



COMPARATIVE STUDY OF MARKETED IBUPROFEN TABLET

**Jitendra Gupta, Eshan Pathak, Gazi Md. Talha, Jagdish Kshirsagar, Gaurav Kumar, Dr. Jagdish Chandra
Rathi and Devendra Dhariwal***

*NRI Institute of Pharmaceutical Sciences, 1, Sajjan Singh Nagar, Opposite Patel Nagar, Raisen Road Bhopal 462022,
MP.

***Corresponding Author: Devendra Dhariwal**

NRI Institute of Pharmaceutical Sciences, 1, Sajjan Singh Nagar, Opposite Patel Nagar, Raisen Road Bhopal 462022, MP.

Article Received on 01/10/2022

Article Revised on 22/10/2022

Article Accepted on 12/11/2022

ABSTRACT

Generic medicine is a pharmaceutical product that can be interchangeable with the innovator medicine. Generic medicine is the same as its corresponding innovator medicine in terms of quality, safety, efficacy, strength, dosage form, route of administration and intended use. However, there are misperceptions that generic medicines are less effective than branded drugs and/or generic drugs are poor quality as compared to brand medicines by health care providers and patients. There are many pharmaceutical companies and distribution channels of drugs worldwide. Unfortunately, circulation of poor quality drug products in the international market increase significantly as a result of ineffective regulation of manufacturing and trading of pharmaceutical products. Therefore, the manufacturing, distribution, storage and use of drugs need to be regulated authorized regulatory institutions. The quality of a pharmaceutical product is essential to ensure the safety of the patients. Different parameters of quality control of pharmaceutical products can guarantee the quality and bioavailability and optimal therapeutic activity. Therefore, the present study was undertaken with the aim of assuring the quality of ibuprofen tablets available in the Indian drug market.

KEYWORDS: Generic medicine, Innovator medicine, Pharmaceutical product, Ibuprofen.

INTRODUCTION

Ibuprofen was the first member of Propionic acid derivatives introduced in 1969. It is a popular domestic and over the counter analgesic and antipyretic for adults and children. Ibuprofen has been rated as the safest conventional NSAID by spontaneous adverse drug reaction reporting systems in the UK. Ibuprofen is (2RS)-1[4-(2-methylpropyl) phenyl] propionic acid (BP. 2004). Ibuprofen was the first member of propionic acid derivatives to be introduced in 1969 as a better alternative to Aspirin. Gastric discomfort, nausea and vomiting, though less than aspirin or indomethacin. It is a non-selective inhibitor of cyclo-oxygenase-1 (COX-1) and Cyclooxygenase-2 (COX-2). Although its anti-inflammatory properties may be weaker than those of some other NSAID. Ibuprofen can also be used for treatment of some pain, especially nerve pain such as sciatica, postherpetic neuralgia and referred pain for radiculopathy, in the form of a cream, ointment, liquid, spray, or gel, which may also contain ketamine and lidocaine, along with other agents which may be useful.

MATERIAL AND METHOD

Chemicals: - Ibuprofen powder, Ethanol, Chloroform, Sodium hydroxide, Phenolphthalein.

Apparatus: - Conical flask 100ml, Stirrer, Beaker, Burette and burette stand Measuring cylinder, Filter Paper, Butter Paper.

Process Description

Weight and powder 20 tablets, weight accurately a quantity of the powder equivalent to 0.5g of ibuprofen extract with 60 ml of chloroform for 15 minutes and filter, wash the residue with three quantities, each of 10 ml of chloroform and gently evaporate the filtrate just to dryness in a current of air. Dissolve the residue in 100 ml of ethanol (95%), previously neutralized to phenolphthalein solution, and titrate with 0.1M sodium hydroxide using phenolphthalein solution as indicator. Each ml of 0.1M sodium hydroxide is equivalent to 0.02063 g of C₁₃H₁₈O₂.

Calculation

As we know,
1ml 0.1 M Sodium Hydroxide = 0.02063 g of Ibuprofen
Now, calculating the percentage purity of each brand which is given below:

Brand A

For Brufen (Abbott)
From equation,

1.0ml 0.1M NaOH =0.02063gm Ibuprofen
 23.0ml 0.1M NaOH =23 × 0.02063 =0.474gm
 Ibuprofen

$$\% \text{ purity of Ibuprofen} = \frac{\text{amount of Ibuprofen} \times 100}{\text{Weight of Sample}}$$

$$= \frac{0.474 \times 100}{0.5} = 94.8\%$$

Brand B

For Ibuprofen (Modi) From equation,
 1000ml 1M NaOH =206.3gm Ibuprofen
 23.5ml 0.1M NaOH =23.5 × 0.02063 =0.484gm
 Ibuprofen

$$\% \text{ purity of Ibuprofen} = \frac{\text{amount of Ibuprofen} \times 100}{\text{Weight of Sample}}$$

$$= \frac{0.484 \times 100}{0.5} = 96.8\%$$

Brand C

For Cipla (Cipla)
 1.0ml 0.1M NaOH =0.02063gm Ibuprofen
 23.6ml 0.1M NaOH =23.6 × 0.02063 =0.486gm
 Ibuprofen

$$\% \text{ purity of Ibuprofen} = \frac{\text{amount of Ibuprofen} \times 100}{\text{Weight of Sample}}$$

$$= \frac{0.486 \times 100}{0.5} = 97.2\%$$

Brand D

For Elite (Elite Pharma)
 1.0ml 0.1M NaOH =0.02063gm Ibuprofen
 24.0ml 0.1M NaOH =24 × 0.02063 =0.495gm
 Ibuprofen

$$\% \text{ purity of Ibuprofen} = \frac{\text{amount of Ibuprofen} \times 100}{\text{Weight of Sample}}$$

$$= \frac{0.495 \times 100}{0.5} = 99.0\%$$

Brand E

For Kopran (Kopran Pharma)
 1.0ml 0.1M NaOH =0.02063gm Ibuprofen
 24.2ml 0.1M NaOH =24.2 × 0.02063 =0.499gm
 Ibuprofen

$$\% \text{ purity of Ibuprofen} = \frac{\text{amount of Ibuprofen} \times 100}{\text{Weight of Sample}}$$

$$= \frac{0.499 \times 100}{0.5} = 99.8\%$$

S. No.	Brand Name	Percentage Purity (%)
1.	A	94.8%
2.	B	96.8 %
3.	C	97.2%
4.	D	99.0%
5.	E	99.8 %

RESULT

Taking into account the results of tests carried out during this study, all different productions of Ibuprofen available in the Indian market meet the requirements of ISP. Although, in some brands they claim the percentage purity to be more than 99%, but from our study we found it to be slight less. The percentage purity of the Ibuprofen tablets of different brands which we took from the market was around 95-99% which is sufficient enough considering some human errors which might have occurred during experiments.

REFERENCE

1. Tripathi KD. Non steroidal anti inflammatory drugs and anti pyretic analgesics. In: Essentials of medical pharmacology. 5th edn., Jaypee Brothers, New Delhi, 2003. p. 176.
2. Abrahm P. KI KD. Nitro-arginine methyl ester, a non selective inhibitor of nitric oxide synthase reduces ibuprofen-induced gastric mucosal injury in the rat. Dig Dis., 2005; 50(9): 1632-1640.
3. Bradbury F. How important is the role of the physician in the correct use of a drug? An observational cohort study in general practice. Int J Clin Prat, 2004; (144): 27-32.
4. Chavez ML, DeKorte CJ. Valdecoxib: a review. Clin Ther, 2003 Mar; 25(3): 817-851.
5. Wahbi AA, Hassan E, Hamdy D, Khamis E, Barary M. Spectrophotometric methods for the determination of Ibuprofen in tablets. Pak J Pharm Sci., 2005 Oct; 18(4): 1-6.