



Analytical Methods for the Estimation of Tamsulosin - A Review

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Abstract

Tamsulosin (Figure 1) is chemically 5-[(2R)-2-[2-(2-ethoxy phenoxy)ethyl amino] propyl]-2-methoxy benzene sulfonamide ($C_{20}H_{28}N_2O_5S$) with molecular weight 408.5117 gm/mole. Tamsulosin (CAS: 106133-20-4) acts by blocking alpha-1A and alpha-1D adrenoceptors (1-2). Tamsulosin can be used alone or in combination with other medicines. It is available with different brand names

Keywords: Tamsulosin; Spectrophotometry; HPLC; HPTLC; LC-MS/MS

Introduction

Tamsulosin (Figure 1) is chemically 5-[(2R)-2-[2-(2-ethoxy phenoxy)ethyl amino] propyl]-2-methoxy benzene sulfonamide ($C_{20}H_{28}N_2O_5S$) with molecular weight 408.5117 gm/mole. Tamsulosin (CAS :106133-20-4) acts by blocking alpha-1A and alpha-1D adrenoceptors [1,2]. Tamsulosin can be used alone or in combination with other medicines. It is available with different brand names such as Tamsulen, Tamsulix, Tasmulin etc with label claim 0.4 mg as tablets and capsules.

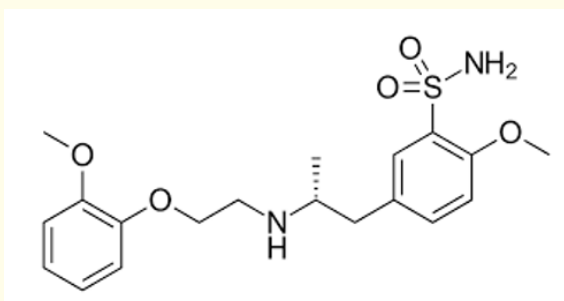


Figure 1: Chemical structure of Tamsulosin.

Tamsulosin was estimated by different analytical techniques such as spectrophotometry [3-10], LC-MS/MS [11,12], HPTLC [13,14] and HPLC [15-23], in pharmaceutical formulations as well as biological fluids. Table 1 represents the details of spectrophotometric methods and Table 2 represents the details of liquid chromatographic methods (LC-MS/MS, HPTLC and HPLC).

Table 1: Spectrophotometric Methods.

Reagent	Linearity ($\mu\text{g/ml}$)	λ_{max} (nm)	Reference
Bromophenol blue	7.5-22.5	421	3
Sodium hydroxide, Perchloric acid 70% and Methanol	5 -25	224	4
Methanol: water (2:8)	10-90	280	5
Methanol and water (30:70%)	5-35	220-227.60	6
Bromocresol green	1-160	415	7
Acetonitrile	10-65	235	8
Folin reagent	(16-48)	440	9
Sodium nitroprusside	(8.0-24)	560	
Bromothymol blue Bromophenol blue Bromocresol purple Bromocresol green	2.5-25	415	10

Table 2: Liquid Chromatographic Methods.

Method	Mobile phase (v/v)	Linearity ($\mu\text{g/ml}$)	Reference
LC- MS/MS (Human plasma)	Acetonitrile: Water: Formic acid (80:20:50)	1-25	11
LC- MS/MS	Acetonitrile: 0.01M Ammonium formate (90:10)	0.0002-0.1	12
HPTLC	Toluene: Methanol: Triethylamine (3.5: 1.2: 0.2)	0.4-2.4 per spot	13
HPTLC	Ethyl acetate: Methanol: Ammonia (6: 4: 0.05)	0.1–0.7 per band	14
HPLC	Acetonitrile: Water (50:50)	5-100	15
HPLC	Acetonitrile: Buffer (30:70)	75-150	16
HPLC	Sodium perchlorate buffer: Acetonitrile (35:65)	0.005–25	17
HPLC	Phosphate buffer: Acetonitrile (60:40)	80-120	18
HPLC	Phosphate buffer: Acetonitrile (55:45)	10-200	19
HPLC	Methanol: Water (70:30)	2-30	20
HPLC	Acetonitrile: Phosphate buffer (45:55)	10-50	21
HPLC	Methanol: Phosphate buffer (80:20)	5-250	22
HPLC	Water: Acetonitrile (90:10)	0.2 -1.9	23

Conclusion

The present review represents the various analytical techniques developed for the estimation of Tamsulosin used for the treatment of prostate in men.

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