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Review Article

A Review on Analytical Techniques for the Assay of Loratadine

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Abstract

Loratadine belongs to second generation antihistamines category. It is a drug used to treat allergies. A brief review of the analytical techniques such as spectrophotometry, liquid chromatography, mass spectrometry so far developed for the estimation of Loratadine were summarized in the present study.

Keywords: Loratadine

Introduction

Loratadine (CAS: 79794-75-5) (Figure 1) is used to treat high blood cholesterol [1,2]. Loratadine is chemically ethyl 4-(8-chloro-5,6-dihydro-11H-benzo [5,6] cyclohepta [1,2-b] pyridin-11-ylidene)-1-piperidinecarboxylate with molecular weight 382.88 grams/mole. It is not soluble in water, but very soluble in acetone, alcohol, and chloroform. Loratadine ($C_{22}H_{23}ClN_2O_2$) is used for the symptomatic treatment of allergic conditions such as hay fever (allergic rhinitis), urticaria (hives), chronic idiopathic urticaria and other skin allergies [1-4]. Loratadine works by specifically targeting the H_1 histamine receptors to provide its desired effect. Loratadine is available with brand names, Loratec-10, Lorfast Meltab, Lorapil-10 etc.

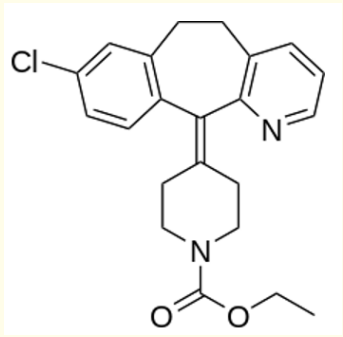

Figure 1: Chemical structure of Loratadine.

Loratadine was estimated by different spectrophotometric methods using various reagents. Noor Jahan., *et al.* developed a spectrophotometric method [5] using 0.1N Methanolic HCl for the estimation of Loratadine (λ_{max} 275 nm) and Beer-Lambert's law was obeyed over the concentration range 2-10 µg/ml. Georgeta., *et al.* developed a spectrophotometric method [6] using potassium tetra iodo mercurate in 0.05M HCl medium for the estimation of Loratadine (λ_{max} 362 nm) and Beer-Lambert's law was obeyed over the concentration range 10-100 µg/ml. Prathap., *et al.* developed a spectrophotometric method [7] using 0.1N HCl and ethanol for the estimation of Loratadine (λ_{max} 276 nm) and Beer-Lambert's law was obeyed over the concentration range 0.5-2.5 µg/ml. The details of these spectrophotometric methods were shown in Table 1.

Different authors have developed various liquid chromatographic methods [8-16] using different mobile phases, column, flow rates and some of the parameters were summarized in Table 2.

Table 1: Spectrophotometric methods.

Reagent	Linearity (µg/ml)	λ_{max} (nm)	Reference
0.1N Methanolic HCl	2-10	275	5
0.05M HCl	10- 100	362	6
0.1N HCl Ethanol	0.5-2.5	276	7

Some liquid chromatography-mass spectrometric methods [17-23] have also been developed for the estimation of Loratadine and a brief summary of these analytical methods were discussed in Table 3.

Mobile phase (v/v)		Column	Linearity	Ref
Phosphate buffer (pH 2.9): Acetonitrile	280	XDB-C8	0.12-0.60	[8]
Water: Acetonitrile: 0.5 M KH_2PO_4: Conc. H_3PO_4 (48:44:8:0.1)	220	C18	0.001-0.4 (Water) 0.0013-0.4 (Plasma)	[9]
Acetonitrile: Water: 0.5 M Phosphate buffer (44:48:8)	200	Supelcosil LC-18-DB	0.0005-0.05	[10]
Acetonitrile: Methanol: Phosphate buffer solution (0.*01*M, pH 7.2 ± 0.1) (35:45:20)	245	C18 ODS	4.0-24	[11]
Acetonitrile: ortho phosphoric acid (35:65) (Internal standard: Benzophenone)	250	C18	5-50	[12]
Methanol: TEA (95:5) (pH adjusted with ortho phosphoric acid)	242	Chromosil C18	5-30	[13]
Acetate buffer: Methanol (15:85)	248	C18 Eclipse XDB	0.1-50	[14]
0.1% Perchloric acid: Acetonitrile (55:45)	280	Kromosil C18	5-1022	[15]
0.05 M Phosphate buffer: Acetonitrile: Methanol: TEA (38:45:17:0.5) (pH 3.6 adjusted with ortho phosphoric acid)	220	Inertsil ODS-3V	1.2	[16]

Table 2: Liquid chromatographic methods.

Mobile phase (v/v)	Linearity (n)	Reference
Acetonitrile: Water: TFA (90:10:0.1)	1.0	[17]
Methanol: Water: 1M Ammonium trifluoro acetate (70:30:0.1)	0.05-15	[18]
0.4% Formic acid: Acetonitrile (20:80)	0.5-100	[19]
0.1% Formic acid: Acetonitrile	0.2-20	[20]
0.5% Formic acid: Acetonitrile (10:90)	0.05-10	21
Acetonitrile: 0.2% Formic acid	0.10-10	22
Acetonitrile with 0.2% Formic acid: 0.2% Formic acid in water (45:55)	0.04-400	23

Table 3: Mass spectrometric methods.

Conclusion

The present study represents a detailed review of the analytical methods so far developed for the estimation of Loratadine in pharmaceutical dosage forms as well as human plasma.

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