress.com/news/2024-01-hysterectomy-sugammadex-role-urinary-retention.html>

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