Panacea Journal of Pharmacy and Pharmaceutical Sciences 2015:4(3);705-710

International Journal

PJPPS

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Panacea Journal of Pharmacy and Pharmaceutical Sciences

ISSN: 2349 7025

Original Research Article **Volume 4 Issue 3**

EVALUATION OF COMMERCIALLY AVAILABLE CONVENTIONAL RELEASE MELOXICAM TABLETS (7.5MG)

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Article history:

Received: 29th June 2015

Received in revised form: 17th July 2015

Accepted: 25th August 2015

Available online: 30th September 2015

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These authors have no conflict of interest to declare.

Abstract:

The main objective of the present study was to investigate which of the commercially available brands of Meloxicam tablets of 7.5mg is more bioavailable in lesser time. Four different brands of meloxicam were purchased from the local market and were evaluated comparatively for hardness, friability, weight variation, and disintegration time and dissolution test. *In vitro* disintegration was carried out in different media to know the effect of different media on disintegration time. The brands were named as "A, B, C, and D". The brand A shows most abrupt release but after 45minutes the amount of drug screened in each bowl of dissolution apparatus is nearly same.

Key words: Meloxicam, bioavailability, disintegration, dissolution

INTRODUCTION:

Meloxicam is a non-steroidal anti-inflammatory drug. It belongs to the oxicam class and is used to sub side fever, primary dysmenorrhoea, and joint pains and also used as analgesic. It acts by inhibiting the enzyme cycloxygenase (COX). It also possesses anti-inflammatory properties. It is safer than other drugs used produce analgesia [1].

This enzyme is responsible for the conversion of arachdonic acid into prostaglandin. Meloxicam is the selective inhibitor of COX-2 over COX-1 even at its low therapeutic dose. A primary advantage of oxicam family of drugs is their long half-life which permits the once daily dosing. In the patients with gastric disease low dose is required i.e. 7.5mg. As compared to other NSAIDs it is safer.

MATERIALS AND METHODS:

Materials:

Meloxicam pure salt was gifted by Local Pharmaceutical Industry (Multan, Pakistan) and different brands were purchased by local market.

Code name	Batch no.	Mfg. date	Exp. date
A	040	11-2013	11-2015
B	0046	1-2014	1-2016
C	101638	10-2013	10-2015
D	023	5-2013	4-2015

Methods:

Evaluation of tablets:

1) Hardness:

The crushing strength of the tablets was measured using Monsanto hardness tester. The tablets were tested randomly and average reading was noted.

2) Friability:

Tablets were weighed and placed in a Roche friabilitor and it was rotated at 25rpm for 4 minutes. The tablets were removed, dedusted and reweighed. The percentage friability was determined as per following formulae

%age friability = initial weight – final weight/initial weight *100

3) Weight variation:

The twenty tablets were selected randomly and the mean weight is determined.

4) Disintegration time:

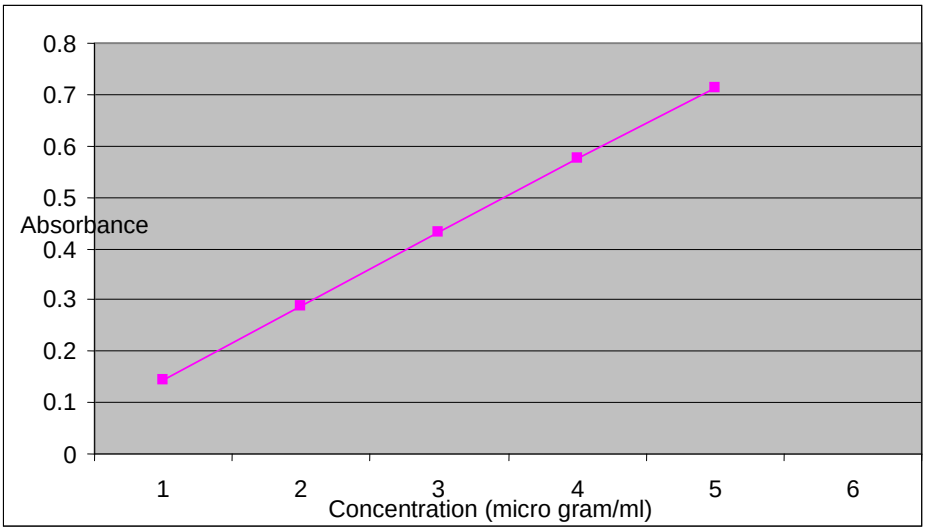
Disintegration time was evaluated by using disintegration apparatus using 900 ml of water and also tested in different Medias like milk (pH 6.52), juice (mango pH 3.02) and Pepsi (pH 2.4).

Formulations	**Hardness(newtons)**	**Friability(n =10)**	**Weight variation (n =20)**
A	25 N	0.10	1.862
B	30N	0.05	1.727
C	50N	0.37	2.646
D	15N	0.07	1.207

	Disintegration time in different medias			
Formulation	**Water**	**Juice**	**Pepsi**	**Milk**
A	30 sec	90sec	50 sec	40 sec
B	26 sec	167 sec	65 sec	50 sec
C	20 sec	210 sec	145 sec	125 sec
D	210 sec	668 sec	480 sec	330 sec

5) *In vitro* drug release study:

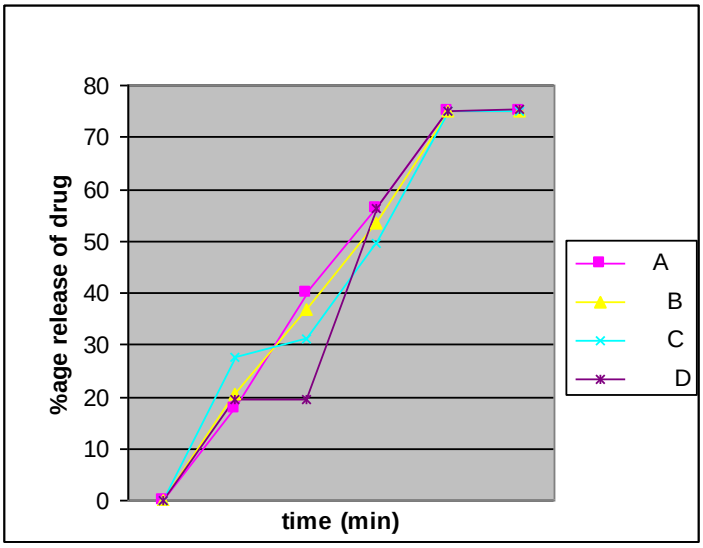
In vitro drug release studies of all formulations were carried out using the tablet dissolution test apparatus (USP XXII type II) at 50 rpm. Phosphate buffer of pH 1.2 was prepared and the tablets were placed in each beaker of the apparatus. The samples are withdrawn at different intervals and analyzed by UV spectrophotometer at 273nm.



Standard curve of meloxicam salt

Values of percentage of drug released (mg) in dissolution media of different brands:

Time (min)	A	B	C	D
0	0	0	0	0
5	17.85	20.5	27.61	19.61
10	40.15	36.7	31.25	19.64
15	56.28	53.45	49.58	56.23
30	74.88	75	74.89	75.01
45	74.95	75.09	75.07	75.41



RESULTS AND DISCUSSIONS:

The hardness of the tablets was evaluated and the results are expressed in Newton's. The friability values of all the brands are below 1% which is the indication of good mechanical strength of tablets. All tablets pass the weight variation test as the %age variation is within the pharmacopoeial limits of 10% of weight.

The disintegration time of the tablets is also shown in table which is also in the pharmacopoeial limits (15 mins for uncoated tablets B.P 2009)

The *in vitro* dissolution profile shows brand A shows the faster release of drug.

Conclusion:

The mechanical strength of the meloxicam is sufficient to withstand the handling hazards, friability is within the pharmacopoeial limits and weight variation is also within the limits.

The disintegration results within different Medias with different pH shows that it disintegrates faster in basic Medias as compared to acidic ones.

The meloxicam tablet brand labeled as A shows the faster release of drug so the *in vitro* dissolution performance of the meloxicam A in comparison to other brands is better.

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