International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Management of Benign Prostatic Hyperplasia with Overactive Bladder: Insights from Indian Clinical Practice

Dr. Goto Gangkak[1], Dr. Mukut Debnath[2], Dr. Ashok Kumar Gupta[3], Dr. Shyam Agrawal[4]

[1,2,3,4]Consultant Urologist, Department of Urology
[1]Ramakrishna Mission Hospital, Itanagar, Arunachal Pradesh, 791111, India.
[2]CMC Vellore Clinic, Agartala, Tripura 799001, India.
[3]Medant Hospital, Ranchi, Jharkhand 835217, India.
[4]Gokuldas Hospital, Indore, Madhya Pradesh 452001, India.

Benign prostatic hyperplasia (BPH) and overactive bladder (OAB) frequently present with overlapping lower urinary tract symptoms (LUTS). The association between BPH and OAB-related storage symptoms remains a significant clinical concern. Despite symptom overlap, OAB is often underdiagnosed and undertreated in men with BPH, emphasising the need for a more symptom-focused approach.
A survey was conducted among physicians to assess their clinical perspectives on the diagnosis, prevalence, symptoms and management of BPH with concomitant OAB. Physicians provided their insights, and data were analysed to identify trends in treatment strategies and physician preferences for combination therapy of Silodosin and Mirabegron.
The prevalence of OAB symptoms in BPH patients varied, with most physicians (49.6%) reporting a 40%–60% overlap. Frequent symptoms included urinary frequency (77.8%) and urgency (77.0%), followed by nocturia and urge incontinence. The diagnosis was primarily based on clinical history, urodynamic assessments and imaging. The combination therapy of Silodosin and Mirabegron emerged as the preferred treatment, with 82.5% of physicians endorsing its use. Combination therapy has been reported to improve symptom relief, enhance compliance and provide synergistic benefits. Patient adherence to treatment remained moderate, with 58.1% of physicians reporting adherence rates between 50% and 75%.
The findings highlight the complexity of managing LUTS in men with BPH and OAB. Although BPH is more frequently diagnosed and treated, the underdiagnosis of OAB necessitates improved awareness and targeted management. Combination therapy with Silodosin and Mirabegron offers significant symptomatic relief and is widely preferred by clinicians, highlighting its role in optimising treatment outcomes.

Abstract:
BPH is mainly identified as a histological condition. A significant challenge with BPH is the lack of a standardised definition with clearly defined sensitivity and specificity. This remains an unresolved issue. It is important to note that the prostate is not always the cause of LUTS in men. In many cases, LUTS are characterised by a combination of both obstructive voiding symptoms and storage symptoms (Figure 1), with the latter being typical of OAB. Notably, it is the storage symptoms—rather than the voiding symptoms traditionally linked to prostate enlargement—that are often the most troublesome for men with BPH.[2] This manuscript collates the experts' responses based on their clinical practice regarding diagnoses, symptoms and treatment of BPH with OAB.

Keywords: Benign prostatic hyperplasia; Bladder outlet obstruction; Lower urinary tract symptoms; Overactive bladder; Silodosin and Mirabegron; Voiding symptoms.

Introduction

Patients diagnosed with benign prostatic hyperplasia (BPH) often present with symptoms that overlap with those of overactive bladder (OAB), as both conditions can affect lower urinary tract symptoms (LUTS) and reduce quality of life, particularly in elderly patients.[1]

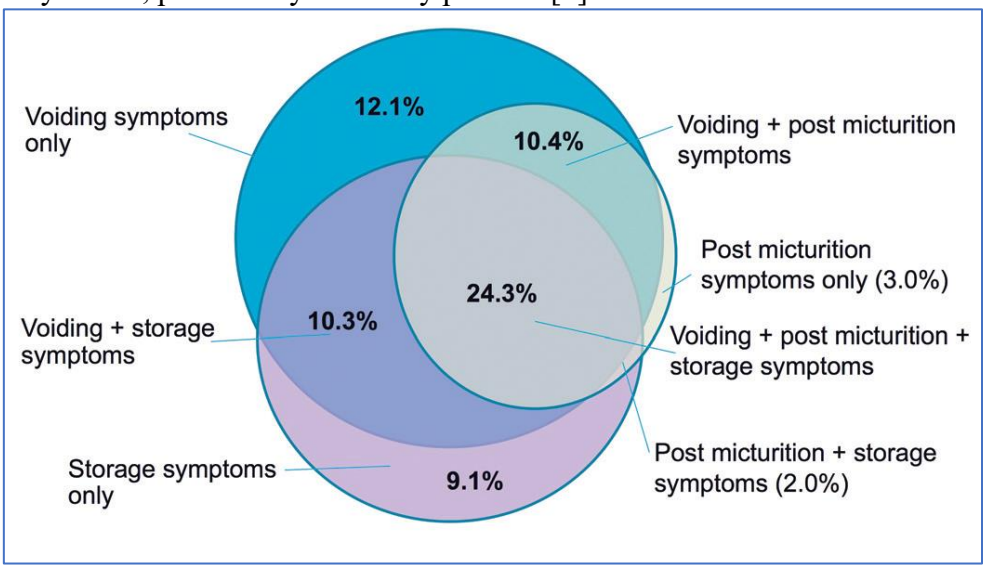

Figure 1. Men with both voiding and storage symptoms (Adapted from Chapple *et al.* 2011)[2]

Pathophysiology of BPE with LUTS and OAB

LUTS in men with BPE arise from obstruction-related changes in bladder function rather than directly from bladder outlet obstruction (BOO) itself. These obstruction-induced alterations can lead to detrusor overactivity (DO) or reduced bladder compliance, which clinically manifests as increased urinary frequency and urgency. Additionally, these changes may contribute to detrusor hypo-contractility, resulting in symptoms such as hesitancy, intermittency and a weaker urinary stream.[3]

A key factor linking storage LUTS in BPE and OAB is the bladder's diminished ability to accommodate increasing urine volumes during filling. Although the exact cause of OAB remains unclear, this reduced bladder accommodation is believed to heighten sensation, leading to urgency, frequency, and potentially urgency urinary incontinence (UUI). The role of OAB in storage LUTS is evident, as approximately one-third of men continue to experience significant voiding dysfunction—predominantly storage symptoms—even after surgical obstruction relief.[3] Moreover, only half of those with preoperative DO experience its resolution following transurethral prostate resection. This highlights the complex and not yet fully understood relationship between BPE, LUTS and OAB.[3]

1. Patients with BPH presented with symptoms of OAB

In clinical practice, the percentage of patients diagnosed with BPH who also present with OAB symptoms varies. Among the surveyed doctors, 62 (48.8%) reported that 20%–40% of their BPH patients have OAB symptoms, while 63 doctors (49.6%) observed this in 40%–60% of cases. A smaller proportion, 8 doctors (6.3%), estimated the prevalence at 60%–80%, and only 1 doctor (0.8%) indicated it to be greater than 80%. Two doctors (1.6%) did not respond to the question**.**

Studies suggest that up to 75% of men diagnosed with clinical BPH also exhibit urodynamic DO or clinical symptoms of OAB. Given the close association between lower LUTS and OAB, it is logical to consider similar symptom-focused treatment approaches for men. However, OAB symptoms in men are often attributed to BOO caused by BPH and managed accordingly.[4]

The limitations of prostate-specific treatments in many men with OAB symptoms, along with proven efficacy and safety of pharmacological interventions for DO in this group, have contributed to a recent shift in the treatment approach for male OAB. [4]

The EPIC study, a large-scale, cross-sectional survey conducted across 5 countries (Canada, Germany, Italy, Sweden, and the UK), examined adults aged 18 and older. Among over 19,000 participants, nearly 65% reported experiencing at least one LUTS. Storage symptoms were more common (51.3%) than voiding (25.7%) or postmicturition symptoms (16.9%). The overall prevalence of OAB was 11.8%. A secondary analysis of the EPIC study found that men with OAB symptoms experienced more LUTS and greater symptom severity than the general population. Additionally, the degree of symptom bother was correlated with the number of LUTS and urgency severity.[4]
BPH accompanied by LUTS is a prevalent condition, with its occurrence increasing with age. Various medical treatment options are available for managing BPH/LUTS.[5] However, more than half of patients with BPH/LUTS also experience OAB symptoms.[5] Among diagnosed individuals, 56.3% had only BPH, 13.8% had only OAB and 29.9% were diagnosed with both conditions.[6]

OAB symptoms—such as urgency, frequency, nocturia, and urge incontinence—are often more distressing than voiding symptoms and have a greater impact on quality of life.[5]
Management of OAB has primarily focused on addressing prostate enlargement, which contributes to voiding dysfunction and secondary OAB. However, treatment guidelines have evolved to prioritise the relief of bothersome symptoms, including OAB, rather than solely targeting prostate size.[5] Initiating treatment with a combination of alpha-blockers and anticholinergic agents is more effective in alleviating OAB symptoms compared to alpha-blocker monotherapy. [5]

Overlapping BPH and OAB

1. Common symptoms of overlapping BPH and OAB

Among patients with overlapping BPH and OAB, the most commonly observed symptoms include frequency, reported by 98 doctors (77.8%), and urgency, noted by 97 doctors (77.0%). Nocturia was identified by 80 doctors (63.5%), followed by urge incontinence, noted by 56 doctors (44.4%). Other symptoms included incomplete bladder emptying, reported by 33 doctors (26.2%), and weak stream, observed by 32 doctors (25.4%). Two doctors (1.6%) did not respond to the question.

Traditionally, both irritative and obstructive urinary symptoms in men were linked to BPH. However, it is now understood that irritative symptoms are mainly caused by OAB, characterised by urinary urgency, with or without incontinence.[6] The most common symptoms associated with BPH are LUTS.[7] LUTS can be categorised into obstructive and irritative symptoms. Obstructive symptoms include urine hesitancy, straining, weak stream, prolonged voiding, partial or complete urinary retention, and, in some cases, urinary incontinence. In contrast, irritative symptoms encompass urinary frequency, urgency, nocturia, dysuria and reduced voided volume.[7] LUTS can involve issues related to urinary storage, voiding or postmicturition symptoms. Storage symptoms include increased urinary frequency, urgency, nocturia and incontinence, while voiding symptoms include a slow, split or intermittent urinary stream, hesitancy and straining to void. Both storage and voiding symptoms in men have been mainly attributed to BPH, as the prevalence of both conditions increases with age. However, although voiding-related LUTS are more common, it is the storage symptoms that tend to be more distressing and socially disruptive.[3]

2. Diagnoses of BPH with concomitant OAB and gaps in the current diagnostic approach

For the diagnosis of BPH with concomitant OAB, the majority of doctors, 93 (68.4%), relied on clinical history, physical examination, basic laboratory tests and radiological assessments such as ultrasonography (USG). Post-void residual volume (PVR) measurement was used by 18 doctors (13.2%), whereas 12 doctors (8.8%) emphasised the stringent maintenance of a bladder diary. Digital rectal examination (DRE) and USG were used by 3 doctors (2.2%) and 8 doctors (5.9%), respectively. Urodynamic studies (UDS) were considered by 6 doctors (4.4%), and the International Prostate Symptom Score (IPSS), along with quality-of-life assessment, was used by 6 doctors (4.4%). Kidney, ureter and bladder (KUB) X-ray was utilised by 8 doctors (5.9%), and uroflowmetry (URF) by 5 doctors (3.7%). Increased frequency with

urgency and poor stream were noted as diagnostic indicators by 4 doctors (2.9%), while nocturnal volume assessment was used by 2 doctors (1.5%). Meanwhile, 2 doctors (1.5%) did not respond to the question.
Doctors identified several gaps in the current diagnostic approach for BPH with concomitant OAB. These include limited availability of UDS, which can hinder accurate assessment, a lack of patient awareness about symptoms and when to seek medical attention, and inadequate or incomplete history-taking, which may lead to missed or delayed diagnoses.
Diagnoses of BPH were more common than those of OAB, a trend also evident in treatment patterns. While the number of OAB diagnoses exceeded the frequency of OAB-specific treatments, the opposite was observed for BPH, where treatments were more frequently initiated following diagnosis. This suggests that OAB symptoms in men may be underdiagnosed and undertreated.[6]
Further analysis of treatments following initial interventions showed a significant increase in the use of OAB-specific medications and procedures. This could indicate that some symptoms were initially misdiagnosed and treated as BPH rather than OAB. Although the low frequency of OAB-specific treatments might reflect the use of behavioural or physical therapies, which align with current clinical guidelines, OAB remains widely recognised as an underdiagnosed and undertreated condition.[6]
These findings highlight the need to improve diagnostic clarity and encourage physicians to adapt tailored treatment approaches for patients presenting with various LUTS.
The diagnosis of BPH typically involves excluding other conditions that cause similar LUTS. These conditions include prostate cancer, prostatitis, bladder cancer, bladder stones, OAB, interstitial cystitis, and urinary tract infections, all of which can contribute to LUTS. Although BPH-related symptoms are generally not life-threatening, they can significantly impact a patient's quality of life. Therefore, an accurate diagnosis is essential to ensure appropriate treatment strategies are implemented.[7]
The American Urological Association (AUA) guideline panel has provided recommendations for diagnosing BPH.[8] According to these guidelines, patients experiencing LUTS that negatively affect their quality of life should undergo a basic evaluation. This evaluation may include several diagnostic components, as shown in Figure 2.[7] If the initial assessment indicates LUTS along with concerning findings such as abnormalities on a DRE suggestive of prostate cancer, haematuria, elevated prostate-specific antigen (PSA) levels, pain, recurrent infections, palpable bladder, or signs of neurologic disease, a referral to a urologist for further assessment is advised before initiating treatment.[7]

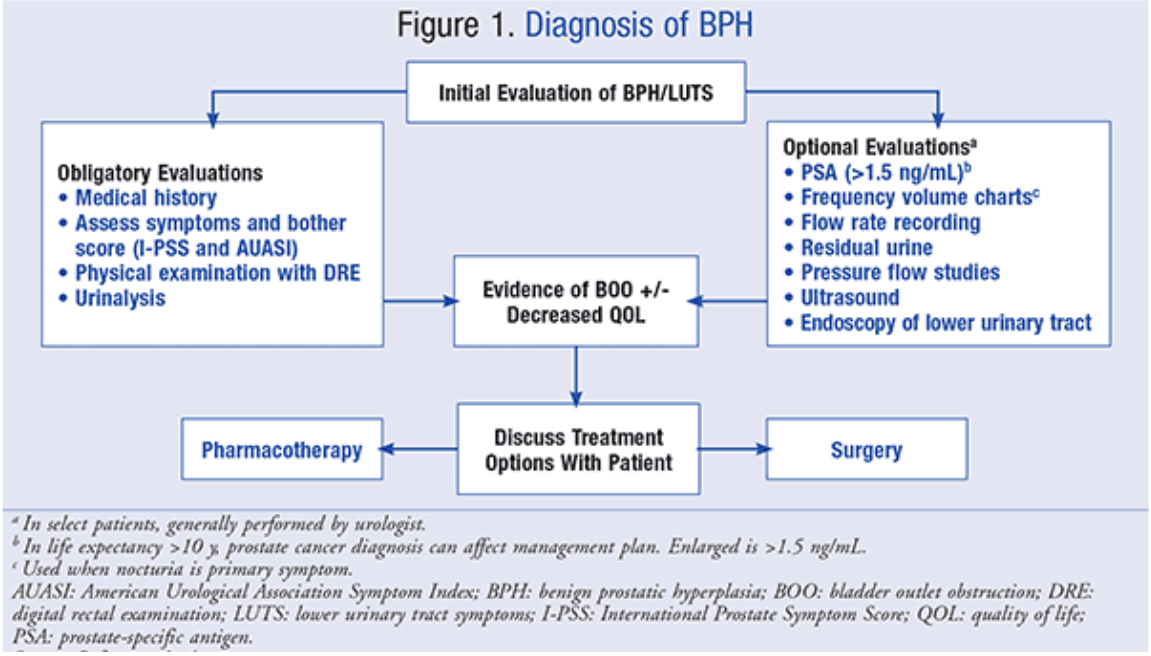

Figure 2. Diagnosis of BPH (Adapted from Davidian *et al.,* 2016)[7]

4. Pharmacological management of patients with BPH and OAB

The medical management of patients with BPH and OAB is predominantly conducted using the combination of Silodosin and Mirabegron, as reported by 104 doctors (82.5%). Silodosin and Solifenacin are used by 20 doctors (15.9%), while Tamsulosin and Solifenacin are prescribed by 6 doctors (4.8%). The combination of Tamsulosin and Tolterodine was not reported by any doctor. Other approaches, such as alpha-1 blockers along with pelvic floor exercises and Tamsulosin with Mirabegron, were mentioned by 1 doctor each (0.8%). Two doctors (1.6%) did not respond to the question.

The pharmacological approach to managing patients with both BPH and OAB has progressed to include combination therapies that target both conditions simultaneously. The primary pharmacological options for treating LUTS associated with BPO include alpha-blockers, which provide rapid symptom relief, and 5-alpha reductase inhibitors (5-ARIs), which help slow disease progression and manage symptoms in men at risk of worsening BPH.[9] Alpha-blockers are commonly used as first-line treatment; however, European Association of Urology (EAU) guidelines suggest using a combination of an alpha-blocker and a 5-ARI in men with moderate-to-severe LUTS and a high risk of disease progression.[9]

However, nearly 50% of men with LUTS experience both storage and voiding symptoms indicative of OAB and BPO. Among these, only about one-third achieve adequate symptom control with alpha-blocker monotherapy, while the rest require additional pharmacotherapy to address persistent storage LUTS. Clinical guidelines recommend supplementing treatment with either an antimuscarinic agent or a beta-3 agonist when storage symptoms persist despite alpha-blocker therapy.[9]

Silodosin and Solifenacin: Silodosin, an alpha-blocker, relaxes muscles of the prostate and bladder neck, aiding in urine flow.[10] Solifenacin, an antimuscarinic agent, helps reduce involuntary bladder contractions, alleviating OAB symptoms.[11] The combination of Silodosin and Solifenacin has shown significant benefits in women with OAB.[12]

Tamsulosin and Solifenacin: This combination has been extensively studied and is commonly used. Research has demonstrated that combining Tamsulosin with Solifenacin provides greater symptom relief compared to Tamsulosin alone in patients with BPH and coexisting OAB symptoms. Importantly, this combination does not substantially increase the risk of adverse events or acute urinary retention.[13]

Tamsulosin OCAS and Solifenacin Fixed-dose Combination (FDC): The FDC of Tamsulosin oral controlled absorption system (OCAS) 0.4 mg and Solifenacin 6 mg has been shown to significantly improve both storage and voiding LUTS compared to Tamsulosin monotherapy. Patients reported enhanced quality of life, and it was well tolerated, with no significant rise in the risk of acute urinary retention, despite increased PVR.[14]

Tamsulosin and Tolterodine:

The combination of Tamsulosin, an alpha-blocker, and Tolterodine, an antimuscarinic agent, is used to manage both BPH and OAB symptoms, following a similar approach to Tamsulosin and Solifenacin.[15] A randomised, double-blind, placebo-controlled trial found that after week 12, 80% of men receiving extended-release Tolterodine plus Tamsulosin reported treatment benefits compared to 62% on placebo ($P < 0.001$), 71% on Tamsulosin alone ($P = 0.06$ vs. placebo) and 65% on Tolterodine ER alone ($P = 0.48$ vs. placebo). Patients on this combination therapy experienced significant reductions in UUI ($P = 0.005$), urgency episodes without incontinence ($P = 0.03$), daily micturition frequency ($P < 0.001$) and nocturnal micturition ($P = 0.02$). Additionally, these patients showed marked improvements in total IPSS and quality of life scores ($P = 0.003$), while the incidence of acute urinary retention requiring catheterisation remained low.[16]

Silodosin and Mirabegron:

A newer treatment strategy involves combining Silodosin, an alpha-blocker, with Mirabegron, a beta-3 adrenoceptor agonist. This combination has been recognised as a highly effective option for managing BPH symptoms.[17] For OAB and UUI, pharmacological treatment options include either antimuscarinic agents or a beta-3 agonist, Mirabegron. In cases where monotherapy is insufficient, combining an

antimuscarinic agent with Mirabegron has shown efficacy and is recommended as an alternative strategy.[9]

5. Duration of combination therapy: Silodosin and Mirabegron

Among respondents, 1 (0.7%) recommended a duration of 10 days, and 3 (2.2%) suggested 15 days. A duration of 2 weeks was preferred by 5 (3.7%), and 4 (2.9%) recommended 3 weeks. Responses for longer durations included 6 weeks by 7 (5.1%), 8 weeks by 1 (0.7%), and 12 weeks by 1 (0.7%). One month was the choice of 21 respondents (15.4%), while 6 (4.4%) recommended 2 months. The most common response was 3 months, suggested by 48 (35.3%). Additionally, 1 (0.7%) recommended 4 months, 13 (9.6%) suggested 6 months, 2 (1.5%) opted for 12 months and 1 (0.7%) recommended 18 months. A duration of 1 year was suggested by 3 (2.2%), while 2 (1.5%) recommended 2 years. Meanwhile, 14 (10.3%) indicated that the duration of combination therapy depends on symptoms, patient needs, and can be lifelong. Lastly, 3 (2.2%) doctors did not respond to the question.

For patients with BPH and persistent storage symptoms, the combination therapy was evaluated for 8 weeks.[18]

6. Prescribing a combination therapy if monotherapy with either an α-blocker or Mirabegron has failed

The majority of doctors, 119 (87.5%), agreed with the use of combination therapy after the failure of monotherapy, while 3 doctors (2.2%) did not support it. Additionally, 2 doctors (1.5%) did not respond to the question. Other responses included screening for secondary associated factors such as uncontrolled diabetes (1 doctor, 0.7%), recommending pelvic floor exercises (1 doctor, 0.7%) and emphasising the importance of screening USG reports, particularly PVR and URF, along with clinical symptoms to guide further treatment decisions (10 doctors, 7.4%).

Doctors supporting the use of combination therapy after the failure of monotherapy cited several key reasons, including its effectiveness, better symptomatic improvement and enhanced patient compliance. They also highlighted that combination therapy addresses overactive and obstructive symptoms, offers better tolerance, provides synergistic effects for improved symptom management and serves as a quicker solution. Conversely, a few doctors who opposed combination therapy did not specify reasons for their decision.

7. Most effectively improved urinary symptoms associated with BPH and OAB by the combination therapy of Silodosin and Mirabegron

In clinical practice, the combination therapy of Silodosin and Mirabegron is considered most effective in improving all urinary symptoms associated with BPH and OAB, as indicated by 90 doctors (71.4%). Specifically, 29 doctors (23.0%) reported its effectiveness in reducing urgency and frequency of micturition, while 8 doctors (6.3%) highlighted its impact on lowering urge and incontinence. Additionally, 5 doctors (4.0%) noted its benefit in alleviating storage and irritative symptoms, and 2 doctors (1.6%) reported a reduction in nocturia episodes. Two doctors (1.6%) did not respond to the question.

The combination of Silodosin and Mirabegron therapy resulted in statistically significant improvements in storage symptoms, IPSS storage and quality of life as reported by patients.[18]

8. Side effects with the combination therapy of Silodosin and Mirabegron

The most common side effects of Silodosin and Mirabegron combination therapy were dry mouth, noted by 39 doctors (28.7%), constipation, reported by 34 doctors (25%) and headache, noted by 32 doctors (23.5%). Less frequently mentioned side effects included hypertension and palpitation, each reported by 4 doctors (2.9%). Additionally, dizziness (0.7%), obstructed flow (0.7%), postural hypotension (0.7%), anejaculation (0.7%) and nasal stuffiness (0.7%) were each reported by a single doctor. Notably, 2 doctors (1.5%) did not respond to the question.

9. Feedback from patients regarding the tolerability of the combination therapy

Patients' feedback on combination therapy revealed that 55 doctors (43.7%) reported an improvement in patients' quality of life. Additionally, 40 doctors (31.7%) observed a reduction in overall BPH-related symptoms, while 4 doctors (3.2%) noted that the therapy was non-tolerable over an extended period. Notably, 35 doctors (27.8%) indicated that all of the above factors were part of the patient feedback.

10. Adherence to the prescribed combination therapy regimen

Adherence to the prescribed combination therapy regimen was reported as follows: 15 doctors (11.6%) indicated that less than 25% of their patients adhere to the regimen, whereas 44 doctors (34.1%) stated that 25%–50% of patients adhere. The majority of 75 doctors (58.1%) reported an adherence rate of 50%–75%. Additionally, 2 doctors did not respond to the question.

11. More appropriate approach for managing patients with BPH and OAB

For the management of patients with BPH and OAB, 48 doctors (37.5%) preferred starting with Silodosin + Mirabegron and then shifting to either Silodosin or Mirabegron monotherapy. A larger group of 55 doctors (43.0%) recommended starting with the combination in patients who failed monotherapy. Furthermore, 29 doctors (22.7%) supported initiating Silodosin + Mirabegron exclusively in severe BPH with OAB cases. Two doctors (1.6%) suggested alternative treatment strategies. One recommendation involved combining an alpha-1 blocker with pelvic floor exercises, while another suggested initiating treatment with Silodosin monotherapy before transitioning to combination therapy. Additionally, two doctors did not respond to this question.

12. Combination of Silodosin and Mirabegron therapy as 'first-line' treatment

The majority of doctors, 100 (73.5%), indicated they would prescribe a combination of Silodosin and Mirabegron as first-line therapy for patients with obstructive LUTS, severe OAB symptoms, BPH with OAB and irritative symptoms.

Other reasons included urgency (8 doctors, 5.9%), urge incontinence (6 doctors, 4.4%), nocturia (4 doctors, 2.9%) and failure of monotherapy (4 doctors, 2.9%). Furthermore, 3 doctors (2.2%) would prescribe it for elderly patients with severe symptoms affecting their quality of life, 2 doctors (1.5%) for patients with an abnormal prostate size and 2 doctors (1.5%) based on IPSS values. One doctor (0.7%) mentioned using it for patients with BOH and Parkinson's Disease. Meanwhile, 4 doctors (2.9%) did not recommend it as first-line therapy, and 2 doctors (1.5%) did not respond to the question.

Conclusion

To summarise, the diagnosis and management of LUTS in males remain complex due to the overlapping symptoms of BPH and OAB. Our analysis highlights a potential gap in the recognition and treatment of OAB, despite its significant impact on patient outcomes. Notably, combination therapy with Silodosin and Mirabegron has emerged as a preferred approach among clinicians, offering substantial symptomatic relief and improving overall treatment effectiveness. This reinforces its critical role in improving LUTS management and patient quality of life.

Acknowledgments

We would like to acknowledge Scientimed Solutions Pvt. Ltd. for assistance in developing the manuscript.

REFERENCES:

1. Wang X., Yu Q., Michel MC., "Benign prostatic hyperplasia and overactive bladder: new members of metabolic syndrome", Frontiers in Urology, 2023 Aug 25; 3:1272592.
2. Chapple C., "Systematic review of therapy for men with overactive bladder", Canadian Urological Association Journal, 2011 Oct; 5 (5 Supplement 2): S143.

3. Moss MC., Rezan T., Karaman UR., Gomelsky A., "Treatment of concomitant OAB and BPH", Current Urology Reports, 2017 Jan; 18:1-7.
4. Dmochowski RR., Gomelsky A., "Overactive bladder in males", Therapeutic Advances in Urology, 2009; 1(4): 209-21.
5. Kim HJ., Sun HY., Choi H., Park JY., Bae JH., Doo SW., et al., "Efficacy and safety of initial combination treatment of an alpha blocker with an anticholinergic medication in benign prostatic hyperplasia patients with lower urinary tract symptoms: updated meta-analysis", PLoS One, 2017 Jan 10; 12(1): e0169248.
6. Burnett AL., Walker DR., Feng Q., Johnston KM., Lozano-Ortega G., Nimke D., et al., "Undertreatment of overactive bladder among men with lower urinary tract symptoms in the United States: A retrospective observational study", Neurourology and Urodynamics, 2020 Jun; 39(5): 1378-86.
7. Davidian MH., "Guidelines for the treatment of benign prostatic hyperplasia", U.S. Pharmacist, 2016; 41(8):36-40.
8. McVary KT., Roehrborn CG., Avins AL., Barry MJ., Bruskewitz RC., Donnell RF., "Update on AUA Guideline on the Management of Benign Prostatic Hyperplasia", Journal of urology, 2011; 185: 1793-1803.
9. Ali M., Landeira M., Covernton PJ., Choudhury N., Jaggi A., Fatoye F., Van Maanen R., "The use of mono-and combination drug therapy in men and women with lower urinary tract symptoms (LUTS) in the UK: a retrospective observational study", BMC urology, 2021 Dec;21:1-8.
10. Osman NI., Chapple CR., Cruz F., Desgrandchamps F., Llorente C., Montorsi F., "Silodosin: a new subtype selective alpha-1 antagonist for the treatment of lower urinary tract symptoms in patients with benign prostatic hyperplasia", Expert Opinion on Pharmacotherapy, 2012 Oct 1; 13(14): 2085-96.
11. Chilman-Blair K., Bosch JLHR., "Solifenacin: treatment of overactive bladder", Drugs Today (Barc), 2004; 40(4): 343–53.
12. Jeon BJ., Chang HK., Tae BS., Park JY., Yoon DK., Bae JH., "Efficacy of combined therapy with silodosin and solifenacin in females with overactive bladder", International Neurourology Journal, 2024 Dec 31; 28(4): 264.
13. Chen S., Wen H., Zhou B., Li J., "Therapeutic effect of solifenacin combined with tamsulosin on benign prostatic hyperplasia with overactive bladder", International journal of clinical and experimental medicine, 2018 Jan 1; 11(12): 13820-6.
14. Dimitropoulos K., Gravas S., "Solifenacin/tamsulosin fixed-dose combination therapy to treat lower urinary tract symptoms in patients with benign prostatic hyperplasia", Drug design, development and therapy, 2015 Mar 19:1707-16.
15. Athanasopoulos A., Gyftopoulos K., Giannitsas K., Fisfis J., Perimenis P., Barbalias G., "Combination treatment with an α-blocker plus an anticholinergic for bladder outlet obstruction: a prospective, randomized, controlled study", Journal of Urology, 2003 Jun 1; 169(6): 2253-6.
16. Kaplan SA., Roehrborn CG., Rovner ES., Carlsson M., Bavendam T., Guan Z., "Tolterodine and tamsulosin for treatment of men with lower urinary tract symptoms and overactive bladder: a randomized controlled trial", Journal of the American Medical Association, 2006 Nov 15; 296(19):2319-28.
17. Manjula S., "Expert opinion on the prescription practices of silodosin and combination therapies in the management of benign prostatic hyperplasia in Indian settings", International Journal of Advances in Medicine, 2024; 11:94-8
18. Somarendra K., Lodh B., "Efficacy of mirabegron add-on therapy to silodosin for the treatment of persistent storage symptoms in patients with benign prostatic hyperplasia", Journal of Population Therapeutics and Clinical Pharmacology, 2024; 31(2): 1981–4.