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Original Article

# Tamsulosin – Turn A Round: A Review

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ABSTRACT

Tamsulosin is a sulfamoylphen-ethylamine derivative, a potent and a selective antagonist of Alpha-1A adrenoceptor. It's approved in the treatment of LUTS in BPH disease, being a specific Alpha -1A blocker it does not interfere much with the cardiovascular system. Though an age old molecule but still it's a friendly drug to most of the physicians. Even the recent studies found its as efficacious to some of the newer molecules in the group.



## 1. Introduction

Tamsulosin is a sulfamoylphen-ethylamine derivative(Fig 1). It is a more potent and selective antagonist of Alpha-1A adrenoceptor. Tamsulosin is a steroisomer. The binding of R (-) isomer is greater than that of S (+) isomer. The R (-) isomer is a modified release formulation is commercially available.

## 2. Pharmacodynamic Properties

Tamsulosin is a highly selective alpha1-adrenergic antagonist that was developed to avoid the side effects of nonselective agents.In the new nomenclature agreed upon by the International Union of Pharmacology the cloned Alpha-1 adrenoreceptor subtypes are Alpha-1A, Alpha-1B and Alpha-1D.1 The messenger RNA expression of Alpha-1A,Alpha-1D subtypes are predominant in the prostate and the base and neck of the urinary bladder 2,3.

The Alpha-1 adrenoreceptor subtypes selectively of tamsulosin was demonstrated to be Alpha-1A>Alpha-1D=Alpha-1B in exvivo radioceptor assays in placebo controlled, single blind, randomized, cross over study.

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## 3.Urodynamic

The efficacy of tamsulosin is by the blockade of Alpha-1A adrenoceptor in the prostate, there by relaxes the smooth muscles and results in the improvement of urinary flow rate4, 5, 6. It also contributes to the blockade of Alpha-1A, lpha-1D adrenoceptor in the bladder which inhibits the detrusor muscle instability and storage symptoms.7, 8,9 and may involve blockade of Alpha adrenoreceptors in the sympathetic nervous system and spinal cord.

## 4.Cardivascular System

Unlike other Alpha blockers which are developed for treating hypertension, tamsulosin was specifically developed for the treatment of LUTS in BPH.10 Significantly less symptomatic orthostatic hypotension was documented with tamsulosin[11].

## 5.Pharmacokinetics

Absorption of tamsulosin is gradual with a bio-availability of 100 percent under fasting conditions.12 Fasting conditions increases the area under the tamsulosin plasma concentration-time curve by 30 percent and the mean maximum plasma concentration (cmax) by 40-70 percent compared with fed condition.

Tamsulosin 0.4 mg when administerd with food, the maximum concentration (tmax) increases to 6 hours in contrast of 4 hours in Fasting conditions.

Tamsulosin is metabolized in the liver by CYP 450 enzyme[13], 14.The primary iso-enzyme involved are CYP3A4 and CYP2D6.The metabolites do not play a major role in the efficacy of the drug. The clearance of tamsulosin is relatively slow (2.88L/hr)[13].Increased age diminishes the intrinsic clearance of tamsulosin, which results in slightly prolonged disposition of the drug in the elderly patient.[13]

After a single dose administration of the modified release tamsulosin 0.2 mg in healthy volunteers the elimination half life was 9 hours[15].The modified release tamsulosin 0.4 mg is estimated to be 14-15 hours in the elderly patients and 9 – 13 hours in healthy volunters[13].

### 6.Therapeutic Efficacy

Tamsulosin improved the symptom score to a greater extent and also increased Q max when used especially in patients with mild to severe LUTS. The reduction in IPSS score from base line in all groups of patients with LUTS. In a recent study (2010) by Kawachi et al found that tamsulosin reduced the LUTS in patients suffering from BPH.15.

### 7.Tolerability

Tamsulosin is well tolerated in the long term studies in the patients with LUTS regarding the age. The most common adverse effect occurred is abnormal ejaculation, the others are headache, dizziness, asthenia, rhinitis and orthostatic hypotension.[15]

### 8.Dosage And Administration

Tamsulosin is indicated for the treatment of BPH.[13,14,16] The usual dose is 0.4 mg/day once daily after the breakfast and the dose may be increased to 0.8 mg once daily for the patients who fail to respond the 0.4mg dose after 2-4 weeks of treatment. The capsule should not be crushed as this will interfere with the modified release of tamsulosin [8,13] It should be taken after the same meal each day to produce consistent plasma drug concentration.

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