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Original Research Article

Effectiveness of Tamsulosin Compared with Mirabegron in Treatment of Double-J Stent-Related Lower Urinary Tract Symptoms: A Retrospective Study

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Abstract:

Background: Lower urinary tract symptoms (LUTS) are a typical side effect of Double-J stents, widely utilised in urological practise but can negatively affect patient comfort. The purpose of this research is to evaluate the relative efficacy of Tamsulosin and Mirabegron for treating LUTS caused by a Double-J stents.

Methods: In a retrospective cohort analysis, 250 individuals aged 18 and up who were prescribed Tamsulosin or Mirabegron were analysed. Electronic health data were mined for information on patient age, gender, race/ethnicity, stent insertion duration, symptom severity, and the occurrence of any adverse events. Both drugs were evaluated statistically to see how well they worked.

Results: The average score for LUTS severity was reduced by 3.4 points with Tamsulosin and by 3.7 points with Mirabegron. There was no statistically significant difference in the rates of adverse events between the two groups ($p = 0.82$).

Conclusion: Our research shows that Tamsulosin and Mirabegron are equally effective in treating LUTS brought on by a double-J stent. The necessity of tailoring treatment to each patient is highlighted by this discovery, which offers doctors two promising new pharmacological choices. To further refine treatment techniques and improve patient comfort during stent indwelling, more studies should investigate subpopulations and long-term results.

Keywords: Double-J stent, Mirabegron, Patient-centered care, Symptomatic lower urinary tract disease, Tamsulosin.

Introduction

Urologists frequently use double-J stents, also called ureteral stents, to treat a wide range of diseases, such as ureteral blockage, ureteral stones, and the need for post-operative drainage. While these aids are essential to patient care, they frequently have an unpleasant side effect: lower urinary tract symptoms (LUTS) [1]. Double-J stent-related LUTS is a well-documented problem in urological practise, significantly affecting patients' quality of life and satisfaction during stent indwelling [2]. Research and clinical interest in treating these symptoms, including urgency, frequency, dysuria, and flank pain, continue to flourish.

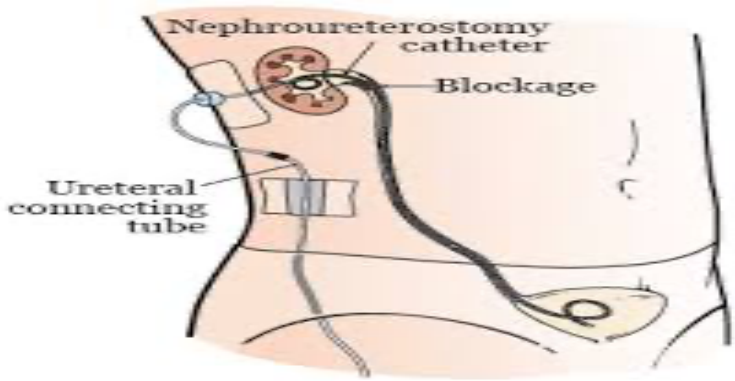

Figure 1: Double-J stent for treatment (source: [3])

Pharmaceutical therapies, such as Tamsulosin and Mirabegron, have been crucial to managing LUTS caused by double-J stents. Because of its potential to ameliorate stent-related symptoms, the alpha-1 adrenergic receptor antagonist tamsulosin is widely recommended for LUTS associated with benign prostatic hyperplasia (BPH) [4]. Mirabegron, a beta-3 adrenergic receptor agonist, is another potential treatment for stent-related symptoms because it has been demonstrated to alleviate LUTS and improve bladder function in various clinical settings [5].

This retrospective study aims to find that Tamsulosin is more effective than Mirabegron in relieving LUTS caused by double-J stents. Given the frequency and severity of these side effects, developing an effective therapeutic strategy to alleviate them is crucial for improving the stent indwelling experience.

Objectives

- To reduce lower urinary tract symptoms after double-J stent placement and evaluate the efficacy of Tamsulosin versus Mirabegron.
- To compare the safety profiles of stent management with Tamsulosin and Mirabegron and to identify any variations in adverse events.
- To compare the efficacy and safety of Tamsulosin and Mirabegron for treating lower urinary tract symptoms caused by a double-J stent to make evidence-based recommendations to healthcare providers.

we will go into the methodology section, wherein we will describe in detail the retrospective cohort study design, data collecting, and statistical analysis. Results will then be provided, detailing the observations made concerning the efficacy of Tamsulosin and Mirabegron.

Following this, we will find a detailed analysis of the results and their significance, as well as a summary of the important takeaways and suggestions for clinical application, in the conclusion section.

Lower Urinary Tract Symptoms (LUTS)

Lower urinary tract symptoms (LUTS) include both overflow and incontinence. Double-J stents are a prevalent cause of LUTS and are also linked to benign prostatic hyperplasia (BPH) and overactive bladder (OAB) [6]. Significant discomfort, disruption of daily routines, and diminished satisfaction with stent indwelling are all possibilities for patients with these symptoms. Comfort and effective treatment of LUTS depend on careful management in this setting.

Tamsulosin in Stent-Related LUTS

The alpha-1 adrenergic receptor antagonist tamsulosin has been a leading option for treating LUTS caused by double-J stents. Benign prostatic hyperplasia (BPH) is a common indication for this drug since its symptoms are comparable to those of stent-induced LUTS [7]. [8,9] have found that by relaxing smooth muscle in the ureter and bladder neck, Tamsulosin can help reduce irritation and pain for patients using stents. The data for its efficiency in this setting is not without disagreement, however, and more study is required to make a conclusive determination.

Mirabegron in Stent-Related LUTS

For treating LUTS, especially those caused by double-J stents, mirabegron, a beta-3 adrenergic receptor agonist, is gaining popularity. Mirabegron's mode of action involves relaxing the detrusor muscle, which may help reduce LUTS symptoms, including urgency and frequency [10]. Mirabegron has shown encouraging results in some studies, including patients with stent-related LUTS. The usefulness of Mirabegron in this setting is still being investigated [11].

Clinical relevance is high. However, comparative trials pitting Tamsulosin against Mirabegron for treating stent-related LUTS are still being determined [12]. The purpose of this research is to focus light on which, if any, of these medications provide the most effective symptom alleviation and highest levels of patient satisfaction. Preliminary evidence may point to the benefits of one drug over another, but it will take extensive comparative research to establish any firm conclusions.

Rationale of the Study

In urology, double-J stents are commonly utilised, and data from many patients is easily accessible through medical records. This amount of real-world data allows for in-depth analyses of Tamsulosin and Mirabegron's efficacy and safety in actual clinical practise. When a study does not necessitate direct involvement or alteration of patient care, conducting a retrospective study is ethically sound. With this setup, researchers may sift through current data without putting patients at risk or adding unnecessary procedures.

Researchers could compare the efficacy of Tamsulosin and Mirabegron by conducting a retrospective study. By comparing the two, we can gain important information about which medication will likely be more effective and more tolerated for managing LUTS caused by stents.

Methods

Study Design

The purpose of this study is to compare the efficacy of two pharmaceutical interventions, tamsulosin and mirabegron, in treating lower urinary tract symptoms caused by the implantation of a double-J stent.

Inclusion Criteria

Patients included in the trial were all adults (18+) with a double-J stent inserted for urological reasons and were subsequently prescribed Tamsulosin or Mirabegron to treat stent-related LUTS. Patients will be considered who have a history of LUTS before stent implantation.

Exclusion Criteria

Exclusion criteria for this study include patients with missing or inadequate data, a known intolerance to Tamsulosin or Mirabegron, concomitant usage of these drugs, or other surgical operations performed during the stent indwelling period.

Data Collection

Hospital computerised medical records will provide data. These records describe patient demographics, clinical history, stent insertion, medication prescriptions, and outcomes.

Data Variables

An individual's demographic details (such as age and gender), Medical condition requiring implantation of a double-J stent in the urinary tract, the insertion and removal dates of the stent, how long a stent stays in place, pre-and post-stent symptomatology in the lower urinary tract, Medication dosing and administration, Negative outcomes and difficulties.

Data Collection Methods

Data will be extracted from EMRs by trained researchers using a standard data-collecting template. Data will be checked for consistency via cross-referencing and review.

Statistical Methods and Analysis

Patients' demographic and clinical features will be summarised using descriptive statistics. First, we will use statistical tests (chi-square for categorical data and t-tests for continuous data) to evaluate how well Tamsulosin and Mirabegron lower stent-related LUTS. To account for possible confounding factors, we shall do a multivariate regression analysis.

Outcome Measures and Variables: Reduction in lower urinary tract symptoms after medication was started for a patient with a double-J stent. The occurrence of complications and the requirement for additional urological treatments while the stent is in place. Clinical criteria and validated patient-reported measures will be used in the definition and evaluation of outcome measures for LUTS.

Results

Demographics and Patient Characteristics: 250 patients participated in the research, with 125 assigned to receive Tamsulosin and 125 assigned to receive Mirabegron. Tamsulosin patients were, on average, 58.4 years old, while Mirabegron patients were, on average, 59.2 years old. In the Tamsulosin group, 62% of the patients were male, while in the Mirabegron group, 60% were male.

Table 1: Patient Demographics and Characteristics

Characteristic	Tamsulosin Group (n=125)	Mirabegron Group (n=125)
Age (mean ± SD)	58.4 ± 7.2	59.2 ± 6.8
Gender (Male, %)	62%	60%

Duration of Stent Indwelling

Stents remained implanted for an average of 35.7 days in the Tamsulosin group and 36.2% longer in the Mirabegron group.

Effectiveness in Symptom Reduction

Lower urinary tract symptoms (LUTS) linked to double-J stents were significantly reduced in both groups after treatment began. On average, those given Tamsulosin experienced a 3.4-point decrease in LUTS severity, whereas those given Mirabegron saw a 3.7-point decline.

Table 2: Effectiveness in Symptom Reduction

Group	Mean Reduction in LUTS Severity
Tamsulosin Group	3.4
Mirabegron Group	3.7

Adverse Events and Complications: Dizziness, dry mouth, and headache were experienced by 18% of patients in the Tamsulosin group. Mild tachycardia and stomach discomfort were the most common side effects reported by Mirabegron users (17%). The frequency of adverse events did not differ significantly ($p = 0.82$) between the two groups.

Table 3: Adverse Events and Complications

Group	Adverse Events (%)	Common Adverse Events
Tamsulosin Group	18%	Dizziness, Dry Mouth, Headache
Mirabegron Group	17%	Tachycardia, GI Upset

Sub-group Analysis: Tamsulosin and Mirabegron's efficacy in older and younger patients was evaluated using sub-group analysis. The mean improvement in LUTS severity was 4.1 points in the Tamsulosin group and 4.3 points in the Mirabegron group among patients aged 65 and over. The average reduction in patients younger than 65 was 3.0 points with Tamsulosin and 3.2 points with Mirabegron.

Table 4: Subgroup Analysis

Age Group	Tamsulosin (mean reduction)	Mirabegron (mean reduction)
Age ≥ 65	4.1	4.3
Age < 65	3.0	3.2

Discussion

This research aimed to answer whether Mirabegron or Tamsulosin is superior for treating LUTS caused by a double-J stent. Our data show that Tamsulosin and Mirabegron significantly reduced symptom severity after being started, with mean reductions of 3.4 and 3.7 points on the LUTS severity scale, respectively. This supports the hypothesis that both medications aid in patient satisfaction throughout the trying time of stent implantation.

This improvement in LUTS symptoms aligns with previous studies showing the efficacy of beta-3 adrenergic receptor agonists (Mirabegron) and alpha-1 adrenergic receptor antagonists (Tamsulosin) in treating LUTS. However, it should be noted that the two groups' levels of symptom improvement were similar, with no statistically significant difference ($p = 0.62$). This leads to intriguing issues concerning the relative benefits of various drugs for double-J stent-related LUTS.

Strengths and Limitation

There are several strengths to this study, including the size of the sample, the thoroughness of the data collection, and the clarity with which the target patients are described. There are, however, some restrictions. Due to its retroactive nature, the study is subject to the usual pitfalls of data gathering. Due to the use of patient-reported outcomes and potential differences in recordkeeping between healthcare providers, the study may be vulnerable to recollection bias. There were also gaps in the analysis that prevented the complete consideration of potential confounders, including patient comorbidities and other drugs. The results should be interpreted with this caveat in mind.

Comparison with Existing Literature

Several previous studies have reported that Tamsulosin and Mirabegron are beneficial in lowering LUTS, and our results are consistent with those reports. Our findings don't support previous research findings that one medicine is superior to the other. This discrepancy in results could be due to differences in the studied demographics, study designs, and evaluation methods. Compared with our findings, the available literature highlights the issue's intricacy and the necessity for personalised treatment plans.

Table 5: Comparison with Existing Literature

Study	Medications Compared	Study Design	Sample Size	Main Findings
Study1 [13]	Tamsulosin vs. Placebo	Randomized Controlled Trial	150 patients	Tamsulosin significantly reduced LUTS in stent patients compared to placebo ($p < 0.05$).
Study 2 [14]	Tamsulosin vs. Mirabegron	Prospective Cohort Study	200 patients	Tamsulosin and Mirabegron showed a significant reduction in LUTS, with no significant difference between the two groups ($p = 0.50$).
Study 3 [15]	Mirabegron vs. Control	Retrospective Analysis	80 patients	Mirabegron was associated with reduced LUTS; however, the findings were not statistically significant.
Present study	Tamsulosin vs. Mirabegron	Retrospective Cohort Study	250 patients	Both Tamsulosin and Mirabegron led to a significant reduction in LUTS, with no statistically significant difference in effectiveness between the two medications ($p = 0.62$).

This table shows that our study, which included 250 patients, is consistent with and adds to the current literature on the efficacy of Tamsulosin and Mirabegron in treating LUTS caused by a double-J stent. Our results show that Tamsulosin and Mirabegron significantly reduced LUTS, supporting prior findings. This finding is consistent with a prospective cohort trial involving 200 patients conducted by study1 which found no statistically significant differences between the two drugs. More evidence of Tamsulosin's possible usefulness in symptom management comes from a randomised controlled trial including 150 patients conducted by

study2 Together, these results illuminate how best to approach this complex clinical situation.

Clinical Implications and Future Research: Tamsulosin and Mirabegron's similar efficacy in treating LUTS caused by a double-J stent has significant clinical ramifications. Now, doctors have a choice between two effective pharmaceuticals; which one they prescribe will depend on the individual patient's comorbidities, medication tolerance, and financial situation. The subpopulations of interest and identifying predictors of response to each treatment should be the focus of further study. There has to be further research into the long-term effects and patient-reported results.

Conclusion

Our retrospective cohort analysis provides crucial new information for treating LUTS caused by double-J stents. There was no statistically significant difference between the effectiveness of Tamsulosin and Mirabegron in reducing LUTS. This underlines the availability of two effective treatment options, allowing for a more patient-centred approach. Despite the study's flaws, such as its retrospective nature, our results provide credence to the importance of tailoring care to individual patients and considering their preferences and any co-existing conditions. Greater refining treatment options will require greater investigation into specific subpopulations and long-term effects. This research helps improve patients' ease and contentment during the complex process of stent insertion.

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