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ORIGINAL RESEARCH ARTICLE

Visible Spectrophotometric Estimation of Tenoxicam from Tablets

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ABSTRACT

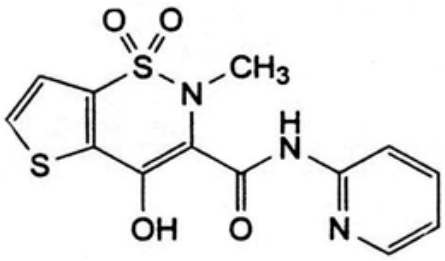
A simple, Precise, accurate, fast and economical methods have been developed for the quantitative estimation of Tenoxicam from tablet formulation using Bromophenol blue. Tenoxicam forms a Blue colored chromogen with the reagent, which shows absorbance maxima at 421.5 nm and linearity in the concentration range of 5-25 µg/ml of drug. The results of analysis for the methods were validated statistically and by recovery studies.

Key words: Erichrom black T, Tenoxicam.

INTRODUCTION

Tenoxicam chemically 4-hydroxy-2-methyl-n-(pyridinyl-2-yl)-2h-thieno [2, 3-e]-1, 2-thiazine-3-carboxamide 1, 1-dioxide, is a Non steroidal anti inflamattery drug [1]. It is used to relieve inflammation, swelling, stiffness, and pain associated with rheumatoid arthritis, osteoarthritis, ankylosing spondylitis .It is official in BP [2].

Fig 1: Structure of Tenoxicam



Literature survey reveals LC-MS [3], HPLC [4-10], spectrophotometer [10-15] methods for the estimation of Tenoxicam from pharmaceutical formulation. A Shimdzu double beam UV/Vis spectrophotometer model 1700 with 1 cm matched quartz cells was used for absorbance measurement.

EXPERIMENTAL

Preparation of reagent and solution

Bromophenol blue solution (0.2% w/v) was prepared in 0.1N HCl and was extracted several times with chloroform so as to remove chloroform soluble impurities.

Preparation of standard solution

Accurately weighed drug (10 mg) was transferred in 100 ml volumetric flask, dissolved in 50 ml of methanol and diluted with same. The final solution contained 100 µg / ml of the drug.

Procedure for calibration curve

Standard solutions of tenoxicam (0.5, 1, 1.5, 2, 2.5 ml) were pipetted out in to a series of 10 ml volumetric flask. The volume was adjusted with methanol. So as to give several dilutions in concentration range 5-25 µg/ml of drug. To 10 ml of each dilution taken in separating funnel, 5 ml of bromophnol blue solution was added. Reaction mixture was shaken gently, then 5 ml chloroform added shaken for 5 min and allowed to stand so as to separate chloroform layer. The chloroform layer was separated out and transferred to another volumetric flask and reaction mixture was extracted with successive 3ml, 2ml, of chloroform. The seprated layer combined with previous chloroform extrcted layer. Absorbance of this final cholroform solution was measured at 412.5 nm against reagent blank. Calibration curve was plotted between concentration of drug and measured absorbance.

Procedure of analysis for tablet formulations

Twenty tablets of tenoxicam were weighed accurately and average weight per tablet determined. The tablets were finely powdered and powder equivalent to 10 mg of tenoxicam was taken in a 100 ml volumetric flask containing 40 ml methanol, sonicated for 20 minutes. The resultant was filtered through whatman filter paper No.41 into another 100 ml volumetric flask.

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The filter paper was washed several times with methanol. The washings were added to the filtrate and the final volume was made up to the mark with methanol. Two milliliters filtrate of the sample solution was diluted to 10 ml with methanol and respective final dilution was taken in separating funnel and treated as per the procedure of the calibration curve. Measured absorbance at 412.5 nm and determined concentration of drug present in sample from calibration curve.

The procedure of analysis was repeated five times with two different tablet formulations. Results of analysis are reported in (**Table 1**)

Fig 2: UV spectra of tenoxicam with brmophenol blue reagent

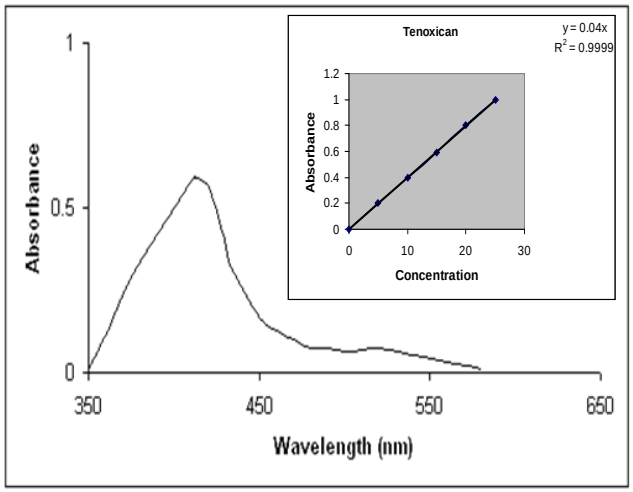

Table 12: Result of analysis of commercial formulation

Brand name (Tab.)	Labeled amount (mg/tab.)	Label claim estimated*		Standard Deviation	Relative Standard Deviation	Coefficient of variance
		mg	%			
Tobitil	20	19.75	99.66	0.3950	0.0039	0.3997
Novdil	20	19.84	98.83	0.8020	0.0080	0.8071

** Each value is an average of five estimations*

Recovery Studies

Recovery studies were carried out for the method by addition of known amount of standard drug solution of tenoxicam to pre-analyzed tablet sample solution at three different concentration levels. The resulting solutions were analyzed by proposed method. The result of recovery studies were found to be satisfactory and are reported in (**Table 2**).

Table 2: Results of recovery studies

Brand name	Labeled amount (mg/tab.)	Amount added to final dilution (µg/ml)	Amount recovered (µg/ml)	Percentage recovery
Tobitil	20	5	4.92	98.50
		10	9.92	99.25
		15	14.8	98.66
Novotil	20	5	4.93	98.60
		10	9.93	99.30
		15	15.03	100.2

RESULTS AND DISCUSSION

In present research work one colorimetric method has been developed for determination of tenoxicam from its tablet formulations. The developed colorimetric methods are based on formation of colored complex of drug with coloring reagents. Developed method is based on reaction of drug with brmophenol blue reagent. The formed complex was found to be most stable when drug solution was prepared in methanol. Percentage label claim of tablet formulation using this method was found to be in the range of 98.83-99.66-% and standard deviation was in the range of 0.395- 0.802 for two different batches of tablet formulation of tenoxicam. Recovery studies were carried out by the addition of known amount of standard drug solution of tenoxicam to pre-analyzed tablet sample solution at three different concentration level for developed methods and results of recovery studies were found to be satisfactory. The developed colorimetric methods can be used with any model of spectrophotometer or colorimeter and does not require sophisticated recording spectrophotometer these methods were found to be simple, accurate and economical.

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