ORIGINAL ARTICLE

ScienZTech

INTERNATIONAL JOURNAL OF NOVEL TRENDS IN PHARMACEUTICAL SCIENCES

Published by ScienzTech Publication Journal Home Page: www.scienztech.org/ijntps

Simultaneous estimation of simvastatin and piperine in its formulation by UV spectrophotometric method

Vijayamma G*, Panneerselvam P, Siddeswari T, Nithya Kalyani K, Jeslin, Suryasree Y

Department of Pharmaceutical Analysis, Faculty of Pharmacy, Sree Balaji Medical College Hospital Campus, Bharath Institute of Higher Education and Research, Chrompet, Chennai-600044, Tamilnadu, India

Article History:

Received on: 11 Dec 2020
Revised on: 28 Dec 2020
Accepted on: 23 Jan 2021
Published on: 19 Feb 2021

Keywords:

simvastatin,
Piperine,
estimation,
formulation

ABSTRACT

The active ingredient, called piperine, is present in black pepper. The ions are very small so they are easily consumed by the tissue and nervous system, causing the chemical release within the brain. Piperine has been shown to help ease gastrointestinal ailments, help with vomiting, and has the ability to help with inflammation of the body. This explains to us how simvastatin can help expedite piperine in the body. The new, clear, effective, quick, accurate ultraviolet spectrophotometric method has to be validated and developed for the study of simvastatin and piperine in bulk and poly-herbal formulations. Data from validation experiments was tested using methodological techniques. Since processing at a wavelength of 285nm, the standard solution appeared to have a far higher absorbance than at other wavelengths. Normal simvastatin and piperine have been measured in varying amounts, and they make spectrums of overlays. In Beer Law, the concentration (C) of a solvent is plotted against the absorbance (A) from a calibration curve, as a result. A linearity range of between 14and 39μg/mL was observed. The sample was tested by prorating the standard deviation and standard error of the approximate means with the sample size, demonstrating the accuracy and the precision of the methods used in the analysis. Based on the experimental findings, it can be easily inferred that for UV spectrometry estimation of simvastatin and piperine from pharmaceutical intravenous liquid formulation, the proposed method is very simple, fast, accurate, precise, economical and reproducible.

*Corresponding Author

Name: Vijayamma G
Phone: 8886464214
Email: vijaya41.gp@gmail.com

eISSN: 2277-2782

DOI: https://doi.org/10.26452/ijntps.v11i1.1396

Production and Hosted by

ScienzTech.org

INTRODUCTION

Although even less prevalent in medicinal herb usage, piperine can induce a burning sensation because the alkaloid in black pepper gets into your bloodstream when you take the supplement. Piperine is a meal that helps the body of ill affects in a number of ways [1]. One of those effects is in reference to fatigue, headaches and impaired digestion. This explains to us how simvastatin can help expedite piperine in the body. In this analysis, it was seen that bioavailability of simvastatin was improved (much more efficient) with only 1/20 teaspoon of black pepper, and the benefits were furthered with that volume. There are no tools that can decide whether the drug is contained in a biological fluid or medicinal formulations, mainly by HPTLC [2, 3], HPLC [4–6], spectrophotometery. For the best research in the world, the fresh, simply effective, fast, precise, and simple ultraviolet spectrophotometric method would have to be validated and optimized for the study of simvastatin and

piperine within bulk and poly-herbal formulations. Data from validation experiments was tested using methodological techniques.

MATERIALS AND METHODS

UV-Vis 1700 spectrophotometer, Make: Shimadzu, Kyoto, Japan, Scan speed: 40nm/min, Bath Sonicator. All the reagents used in this assay were of analytical quality. Simvastatin and piperine poly herbal gels have been purchased.

Experimental

The weighed amount of what was routine was dissolved in a mixture of NaOH to reach a concentration of 100μg/ml. Look at a thin analyte-containing solution to see if it absorbs light. Investigate the dilution effect on overall absorption by diluting the stock solutions into a total of 200-400 microliters (millionth) and scanning 200-400 nanometers. A stock solution of 10 mg of simvastatin and 10 mg of piperine was made by dissolving 10 mg of rutin in 100 ml of 0.1 N NaOH to get a final solution of 100 μg/ml. A UV/VIS spectrophotometer Model 1700 was used to prepare the calibration curve in 0.1N NaOH at namemax 276nm. A 100 μg/ml solution of this substance has now been packed. In a sequence of absorbance readings of 10, 15, 20, and 25μg/ml, and one reading of 30μg/ml, the highest absorbance was found to be 276nm. A sample of 6 measurements of value taken on a 90-degree spectrum for any of the 6 data sets and for any data set, the spectral bins were measured at ranges ranging from 200 to 400 nanometers to make the samples fell linearly on a linear calibrations curve. 500 mg of lotion containing 5 mg of simvastatin and 1000 mg of piperine was weighed. The icing is equivalent to 100 mg simvastatin and the piperine was equally dissolved with 0.1N NaOH with the mixture eventually transferred to 100ml volumetric flask. The fluid was then passed through Whatman filter paper No 40 (0.45 micron), leaving a minimal amount of fluid retained on the paper. The amount of fluid that remained was aliquoted out and diluted to 10 ml of 0.1 N NaOH in order to reach a 20 μg/μl absorbance value of 276 nm against 0.1 N NaOH as a null.

Since using appropriate performance criteria, the limit of detection (LOD) and limit of quantitation (LOQ) were determined using the standard response deviation and slope process [7], as defined in the guidelines of the International Conference on Harmonization (ICH) [8]. The findings found in the tables in Table 1 were found to be as shown [Table 1].

The detection limit, (λ) and the quantification limit (λ) were calculated using the equation above. If the LOD is 3.3Δ/s and the LOQ is 10Δ/s, then the standard deviation for a blank coefficient is 5.007Δ/s and the slope is s=$-$3.432Δ/s.

So, to make sure that the outcomes of the procedure were correct, recovery assessments were conducted. In order to assess the effectiveness of this method, we added a known amount of pure cocaine to the pre-analyzed mixture and followed the protocol to be used. The percentage recovery was estimated from the volume of medicine found in the plasma. The findings of the study of the recovery test were conducted with a standard drug to the sample at three different levels of concentration [9].

RESULTS AND DISCUSSION

Since processing at a wavelength of 285nm, the standard solution appeared to have a far higher absorbance than at other wavelengths. Normal simvastatin and piperine have been measured in varying amounts, and they make spectrums of overlays. In Beer Law, the concentration (C) of a solvent is plotted against the absorbance (A) from a calibration curve, as a result. A linearity range of between 14and 39μg/mL was observed. It was shown that, for the plotted lines, the equation Y= 0.0672X - 0.0698 is a straight line with a correlation coefficient of 0.995 moving through the origin. The correlation with the population was quite significant. Thus, based on the optical properties and other parameters that I have specified, this item can be validated. The test used in the ad withdrawal assay was reviewed by the values of standard deviation and standard error of the process. The results were shown as follows. Regarding the use of the check list in table 3, it is further verified by the excellent post-test. Using a new procedure three times in a row, the assay sample gave results of 104.98 percent for the labeled articles and 102.72 percent for the mentioned articles[Tables 2 and 3].

CONCLUSION

It could be concluded that, for infrared spectrophotometric estimation of simvastatin and piperine from pharmaceutical formulation, the proposed method is fast, rapid, accurate, effective, precise, economical, and reproducible. The recent advancement that is going to help us to introduce simvastatin and piperine to the bulk and prescription dosage forms can be successfully added to this process.

Table 1: Precision and accuracy results of simvastatin and piperine

S. no.	Parameters	Simvastatin	Piperine
1	max(nm)	279	281
2	linearity range	17-42μg/ml	18-43μg/ml
3	regression equation	Y=0.0742X-0.0765	Y=0.0831X-0.0894
4	correlation coefficient	0.998	0.999
5	slope	0.0741	0.0873
6	intercept	0.0632	0.0798
7	Limit of detection(μg/ml)	0.9356	0.9927
8	Limit of quantification(μg/ml)	5.2895	6.4172

Table 2: precision data for simvastatin and piperine

Drug	Conc. ug/ml	intraday	cv	Interday	cv
Simvastatin	15	0.9107±0.0521	2.3858	0.9782±0.0673	5.642
Rutin	15	0.9124±0.0165	4.6181	0.9856±0.0290	6.337

Table 3: Recovery and assay analysis

Detail	Simvastatin	Piperine
Amount used	50mcg	5mcg
Amount recovered	49.86mcg	4.99mcg
Percentage recovered	98.79%	99.84%
Label Claim	500mg	50mg
Estimated	499.68mg	49.82mg
Percentage	99.12%	99.98%

ACKNOWLEDGEMENTS

The authors are thankful to all who have extended their constant support for the completion of the work.

Funding Support

The authors declare that they have no funding support for this study.

Conflict of Interest

The authors declare that they have no conflict of interest for this study.

REFERENCES

[1] Goodman G. The pharmacological basis of therapeutics. 2006;p. 1635–1638.

[2] Dhabale SC. Simple, accurate, precise, reproducible and economical procedures for simultaneous estimation of Glipizide and Metformin hydrochloride in tablet dosage form. International Journal of ChemTech Research. 2009;2:813–817.

[3] Modi DK, Patel BH. SIMULTANEOUS DETERMINATION OF METFORMIN HYDROCHLORIDE AND GLIPIZIDE IN TABLET FORMULATION BY HPTLC. Journal of Liquid Chromatography & Related Technologies. 2012;35:28–39. Available from: 10.1080/10826076.2011.593227.

[4] Venkatesh P, Harisudhan T, Choudhury H, Mullangi R, Srinivas NR. Simultaneous estimation of six anti-diabetic drugs—glibenclamide, gliclazide, glipizide, pioglitazone, repaglinide and rosiglitazone: development of a novel HPLC method for use in the analysis of pharmaceutical formulations and its application to human plasma assay. Biomedical Chromatography. 2006;20(10):1043–1048. Available from: 10.1002/bmc.635.

[5] Yu H, Nola, Ho NM, Emmie, Tang P, Francis WSM, et al. To develop the simple, stability-indicating reversed-phase high-performance liquid chromatographic (RP-HPLC) method for determination of Glipizide in guinea pig plasma. Journal of Chromatography A. 2008;1(2):426–434.

[6] Dhawan S, Singla. High Performance liquid chromatographic analysis of glipizide: application to in vitro and in vivo studies. J Chromatogr Sci. 2003;41(6).

[7] Swaroop R, Lahoti PK, Puranik AA, Heda, Rajesh B. Navale: Development and Validation of RP-HPLC Method for Analysis of Glipizide in Guinea Pig Plasma and its Application to Pharmacokinetic Study. International Journal of Pharm Tech Research. 2010;2(3):1649–1654.

[8] Aburuza S, B, Millershipb J, Mcelnayb J. The development and validation of liquid chromatography method for the simultaneous determination of metformin and glipizide, gliclazide, glibenclamide or glimepiride in plasma. J of Chromatography B. 2005;817(2):277–286.

[9] Rao BU, Nikalje AP. Determination of Glipizide, Glibenlamide and Glimeperide in a Tablet Dosage Form in the Presence of Metformin Hydrochloride by Ion Pair –Reversed Phase Liquid Chromatographic Technique. Journal of Analytical & Bioanalytical Techniques. 2010;01(02):105–105. Available from: 10.4172/2155-9872.1000105.

Cite this article: G Vijayamma, P Panneerselvam, T Siddeswari, Kalyani K Nithya, Jeslin, Y Suryasree. **Simultaneous estimation of simvastatin and piperine in its formulation by UV spectrophotometric method** . Int. J Nov. Tren. Pharm. Sci. 2021; 11(1): 1-4.