A REVIEW ON CHROMATOGRAPHIC AND SPECTROPHOTOMETRIC METHOD FOR ESTIMATION OF OPIPRAMOL DIHYDROCHLORIDE IN PHARMACEUTICAL DOSAGE FORM

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ABSTRACT

Opipramol dihydrochloride is an Antidepressant and Anxiolytic drug. It is a member of the tricyclic antidepressants, opipramol's primary mechanism of action is much different in comparison. Most TCAs act as reuptake inhibitors, but opipramol dihydrochloride does not, and instead acts as a sigma receptor agonist. This is generally administered as tablet dosage form. Mostly the work is done on RP-HPLC with different methods and for its estimation the mobile phase used are usually the same that are in different ratio of Acetonitrile and Potassium Dihydrogen Orthophosphate. This review entails the different methods for estimation of Opipramol dihydrochloride like UV, HPTLC, HPLC, LC.

KEYWORDS: Opipramol dihydrochloride, Antidepressant, stability indicating method, UV-spectroscopy, HPLC (High Performance Liquid Chromatography), HPTLC (High Performance Thin Layer Chromatography), LC (Liquid Chromatography).

INTRODUCTION

Opipramol dihydrochloride has reported to be a rather potent sigma ligand with high affinity to sigma1 and lower affinity to sigma 2 sites with pronounced D2-,5-HT2- and H1-blocking potential. So opipramol is an atypical anxiolytic and anti-depressive drug. It is a psychotrophic drug commonly used for therapy of somatoform, general anxiety disorder, anxious depressive
The biphasic action initially makes prompt improvement of tension, anxiety and insomnia.

Chromatographic methods can be categorized in two ways. The first classification is based upon the physical means by which the stationary and mobile phases are brought into contact. In column chromatography, the stationary phase is held in a narrow tube through which the mobile phase is forced under pressure. In planar chromatography, the stationary phase is supported on a flat plate or in the interstices of a paper; here, the mobile phase moves through the stationary phase by capillary action or under the influence of gravity.

Spectrophotometry is a method to measure how much a chemical substance absorbs light by measuring the intensity of light as a beam of light passes through sample solution. The basic principle is that each compound absorbs or transmits light over a certain range of wavelength. This measurement can also be used to measure the amount of a known chemical substance. Spectrophotometry is one of the most useful methods of quantitative analysis in various fields.

- **UV-visible spectrophotometer**: uses light over the ultraviolet range (185 - 400 nm) and visible range (400 - 700 nm) of electromagnetic radiation spectrum.
- **IR spectrophotometer**: uses light over the infrared range (700 - 15000 nm) of electromagnetic radiation spectrum.

It was revealed that the UV and HPLC method are done for the estimation of opipramol dihydrochloride. And also the stability indicating HPTLC of opipramol HCl is done. But there is no method available for stability indicating RP-HPLC method for opipramol dihydrochloride hence there is need to study and develop stability indicating RP-HPLC method for opipramol dihydrochloride.

**Reported methods are categorized depending on the following considerations**

Opipramol dihydrochloride was analysed by different methods like UV-spectroscopy, HPLC, HPTLC, LC.
## Methods for estimation of Opipramol dihydrochloride

<table>
<thead>
<tr>
<th>SR. NO.</th>
<th>DOSAGE FORM</th>
<th>METHOD</th>
<th>DESCRIPTION</th>
</tr>
</thead>
</table>
| 1.      | Opipramol in bulk and tablet dosage form. | UV Zero order derivative spectrophotometric. | Detection wavelength: 254 nm  
Concentration range: 2-10 µg/ml  
R²: 0.996  
LOD: 0.2181 µg/ml  
LOQ: 0.7272 µg/ml |
|         |             | UV First order derivative spectrophotometric. | Detection wavelength: 266 nm  
Concentration range: 2-10 µg/ml  
R²: 0.998  
LOD: 0.1363 µg/ml  
LOQ: 0.4545 µg/ml |
| 2.      | Opipramol in plasma and urine. | HPLC | Column: guard column  
Mobile phase: Acetonitrile  
Dipotassium hydrogen Orthophosphate (20:80)  
Flow rate: 1.2 ml/min  
Temperature: 30°C |
|         |             | TLC | Stationary phase: silica rapid F 254, ICN  
Mobile phase: Ethylacetate : Methanol : Ammonium hydroxide 25% (50:450:1)  
Spot detection: 254 nm |
|         |             | GC-MS | GC column: Hewlett-Packard Model 5890 B with an SE-54 fused-quartz silica capillary column.  
Column temperature: 70-300°C at 20°C/min.  
Carrier gas: Helium  
Flow rate: 1.5 ml/min  
MS model: TSQ 700 MS |
| 3.      | Opipramol in plasma | Quantitative determination by HPLC + UV | Column: Zorbax Eclipse XDB-C18 Column and ACE 5 CN guard column.  
Concentration range: 2-70 ng/ml  
Detection wavelength: 256 nm  
R²: 0.998.  
Retention time: 8.36 min. |
|         | Opipramol in pharmaceutical dosage form. | RP-HPLC | Column: C18 column  
Mobile phase: Dipotassium hydrogen Orthophosphate: Acetonitrile  
Detection wavelength: 257 nm  
Concentration range: 5-60 µg/ml  
Flow rate: 1 ml/min  
Retention time: 4.43 min.  
Regression equation:  
Y=273255.34x+101066311  
LOD: 0.05  
LOQ: 0.15  
% Assay: 98.96% |
| 4.      | Opipramol in tablet dosage form. | RP-UFLC | Column: Phenomenex Luna C8 column.  
Mobile phase: Potassium Dihydrogen Phosphate: Acetonitrile (60:40 v/v) |
<table>
<thead>
<tr>
<th>Flow rate</th>
<th>Detection wavelength</th>
<th>Concentration range</th>
<th>Retention time</th>
<th>LOD</th>
<th>LOQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>1ml/min</td>
<td>253nm</td>
<td>200-1000ng/ml</td>
<td>2.72 min</td>
<td>11.95ng/ml</td>
<td>36.21ng/ml</td>
</tr>
<tr>
<td>Column</td>
<td>Mobile phase</td>
<td>Flow rate</td>
<td>Detection wavelength</td>
<td>Concentration range</td>
<td>Retention time</td>
</tr>
<tr>
<td>Inertsil column</td>
<td>Acetonitrile : Ammonium acetate (65:35% v/v)</td>
<td>1.2 ml/min</td>
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<td>10-35 µg/ml</td>
<td>5.572 min</td>
</tr>
<tr>
<td>Column</td>
<td>Mobile phase</td>
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<tr>
<td>Electroanalytical determination.</td>
<td>Mobile phase</td>
<td>Flow rate</td>
<td>Detection wavelength</td>
<td>Concentration range</td>
<td>Retention time</td>
</tr>
<tr>
<td>glassy carbon electrode</td>
<td>3.7 Acetate buffer.</td>
<td>0.86 V</td>
<td>2<em>10^{-6} to 6</em>10^{-5} M</td>
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</table>

**CONCLUSION**

This review portrays the reported Spectroscopic and Chromatographic methods developed and validated for estimation of Opipramol dihydrochloride. According to this review, it was concluded that for Opipramol dihydrochloride, different Spectroscopic and Chromatographic methods are available for single. All methods are found to be simple, accurate, economic, precise, and reproducible in nature. As per review, most of works have used the reversed-phase HPLC and UV absorbance detection because this provided with best available reliability, repeatability, analysis time and sensitivity.

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REFERENCES


