must be evaluated individually, and the treatment course must be tailored to the patient's individual situation.

α-Adrenergic Antagonists

α-Blockers are the most commonly prescribed medications for the treatment of LUTS associated with BPH. The bladder neck and prostate are richly innervated with α-adrenergic receptors, specifically α_{1a}-receptors, which constitute about 70% to 80% of the total number of α-receptors in these areas. α_{1b}-Receptors modulate vascular smooth muscle contraction and are located in the bladder neck and prostate to a lesser degree.

Doxazosin, terazosin, tamsulosin, and extended-release alfuzosin are long-acting α-receptor antagonists. They are typically administered once daily, usually at bedtime to minimize the potential for orthostatic hypotension. These medications act through α_1-receptors and can cause vasodilation resulting in transient hypotension and lightheadedness. Blood pressure reduction is greater in patients with hypertension (average reduction, 10 to 15 mm Hg) relative to normotensive patients (average reduction, 1 to 4 mm Hg). Overall, 10% to 20% of patients experience some (often transient) side effects from these medications, including dizziness, asthenia, headaches, peripheral edema, and nasal congestion. Dose titration is recommended for doxazosin and terazosin to minimize occurrence of these adverse effects and optimize the therapeutic response. Doxazosin and terazosin require at least 4 or 5 mg, respectively, to achieve a therapeutic effect. Maximal response is usually seen within 1 to 2 weeks with doxazosin and within 3 to 6 weeks with terazosin. Overall, these drugs reduce symptom scores by 40% to 50% and improve urinary flow rates by 40% to 50% in about 60% to 65% of patients treated.

Tamsulosin is a selective α_{1a}-receptor antagonist with a long half-life. It has a significantly lower degree of nonspecific α-receptor binding compared with other α-receptor antagonists. Therefore, side effects such as postural hypotension and dizziness are less common. This drug does not appreciably affect blood pressure in hypertensive or normotensive patients. Maximal response is usually seen within 1 to 2 weeks after the initiation of therapy.

5α-Reductase Inhibitors (Finasteride and Dutasteride)

Finasteride and dutasteride block the intracellular conversion of testosterone to DHT by inhibiting the action of the enzyme 5α-reductase. This results in an approximate 18% to 25% reduction in prostate gland size over 6 to 12 months. It is most effective in reducing symptoms and preventing disease progression in patients with large prostate glands (>40 mL [Prostate measurement for clinical purposes is usually described in mL, but 1 mL= 1 g = 1 cc]), although recent evidence suggests that symptomatic improvement and stabilization of disease progression may occur in treated men with prostates as small as 30 mL. 5α-Reductase inhibition has also been shown to decrease the risk for urinary retention and subsequent surgical intervention, again predominantly in those patients with larger glands. Initial response is seen within 6 months, and maximal effect occurs 12 to 18 months after the initiation of therapy.

Finasteride and dutasteride reduce serum PSA by about 50%. This must be taken into consideration when interpreting PSA values in men taking these agents. After 6 months of therapy, the effective PSA level in a patient taking finasteride or dutasteride may be calculated by doubling the measured PSA value. Free PSA (the percentage of non–protein-bound PSA) is also reduced by about 50%. Use of finasteride or dutasteride may result in sexual dysfunction, including decreased erectile rigidity, decreased libido, and decreased ejaculate volume. ED caused by 5α-reductase inhibitor therapy is reversible and returns to baseline within 2 to 6 months after discontinuation of therapy.

Phosphodiesterase Type 5 Inhibitors

Although they are more often thought of as medications for the treatment of ED, sildenafil, vardenafil, and tadalafil have been shown to be efficacious in the treatment of the symptoms of BPH. As previously discussed, these medications work by preventing the degradation of cGMP by PDE5. This results in lower intracellular calcium levels and, consequently, smooth muscle relaxation. This process works in the vasculature of the penis as well as the smooth muscle cells of the prostate, urethra, and bladder neck. A number of randomized, double-blind, placebo-controlled trials have shown improvements in LUTS in men treated with a once-daily regimen of one of these medications. Although it has not been conclusively shown that PDE5 inhibitors are more efficacious than α-blockers, it does appear that the combination of the two medications works better than either one of them alone. The common side effects of these medications are headache, nasal stuffiness, and facial flushing.

Anticholinergic Medications

For most men, symptoms of overactive bladder make up a large component of LUTS associated with BPH. Most men with bladder outlet obstruction have symptoms of urgency, frequency, and nocturia. As in female patients, one of the best ways to treat these symptoms of overactive bladder is with daily use of anticholinergic medications such as oxybutynin, tolterodine, or solifenacin. When these medications are used in combination with an α-blocker, there can be significant improvement in LUTS in men with symptoms of overactive bladder. Except in patients with small prostates (<29 mL), it does not appear that anticholinergic monotherapy is better than combination therapy or α-blocker monotherapy. The typical side effects of this class of medications include dry mouth, constipation, nausea, and impaired cognition. The risk of urinary retention related to the use of these medications in men appears to be minimal.

SURGICAL MANAGEMENT

Minimally Invasive Therapy

Although TURP remains the standard for surgical treatment of BPH, substantial effort has been devoted to the development of less invasive and less morbid methods of treating patients with symptomatic BPH. This has led to a number of minimally invasive therapies, primarily using different methods of generating heat within the prostate gland to cause tissue destruction. These office-based heat techniques transiently increase bladder outlet obstruction for 1 to 2 weeks due to postprocedure swelling. Maximal tissue reduction and treatment effect occur within 12 weeks.