

# Comparative Evaluation of Marketed Formulations of Folic acid Tablets

Shiv Kumar Bhardwaj<sup>1</sup>, Shiv Shankar Shukla<sup>2</sup> and Rudra Pratap Singh Rajput<sup>3</sup>

Columbia Institute of Pharmacy, Tekari, Raipur, Chattisgarh, 493111, India.

<sup>1</sup>Shivbhardwaj1991@gmail.com

**Abstract:** Tablet is a solid dosage form each containing a unit dose of one or more medicament/s. Tablets are flat or biconvex discs prepared by compressing a drug or a mixture of drugs with or without suitable excipients. Folic acid is a B complex water-soluble vitamin that is essential to humans, and its deficiency can cause problems including congenital malformations in the foetus as well as heart disease. In this study the collection and evaluation of 5 brands (FOL-5, FOLIPIC, FOLIWOCK, FOLVITE, FOLITOP) of tablet of folic acid. The objective of the present study was to perform the various evaluation tests such as weight variation, hardness, dissolution, disintegration, friability, etc. for folic acid tablets. After the evaluation, the weight variation and friability of the branded tablets was within the range as specified in the Indian Pharmacopoeia (not exceed  $\pm 5\%$  deviation) and 1%, respectively. The hardness was more than 5kg/cm<sup>2</sup>. The average disintegration time of the tablet was in the range from 1.08 – 2.44 min. Thus, from the above studies, it was concluded that the 5 brands of folic acid tablet were within the specified limits as mentioned in the official books.

**Keywords:** Tablet, Branded Folic Acid tablets.,

## 1. INTRODUCTION

Tablet is a solid dosage form each containing a unit dose of one or more medicament/s. Tablets are flat or biconvex discs prepared by compressing a drug or a mixture of drugs with or without suitable excipients<sup>1-3</sup>. Tablets may be swallowed whole or being chewed. Some are dissolved or dispersed in water before administration<sup>4-6</sup>. Some are put in oral cavity, where the active ingredient is liberated at a predetermined rate. Implants or pessaries may also be presented in form of tablet<sup>7</sup>.

## 2. MATERIALS

### 2.1. Materials

**Table 1: List of different brand of folic acid tablets used for evaluation**

| Brand Name | Manufactured By  | Amount of Drug | Type of Drug |
|------------|------------------|----------------|--------------|
| Fol-5      | Zydus Healthcare | 5mg/ tablet    | Uncoated     |
| Folipic    | Pharma Corp.inc  | 5mg/ tablet    | Uncoated     |
| Foliwock   | Wockharo Ltd.    | 5mg/ tablet    | Uncoated     |

|         |                              |             |          |
|---------|------------------------------|-------------|----------|
| Folvite | Wyeth Ltd.                   | 5mg/ tablet | Uncoated |
| Folitop | Makin Laboratories Pvt. ltd. | 5mg/tablet  | Uncoated |

## 3. RESULTS

### 3.1 General appearance

#### Diameter:

**Table 5: Diameter of the tablets (in mm)**

| S. No.      | Fol – 5 | Folipic | Foliwock | Folvite | Folitop |
|-------------|---------|---------|----------|---------|---------|
| 1           | 5.3     | 5.1     | 5.4      | 5.2     | 6.5     |
| 2           | 5.4     | 5.2     | 5.4      | 5.3     | 6.5     |
| 3           | 5.4     | 5.1     | 5.5      | 5.2     | 6.5     |
| 4           | 5.4     | 5.1     | 5.6      | 5.1     | 6.6     |
| 5           | 5.4     | 5.1     | 5.6      | 5.1     | 6.7     |
| <b>Avg.</b> | 5.38    | 5.12    | 5.5      | 5.1     | 6.5     |

**Inference** – All brands of tablets were founds within the specified limits so they passes the diameter.

#### Thickness:

**Table 6: Thickness of the tablets (in mm)**

| S. No.      | Fol – 5 | Folipic | Foliwock | Folvite | Folitop |
|-------------|---------|---------|----------|---------|---------|
| 1           | 0.34    | 0.33    | 0.30     | 0.67    | 0.89    |
| 2           | 0.34    | 0.33    | 0.30     | 0.68    | 0.90    |
| 3           | 0.35    | 0.33    | 0.30     | 0.67    | 0.90    |
| 4           | 0.35    | 0.33    | 0.30     | 0.67    | 0.90    |
| 5           | 0.35    | 0.33    | 0.30     | 0.67    | 0.90    |
| <b>Avg.</b> | 0.34    | 0.33    | 0.30     | 0.67    | 0.89    |

### 3.2 Weight variation

**FOR FOLIPIC** - % deviation allowed-+ 7.5%; Upper limit- 127.92 mg; Lower limit- 110.07 mg

**FOR FOLIWOCK** - % deviation allowed- + 10%; Upper limit- 82.5 mg; Lower limit- 67.5 mg

**FOR FOLVITE** - % deviation allowed- + 5%; Upper limit- 78.1 mg; Lower limit- 63.9 mg

**FOLITOP** - % deviation allowed + 5%; Upper limit- 313.9 mg; Lower limit- 284.0 mg

### 3.3 Friability

**Table 7: Friability Test**

| Friability of tablets (in %) |         |         |       |             |
|------------------------------|---------|---------|-------|-------------|
| S.no.                        | Name of | Initial | Final | %friability |

|   | tablet   | weight | weight |      |
|---|----------|--------|--------|------|
| 1 | Fol 5    | 2.34   | 2.31   | 0.01 |
| 2 | Folipic  | 1.89   | 1.85   | 0.01 |
| 3 | Foliwock | 1.62   | 1.59   | 0.01 |
| 4 | Folvite  | 1.68   | 1.49   | 0.11 |
| 5 | Folitop  | 2.53   | 2.45   | 0.03 |

**Inference** – All brands of tablets were founds within the specified limits so they passes the Friability test

### 3.4 Hardness

**Table 8: Hardness Test**

| Hardness of tablets (in kg/cm <sup>2</sup> ) |         |         |          |         |         |
|--|---------|---------|----------|---------|---------|
| S. No.                                       | Fol – 5 | Folipic | Foliwock | Folvite | Folitop |
| 1  | 7       | 7       | 5        | 5       | 8       |
| 2  | 8       | 7       | 6        | 6       | 7       |
| 3  | 8       | 7       | 5        | 6       | 8       |
| 4  | 7       | 6       | 6        | 5       | 8       |
| 5  | 8       | 6       | 5        | 5       | 8       |
| Avg.   | 7.6     | 6.6     | 5.4      | 5.4     | 7.8     |

**Inference** – All brands of tablets were founds within the specified limits so they passes the Hardness test

### 3.5 Disintegration

**Table 9: Disintegration test**

| S.No | FO L-5   | FOLIP IC | FOLIWO CK | FOLVI TE | FOLIT OP |
|------|----------|----------|-----------|----------|----------|
| 1    | 1.16 min | 2.14 min | 1.39 min  | 1.50 min | 2.44 min |
| 2    | 1.18 min | 2.19 min | 1.41 min  | 1.54 min | 2.41 min |
| 3    | 1.12 min | 2.10 min | 1.50 min  | 1.47 min | 2.30 min |
| 4    | 1.08 min | 2.13 min | 1.55 min  | 1.66 min | 2.38 min |
| 5    | 1.30 min | 2.30 min | 1.49 min  | 1.43 min | 2.12 min |
|      | 1.33 min | 2.17 min | 1.46 min  | 1.52 min | 2.33 min |

**Inference** – All brands of tablets were founds within the specified limits so they passes the Disintegration test

## 4. DISCUSSION

As in comparative study of different brands of the Folic Acid tablets i.e. Rantac®150, Zinetac®150, Aciloc150, R-Loc150 manufactured by different companies, the following test i.e. thickness ,diameter, weight variation , hardness test , friability test disintegration test has been separately done. Now we elaborated the entire test in short ways.

- **Weight & weight variation** – The test stated that different brands of Folic Acid tablets have passed the weight variation uniformity test as specified in the Indian Pharmacopoeia (not exceed  $\pm 5\%$  deviation).
- **Hardness test** – It is important physical feature for assessing tablet. Different brands of Folic Acid tablets have acceptable crushing strength or hardness of more than 5kg/cm<sup>2</sup>.
- **Friability test** – The friability value for different brands of Folic Acid tablets were ranged from 0.01-0.001%. In different brands of Folic Acid tablets formulation the percent (%) friability was less than 1% which ensure that all the tablets were mechanically stable.
- **Disintegration test** – Tables were satisfactory as uncoated IP tablets disintegration time standards as low as 15 min. the overall disintegration time for different brands of Folic Acid tablets brands was in the ranged from 1.08 – 2.44 min.

## 5. CONCLUSION

Folic acid is vitamin. Therapeutic response of any formulation depends on its quality parameters. From the study it was identified that weight variation, friability test, and disintegration time of different folic acid tablets brands complied the specification. Small variation was obtained in hardness test. It should be strictly considered that an ideal tablet will have sufficient hardness to maintain its mechanical stability but not more. Because the harder tablet delay the disintegration time and dissolution rate .Finally, as quality control parameters are related to one another from initial step to pharmacological action of the drug a high quality tablet should meet all the standard quality parameter for getting its desired therapeutic response. All the brands of folic acid tablet were tested for the various evaluation tests weight variation hardness. Thickness, diameter, friability, disintegration & it was concluded from the study that all 5 brands of folic acid tablet were found within the specified limits as mentioned in the official books.

## REFERENCES

1. N.K Jain and S.N Sharma “ A textbook of professional pharmacy , fourth edition published by M.K Jain for vallabh prakashan , Delhi page no. 303-306.
2. Leon Lachmann, Herbert A. Lieberman the theory and Practice of Industrial Pharmacy Varghese Publishing House Bombay, Third Edition 1987.

3. British Pharmacopoeia, Vol. I & II. Govt. of India, Ministry of Health and Family Welfare, Controller of Publication New Delhi, 1996.
4. British Pharmacopoeia (2005): Volume IV. Appendix XII H A273, Table: 2.9-5.1.
5. The United State of Pharmacopoeia 24/NF26. The official compendia of United States of pharmacopoeia, Convection Inc. Rockvill, 1995; Asian Ed; 1015-1016.
6. Gupta, A.K. (1994).Tablet Introduction to pharmaceutics -I (3rd ed, pp 239-274) ,CBS publisher and Distributor, India.
7. Mehta R.M, pharmaceutics –I fifth edition reprint 2012 Vallabh prakashan Delhi p.p no – 246.