Method Development and Validation of Famotidine Oral Suspension by RP-HPLC Method

Prakash chand T, Elancheziyan K, Yamini R, Aysha Jadeera K A, Vijey Aanandhi M, Binoy Varghese Cheriyan*

Department of Pharmaceutical Chemistry and Analysis, School of pharmaceutical Sciences, Vels Institute of Science, Technology and Advanced Studies (VISTAS) Pallavaram, Chennai-600117, Tamil Nadu, India

Article History:
Received on: 05 Jun 2020
Revised on: 13 Jul 2020
Accepted on: 22 Jul 2020

Abstract
For perseverance of Famotidine a simple, fast and selective procedure were developed in drug substance and its pharmaceutical preparations. In the proposed project, a successful attempt has been made to develop a simple, accurate, economic and rapid method for the estimation and to validate the method. As a result, a simple, economical, precise and accurate method was developed and validated by Reverse Phase High Performance Liquid Chromatography (RP-HPLC). The main objective for that is to improve the conditions and parameters, which should be followed in the development and validation. The developed Reverse phase HPLC technique was done utilizing filtered and degassed pH-6.0 Acetate buffer as a Mobile phase-A and pH-6.0 Acetate buffer and organic mixture in the ratio of 30:70 as a Mobile phase-B. By using waters X-Bridge C18 (150*4.6mm), 3.5μm column chromatographic separation was achieved. The flow rate and run time was 0.8mL/min and 45 minutes. The detection wavelength was 265nm. The average percentage recovery for Famotidine related compound-C was found to be 94.3%, 95.9%, 96.0% represents the accuracy of the method and for Famotidine related compound-D was found to be 95.8, 95.4 and 96.4. The %RSD for Famotidine related compound-C was found to be 5.576 and for Famotidine related compound-D was found to be 1.588 represents the precision of the method. The correlation coefficient square for Famotidine, Famotidine related compound-C and Famotidine related compound-D was found to be 0.999999, 0.9992 and 0.9991 respectively. Respective parameters met the acceptance criteria, from the results concluded that the developed method was precise and accurate.

*Corresponding Author
Name: Binoy Varghese Cheriyan
Phone: 9840677122
Email: lallybinoy@gmail.com

ISSN: 0975-7538
DOI: https://doi.org/10.26452/ijrps.v11i4.3250

INTRODUCTION
Famotidine is a competing suppressant or blocker of histamine H2-receptors. Famotidine is a propanimidamide and H2-receptor antagonist chemically called as 3-[[2-(diaminomethyldieneamino)-1,3-thiazolyl-4]methylsulfanyl]-N’-sulfamoylpropanimidamide. It is white to pale yellow crystalline composite that is readily or amply solvable in glacial acetic acid, most moderately solvable in water, moderately solvable in methanol and almost insolvable in ethanol (Langtry et al., 1989). Famotidine is a competing suppressant or blocker of histamine...
H2-receptors, it hinder or prevent nocturnal gastric acid secretion and basal by competing blockage or prohibition of the activity of histamine at the histamine H2-receptors of the lateral cells and also hinder gastric acid secretion accelerated or excited by insulin, pentagastrin, food, caffeine, betazole and physiologic vagal reflex. Comparing to ranitidine famotidine is three fold high effective or dynamic and twenty times more effective when compared to cimetidine. Feeble inhibiting of hepatic cytochrome p450 mixed function oxidase system (Rockville and Convention, 1996), (Chicago, 1994). Famotidine is effective in boosting or facilitating the restoring of stomach and duodenal ulcers and additionally in diminishing ulcer agony (Kanayama, 1999) (Soga et al., 1999). High doses are utilized for healing circumstances in which there are characterized enhance or rise in acid excretion called Zollinger-Ellison syndrome, when provided in low doses for prolonged periods of time it has been efficient in inhibiting or stopping repetition of ulcers (Borody et al., 1995) , (Hu et al., 2003). Famotidine additionally is utilized for healing heartburn and in treating or restoring ulceration and inflammation of the esophagus emerging from acid (Kirka et al., 2004) (Fujiwara et al., 2005). Prior or earlier operation famotidine provided to surgery patient (Escolano et al., 1992) to diminish the chance of aspiration pneumonitis (Vila et al., 1991) (Jahr et al., 1991).

**Method Development**

Documentation or authentication and method development plays crucial part in development analysis and production of pharmaceuticals. Method development needs a lot of efforts and implies functioning on several concepts or thoughts concurrently and therefore eventually choosing one of those (Sethi, 2001) (Shethi and Hplc, 1996). Method development employed to make sure or secure the efficiency of drug products, identification, potency and purity. There are several steps concerned in development process are:

1. Documentation of developed method
2. Development of test procedure
3. Method enhancement
4. Set up HPLC condition
5. Laboratory method authentication (Sankar, 2006) (Breaux et al., 2003)
6. Documentation statement (Sankar, 2006) (Breaux et al., 2003)

**MATERIALS AND METHODS**

**Chemicals and Reagents**

The utilized pharmaceutical preparation Famotidine Oral Suspension (Equivalent to 40mg) were formulated in-house. Famotidine API with a potency 99.68% were used. All reagents utilized were of an analytical grade. Methanol HPLC grade were procured from Finar Limited and Acetonitrile HPLC grade were procured from MerckLimited and water for HPLC ELGA purification system.

**Instrumentation**

Method development and validation was performed on HPLC instrument equipped with UV-detector using waters X-Bridge C18 (150*4.6mm), 3.5μm column chromatographic separation was achieved. The injection volume was 20μL. The run time was set 45minutes and flow rate 0.8mL/min and wavelength selected was 265nm. The Empower Software is used for processing data. Chromatographic parameters are shown in Table 1 and gradient program in Table 2.

**Preparation of solution**

**Buffer Preparation**

**Acetate Buffer pH 6.0**

The solution was prepared by dissolving 13.6 g of sodium acetate trihydrate in 1000 mL of water. Mixed well and then the solution adjusted to pH 6.0±0.05 with glacial acetic acid, then the solution filtered through 0.45 μm membrane filter and sonicated the buffer solution to degas.

**Phosphate Buffer pH 7.0**

The solution was prepared by dissolving 13.6 g of sodium dihydrogen phosphate monohydrate in a suitable container containing 1000 mL of water. Mixed well and then the solution filtered through 0.45 μm membrane filter and sonicated the buffer solution to degas.

**Preparation of Organic Mixture**

The organic mixture was prepared by mixing ACN: Methanol in the ratio of 80:20 and sonicated for 5 minutes to degas.

**Preparation of Diluent**

The diluents was prepared by mixing 900mL of pH 7.0 Phosphate buffer and 100mL of Organic mixture into suitable container and then sonicated to degas.

**Mobile Phase - A**

Used filtered and degassed pH 6.0 Acetate buffer as a Mobile Phase-A.

**Mobile Phase - B**
Table 1: Chromatographic parameters

| Chromatographic Parameters | Conditions / Specifications |
|----------------------------|-----------------------------|
| Column                     | Waters, X-Bridge C18; 150*4.6mm, 3.5μm |
| Mobile Phase-A             | pH 6.0 Acetate Buffer       |
| Mobile Phase-B             | pH 6.0 Acetate Buffer : Organic Mixture (30:70) |
| Flow Rate                  | 0.8 mL/min                  |
| Column Temperature         | 35°C                       |
| Sample Temperature         | Ambient                     |
| Wavelength                 | 265nm                       |
| Injection Volume           | 20 μL                       |
| Run Time                   | 45.0 minutes                |

Table 2: Gradient Program

| Time (min) | Mobile phase-A (%) | Mobile phase-B (%) |
|------------|--------------------|--------------------|
| 0.00       | 90.0               | 10.0               |
| 6.00       | 90.0               | 10.0               |
| 12.00      | 85.0               | 15.0               |
| 16.00      | 85.0               | 15.0               |
| 35.00      | 15.0               | 85.0               |
| 40.00      | 15.0               | 85.0               |
| 40.50      | 90.0               | 10.0               |
| 45.00      | 90.0               | 10.0               |

Table 3: Injection Sequence for Filter Validation

| Solution Name                  | No. of Injections | Purpose                                          |
|--------------------------------|-------------------|--------------------------------------------------|
| Centrifuged/Unfiltered         | 1                 | To verify the content of Famotidine related       |
| 0.45μm Nylon/2mL discard      | 1                 | Compound-C and related                            |
| 0.45μm Nylon/4mL discard      | 1                 | compound-D                                        |
| 0.45μm Nylon/6mL discard      | 1                 |                                                  |
| 0.45μm Nylon/8mL discard      | 1                 |                                                  |

**Standard Stock Preparation**

40.37mg of Famotidine RS was weighed and transferred into a 250mL volumetric flask. To that 3/4th volume of diluent was added. Sonicated to dissolve, diluted to volume with diluent and mixed well.

**Standard Preparation**

Pipetted out 2mL of Famotidine Standard Stock solution into 100mL volumetric flask. Diluted to volume with diluent and mixed well. An optimized chromatogram is shown in Figure 1

**Preparation of Sample Solution**

Transfer 5.0mL of sample into a 250-mL volumetric flask and noted down the weight of sample in mg. (Equivalent to about 40 mg of Famotidine). Added 150mL of diluent and then spiked the 10mL of Impurity-C and Impurity-D stock solution into the same sample solution. Further sonicated to 15 min-
Table 4: System suitability parameters for Famotidine

| S.No | Injection No | Peak Area for Famotidine | USP Tailing factor | USP Plate Count |
|------|--------------|--------------------------|--------------------|-----------------|
| 1    | 1            | 199934                   | 1.138              | 20264           |
| 2    | 2            | 197856                   | 1.124              | 20142           |
| 3    | 3            | 198921                   | 1.262              | 20584           |
| 4    | 4            | 195764                   | 1.142              | 20873           |
| 5    | 5            | 196328                   | 1.233              | 20285           |
| 6    | 6            | 199976                   | 1.191              | 20589           |
| Mean |              | 198130                   |                    |                 |
| STDEV| -            | 1800.45                  |                    |                 |
| %RSD | -            | 0.9                      |                    |                 |

Figure 2: Linearity Graph for Famotidine

utes with frequent intermittent shake. After the sonication, diluted to volume with diluent and mixed well. Centrifuged the sample for about 5 minutes and collected the supernatant. Filtered the clear aliquot through 0.45-µm Nylon syringe filter and collected the filtrate after discarded the first 4mL of filtrate. An optimized chromatogram of samples are shown in Figures 5 and 6.

Preparation of Placebo Solution

Transfer 5.0mL of sample into a 250-mL volumetric flask and noted down the weight of sample in mg. (Equivalent to about 40 mg of Famotidine). Added 150mL of diluent and further sonicated to 15 minutes with frequent intermittent shake. After the sonication, diluted to volume with diluent and mixed well. Centrifuged the sample for about 5 minutes and collected the supernatant. Filtered the clear aliquot through 0.45-µm Nylon syringe filter and collected the filtrate after discarded the first 4mL of filtrate.

Initialization of the Instrument

Initially the column was positioned on the instrument and switch on the instrument and column washed with distilled water for about 60min, then for stabilization of the column run the mobile phase for 30min.

Validation of Developed Method

As stated by ICH guidelines the optimized technique was validated. In accordance with above developed technique, the mobile phase were prepared and organized all parameters.

Evaluation of System Precision

System precision was tested by injecting 6 replicates of Famotidine standard. The %RSD of peak area of
Table 5: Linearity Data

| Linearity Level (%) | Famotidine Concentration (µg/mL) | Peak Area for Famotidine | Impurity-C Concentration (µg/mL) | Peak Area for Impurity-C | Impurity-D Concentration (µg/mL) | Peak Area for Impurity-D |
|---------------------|----------------------------------|--------------------------|----------------------------------|--------------------------|----------------------------------|--------------------------|
| LOQ (10%)           | 0.322                            | 19864                    | 0.084                            | 5010                     | 0.088                            | 5749                     |
| 30                  | 0.966                            | 59683                    | 0.253                            | 15015                    | 0.264                            | 16247                    |
| 50                  | 1.61                             | 99164                    | 0.422                            | 23193                    | 0.440                            | 30998                    |
| 80                  | 2.576                            | 158743                   | 0.675                            | 40108                    | 0.704                            | 47997                    |
| 100                 | 3.22                             | 198130                   | 0.844                            | 50386                    | 0.880                            | 58432                    |
| 120                 | 3.864                            | 237865                   | 1.013                            | 60463                    | 1.056                            | 70453                    |
| 150                 | 4.83                             | 297543                   | 1.266                            | 75579                    | 1.320                            | 88234                    |
| Correlation Coefficient Square (r²) |                      |                          |                                  |                          |                                  |                          |

Table 6: Data of Method Precision

| S.No | Sample           | Impurity-C |   | Impurity-D |   |
|------|------------------|------------|---|------------|---|
| 1    | Method Precision-1 | 52286      | 0.495 | 51954      | 0.486 |
| 2    | Method Precision-2 | 53256      | 0.455 | 52354      | 0.504 |
| 3    | Method Precision-3 | 52785      | 0.520 | 50454      | 0.490 |
| 4    | Method Precision-4 | 53443      | 0.515 | 50354      | 0.489 |
| 5    | Method Precision-5 | 52081      | 0.460 | 50654      | 0.498 |
| 6    | Method Precision-6 | 53506      | 0.501 | 50064      | 0.484 |
| Mean | -                 | -          | 0.491 | -          | 0.492 |
| S.D  | -                 | -          | 0.027 | -          | 0.008 |
| %RSD | -                 | -          | 5.576 | -          | 1.588 |

Acceptance criteria

The tailing factor for famotidine peak in standard preparation should not be more than 2.0. The theoretical plate count for famotidine peak in the standard preparation should not be less than 5000. The relative standard deviation for the area of famotidine peak from six replicate injections of standard solution should not be more than 2.0%.

Linearity

Linearity was performed in the concentration of the respective peaks were calculated.
LOQ(10%), 30%, 50%, 80%, 100%, 120%, 150% of working concentration of respective Famotidine, Famotidine related compound C and Famotidine related compound D average area for each level was recorded and slope, y-intercept & correlation coefficient was calculated. Graph was plotted for respective analyte peak concentration on x-axis and area response on y-axis. Linearity graphs are shown in Figures 2, 3 and 4.

**Standard Stock Preparation**
40.37mg of Famotidine RS was weighed and transferred into a 250mL volumetric flask. To that 3/4th volume of diluent was added. Sonicated to dissolve, diluted to volume with diluents and mixed well.

**Standard Preparation**
Pipetted out 4mL of Famotidine Standard Stock solution into 200mL volumetric flask. Diluted to volume with diluent and mixed well.

**Acceptance criteria**
The correlation coefficient should not be less than 0.98 for famotidine.

**Famotidine Related Compound-C Stock Preparation**
2.12mg of Impurity-C was weighed and transferred into a 100mL volumetric flask added 75mL of diluent and sonicated to dissolve. After sonication diluted to volume with diluent and mixed well.

**Famotidine Related Compound-C Preparation**
Pipetted out 4mL of Impurity-C Stock solution into 100mL volumetric flask. Diluted to volume with diluent and mixed well.

**Famotidine Related Compound-D Stock Preparation**
2.21mg of Impurity-D was weighed and transferred into a 100mL volumetric flask added 75mL of diluent and sonicated to dissolve. After sonication diluted to volume with diluent and mixed well.

**Famotidine Related Compound-D Preparation**
Pipetted out 4mL of Impurity-D Stock solution into 100mL volumetric flask. Diluted to volume with diluent and mixed well.

**Acceptance criteria**
The correlation coefficient should not be less than 0.98 for famotidine related compound-C and related compound-D.

**Method Precision**
Method precision was evaluated by injecting a blank, standard, six sample injection and one bracketing standard injection.

**Acceptance Criteria**
The %RSD for %Impurity from six (6) sample preparations should be NMT 10.0.

**Solution Stability**
Stability of standard and sample solution was demonstrated by injecting standard and sample solution with different time interval from the time of preparation. A solution was injected once in initial, 12 hours, 24 hours, 48 hours, 72 hours and 96 hours. The stability of solution shall be decided based on the area obtained at different time interval. If the results are not meeting the acceptance criteria within the time interval specified, the test can be discontinued and reported the hours up-to which the solution is found to be stable.

**Acceptance Criteria**
1. The %difference in area between initial and time points should be NMT 25.0 for Standard.
2. The %difference in %Impurity between initial and time points should be NMT 25.0 for sample.

**Specificity**
No interference should be observed from diluents, placebo and all known Impurities at the retention time of Famotidine peak.

**Accuracy**
Accuracy shall be assessed using 3 concentrations 50%, 100%, 150% by preparing triplicate sets of sample solutions. The active can be added to placebo at 50%, 100%, 150% concentrations. At each concentration, the average result shall be expressed as a percentage.

**Acceptance Criteria**
1. Overall average recovery should be between 80.0-120.0%.
2. The %RSD for recovery of triplicate preparations at each level should be NMT 10%.

**RESULTS**

**Inference**
The system suitability parameters were within the acceptance criteria and the results are presented in
### Table 7: Recovery Studies of Famotidine Related Compound - C

| Accuracy Levels | Sample # | Peak Area of Impurity-C | Amount Added (µg/mg) | Amount Recovered (µg/mg) | % Recovery | Average % Recovery | S.D & %RSD |
|-----------------|----------|-------------------------|----------------------|--------------------------|------------|-------------------|------------|
| 50%             | Sample 1 | 26084                   | 0.422                | 0.447                    | 94.5       | 94.3              | 1.73       |
|                 | Sample 2 | 26245                   | 0.424                | 0.459                    | 92.6       |                   |            |
|                 | Sample 3 | 24385                   | 0.394                | 0.411                    | 96.0       |                   | 1.8        |
| 100%            | Sample 1 | 50027                   | 0.809                | 0.837                    | 96.6       | 95.9              | 1.02       |
|                 | Sample 2 | 51856                   | 0.839                | 0.869                    | 96.5       |                   | 1.0        |
|                 | Sample 3 | 50242                   | 0.812                | 0.857                    | 94.8       |                   | 1.0        |
| 150%            | Sample 1 | 75023                   | 1.213                | 1.244                    | 97.5       | 96.0              | 1.40       |
|                 | Sample 2 | 74756                   | 1.209                | 1.276                    | 94.7       |                   | 1.5        |
|                 | Sample 3 | 74647                   | 1.207                | 1.260                    | 95.8       |                   |            |

### Table 8: Recovery Studies of Famotidine Related Compound - D

| Accuracy Levels | Sample # | Peak Area of Impurity-D | Amount Added (µg/mg) | Amount Recovered (µg/mg) | % Recovery | Average % Recovery | S.D & %RSD |
|-----------------|----------|-------------------------|----------------------|--------------------------|------------|-------------------|------------|
| 50%             | Sample 1 | 27321                   | 0.449                | 0.478                    | 93.8       | 95.8              | 2.35       |
|                 | Sample 2 | 26536                   | 0.436                | 0.459                    | 95.1       |                   | 2.5        |
|                 | Sample 3 | 26973                   | 0.443                | 0.451                    | 98.4       |                   | 1.08       |
| 100%            | Sample 1 | 52532                   | 0.864                | 0.897                    | 96.3       | 95.4              | 1.1        |
|                 | Sample 2 | 51345                   | 0.844                | 0.881                    | 95.8       |                   | 1.1        |
|                 | Sample 3 | 50951                   | 0.838                | 0.889                    | 94.2       |                   | 1.39       |
| 150%            | Sample 1 | 80127                   | 1.318                | 1.348                    | 97.8       | 96.4              | 1.5        |
|                 | Sample 2 | 76587                   | 1.288                | 1.356                    | 94.9       |                   |            |
|                 | Sample 3 | 76734                   | 1.290                | 1.336                    | 96.6       |                   |            |

### Table 9: Solution Stability of Famotidine at Room Temperature

| Time Interval | Famotidine Peak Area | Difference in Area |
|---------------|----------------------|--------------------|
| Initial       | 195765               | N/A                |
| 12 Hours      | 195542               | 0.11               |
| 24 Hours      | 195185               | 0.30               |
| 48 Hours      | 195042               | 0.37               |
| 72 Hours      | 194953               | 0.41               |
| 96 Hours      | 194596               | 0.60               |
Table 10: Solution Stability of Impurity-C and Impurity-D at Room Temperature

| Time Interval | Impurity-C Peak Area | % Difference in Area | Impurity-D Peak Area | % Difference in Area |
|---------------|----------------------|----------------------|----------------------|----------------------|
| Initial       | 52263                | N/A                  | 57450                | N/A                  |
| 12 Hours      | 51467                | 1.52                 | 57286                | 0.29                 |
| 24 Hours      | 50987                | 2.44                 | 57003                | 0.78                 |
| 48 Hours      | 50663                | 3.06                 | 56876                | 1.00                 |
| 72 Hours      | 50221                | 3.91                 | 56276                | 2.04                 |
| 96 Hours      | 50021                | 4.29                 | 56006                | 2.51                 |

Table 11: Filter Study Data of Impurity-C and Impurity-D

| Sample                  | Impurity-C Peak Area | % Difference | Impurity-D Peak Area | % Difference |
|-------------------------|----------------------|--------------|----------------------|--------------|
| Centrifuged/Unfiltered  | 53982                | N/A          | 57450                | N/A          |
| 0.45μm Nylon/2mL discard| 53563                | 0.78         | 57386                | 0.11         |
| 0.45μm Nylon/4mL discard| 53429                | 1.02         | 57245                | 0.36         |
| 0.45μm Nylon/6mL discard| 53276                | 1.31         | 57213                | 0.41         |
| 0.45μm Nylon/8mL discard| 53239                | 1.38         | 57126                | 0.56         |

Table 4. Hence the system was suitable to carry out the analysis for estimation of sample of Famotidine oral suspensions.

This method is to be employed on Famotidine oral suspensions for the purpose of determining the RS method.

**Observation**

The Correlation coefficient square ($r^2$) of Famotidine, Impurity-C and Impurity-D was found to be 0.999999, 0.9992 and 0.9991 respectively.

**Report**

The Correlation Coefficient Square ($r^2$) for Famotidine, Impurity-C and Impurity-D were met the acceptance criteria of not less than 0.998. The linear regression data shows that the method is linear over the entire concentration range (LOQ (10%)-150%) and it is adequate for its intended concentration range and results are shown in Table 5.

**Observation**

The S.D and %RSD of Impurity-C was found to be 0.027 and 5.576 then for Impurity-D 0.008 and 1.588 respectively.

**Report**

The %RSD for %Impurity from six (6)-sample preparations of Impurity-C and Impurity-D is less than 10 and the results are given in Table 6, hence the method is precise.

**Report**

1. Overall average recovery for Famotidine related compound-C is between 80.0-120.0%.
2. The %RSD for recovery of triplicate preparations at each level is NMT 10% and hence the method is accurate, results are presented in Table 7.

**Report**

1. Overall average recovery for Famotidine related compound-D is between 80.0-120.0%.
2. The %RSD for recovery of triplicate preparations at each level is NMT 10% and hence the method is accurate, results are presented in Table 8.

**Report**

1. The %difference in area between initial and time points is NMT 25.0 for standard.
2. The %difference in %Impurity between initial and time points is NMT 25.0 for sample solution and results are reported in Tables 9 and 10.
All results met the acceptance criteria. Based on above results, it is concluded that standard and sample solutions were stable up to 96 hrs respectively when stored at Room temperature.

**Specificity**

No interference was observed from diluents, placebo and all known Impurities at the retention time of Famotidine peak.

**Report**

The %difference in Peak area for Impurity between the centrifuged sample and filtered sample is NMT 25.0. Datas are reported in Table 11.

**DISCUSSION**

In the proposed project, a successful attempt has been made to develop a simple, accurate, economic and rapid RP-HPLC method for the determination of Famotidine Oral suspension, Famotidine related compound-C and related compound-D in pharmaceutical formulations. The method has been validated as per the guidelines given by ICH requirements to assure that the method consistently meets the predetermined specifications and quality attributes. The average percentage recovery for Famotidine related compound-C was found to be 94.3, 95.9, 96.0 represents the accuracy of the method and for Famotidine related compound-D was found to be 95.8, 95.4 and 96.4. The %RSD for Famotidine related compound-C was found to be 5.576 and for Famotidine related compound-D was found to be 1.588 represents the precision of the method. The correlation coefficient square for Famotidine, Famotidine related compound-C and Famotidine related compound-D was found to be 0.999999, 0.9992 and 0.9991 respectively. Respective parameters met the acceptance criteria, from the obtained results concluded that the developed method was precise and accurate.

**CONCLUSIONS**

All respective validation parameters met the acceptance criteria and it was concluded that the Related substance determination of famotidine in oral suspension by using pH 6.0 Acetate buffer as mobile phase-A and pH 6.0 Acetate buffer: Organic mixture (30:70) as mobile phase-B, pH 7.0 Phosphate buffer: Organic mixture (90:10) is diluent. The separation is achieved by using column Waters, X-Bridge C18, (150*4.6mm), 3.5μm and flow rate is 0.8mL/min. Detection wavelength is 265nm. Hence this method can be used for related substance determination of famotidine in oral suspension formulation by precise and accurate manner. The final result of the established RS method for perseverance of Famotidine indicates that the technique or procedure was precise, simple, accurate and reproducible. The developed HPLC technique indicates satisfying outcome with precision, linearity, specificity and accuracy. Hence the method is precise and accurate.

**ACKNOWLEDGEMENT**

The authors are thankful to Novitium Labs Private Limited, Chennai for providing sample for research work. The authors are thankful for Vels Institute Science Technology and Advanced Studies (VISTAS), Chennai Tamil Nadu for providing all the facilities to make this work success.

**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**

Borody, T. J., Andrews, P., Fracchia, G., Brandl, S., Shortis, N. P., Bae, H. 1995. Omeprazole enhances efficacy of triple therapy in eradicating Helicobacter pylori. Gut, 37(4):477–481.

Breaux, J., Jones, K., Boulas, P. 2003. Understanding and implementing efficient analytical methods development and validation. Pharm Technol Anal Chem Test, 5:6–13.

Chicago 1994. Council on Drugs. AMA Drug Evaluations Annual. pages 902–902.

Escolano, F., Castano, J., Lopez, R., Bisbe, E., Alcon, A. 1992. Effects of omeprazole, ranitidine, famotidine and placebo on gastric secretion in patients undergoing elective surgery. British Journal of Anaesthesia, 69(4):404–406.

Fujiiwara, Y., Higuchi, K., Nebiki, H., Chono, S., Uno, H., Kitada, K., Satoh, H., Nakagawa, K., Kobayashi, K., Tominaga, K., Watanabe, T., Oshitan, N., Arakawa, T. 2005. Famotidine vs. omeprazole: a prospective randomized multicentre trial to determine efficacy in non-erosive gastro-oesophageal reflux disease. Alimentary Pharmacology and Therapeutics, 21(s2):10–18.

Hu, F. L., Jia, J. C., Li, Y. L., Yang, G. B. 2003. Comparison of H2-Receptor Antagonist-and Proton-Pump Inhibitor-Based Triple Regimens for the Eradication of Helicobacter Pylori in Chinese Patients with Gastritis or Peptic Ulcer. Journal of International Medical Research, 31(6):469–474.
Jahr, J. S., Burckar, G., Smith, S. S., Shapiro, J., Cook, D. R. 1991. Effects of famotidine on gastric pH and residual volume in pediatric surgery. *Acta Anaesthesiologica Scandinavica, 35*(5):457–460.

Kanayama, S. 1999. Proton-pump inhibitors versus H2-receptor antagonists in triple therapy for Helicobacter pylori eradication. *Nihon Rinsho. Japanese Journal of Clinical Medicine, 57*(1):153–159.

Kirika, N. B., Bodrug, N. I., Butorov, I. V., Butorov, S. I. 2004. Efficacy of different schemes of anti-helicobacter therapy in duodenal ulcer. *Therapeutic archive, 79*:18–22.

Langtry, H. D., Grant, S. M., Goa, K. L. 1989. Famotidine. *Drugs, 38*(4):551–590.

Rockville, M. U., Convention 1996. *USPDI - Drug Information for the Health Care Professional*. Pharmaceutical Convention, Inc, U.S.

Sankar, S. R. 2006. *Text book of Pharmaceutical Analysis*. Rx Publications, Tirunelveli, 13-1, 2 edition .

Sethi, P. D. 2001. *High Performance Liquid Chromatography, Quantitative analysis of Pharmaceutical Formulation, Edn 1st*. CBS Publication, New Delhi.

Shethi, P. D., Hplc 1996. *Quantitative Analysis of Pharmaceutical Formulation*. CBS Publishers and Distributors, New Delhi.

Soga, T., Matsuura, M., Kodama, Y., Fujita, T., Sekimoto, I., Nishimura, K., Yoshida, S., Kutsumi, H., Fujimoto, S. 1999. Is a proton pump inhibitor necessary for the treatment of lower-grade reflux esophagitis? *Journal of Gastroenterology, 34*(4):435–440.

Vila, P., Vallès, J., Canet, J., Melero, A., Vidal, F. 1991. Acid aspiration prophylaxis in morbidly obese patients: famotidine vs. ranitidine. *Anaesthesia, 46*(11):967–969.