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Synthesis And Drug Release Study Of Voltaren Ophthalmic Solution By Using Natural Polymers

Ms. Jyoti Rai [1], Dr. Gazala Parveen [2]

1. **Research Scholar, Department of Pharmacy, Sunrise University, Alwar (Raj.) INDIA**
2. **Research Supervisor, Department of Pharmacy, Sunrise University, Alwar (Raj.) INDIA**

Abstract:

A major problem being faced in ocular therapeutic is the attainment of an optimal concentration at the site of action. The bioavailability of diclofenac sodium in the form of eye drop is very low and when the drug is administered in the form of ophthalmic suspension it lead to irritation due to particle size. So in the present study diclofenac sodium solution were developed with the aim of promoting the prolong release of drug using natural polymer. Diclofenac sodium solution were sterilised and assessed for various parameters like clearity, viscosity, pH, extrudability and sterility. In Vitro drug release determined using dialysis membrane in phosphate buffer pH 7.4. Ocular irritation studies were performed on albino rabbits.

Keywords: solution; prolong release, opthalmic preparation, natural polymer.

Introduction :

Preparations to the eye are ususally administered in the form of eye drops. This dosage form presents inconvenience of a low bioavalilability and pulse entry. The concentration of the drug avaliable for activity decrease exponentially as a medication is diluted by tears and is estimated from eye via the lachrymal drainage system. Due to low bioavaliablity of eye drops viscous liquid and semisolid preparation were tried as alternative therapeutics system. The bioavailability of these medicines can be increased by increasing the viscosity of the preparation up to solution like consistency using various polymers like carbopol-940, sodium carboxy methyl cellulose, hydroxy propyl methyl cellulose etc. the use of such vehicles proved to enhance the Ocular

bioavailability or the therapeutic efficacy of applied drugs, prolong the drug duration and reduce the patient non compliance problem.

Diclofenac sodium is benzene acetic acid, [2,6-dichlorophenyl) amino]- monosodium salt. Diclofenac sodium is an analgesic and anti-inflammatory drug. In acute infection, 2-4 drops of diclofenac sodium eye drop is administered for every 15 to 30 min. initially. From this it is clear that this dosage form has several drawbacks such as frequency of administration, loss of drug from tear flow, lachrymal and nasal drainage, patient non-compliance etc.

To overcome this problem, attempt has been made to formulate solution of diclofenac sodium in the present study using polymer sodium alginate.

Experimental :

Materials: Diclofenac sodium was obtained as gift sample from Swiss Medicare Pvt. Ltd. Alwar, Rajasthan, sodium alginate polymer was obtained as gift sample from Coral Pharma Chem., Alwar other chemicals and reagents used were of analytical grade.

Method :

Preparation of solution:

Potassuim dihydrogen orthophosphate, diclofenac sodium, EDTA, sodium alginate were dissolved in water under agitation with mechanical stirrer, methyl paraben, propyl paraben and PEG 400 were added to it under continous stirring polymer was slowely sprinked on the surface of purified water for uniform distribution. 3 different concentration of polymer is taken to get three different formulations A, B and C. The solution was buffered at pH 7.4 as given in table no. 01.

Evaluation :

pH:

The pH is determined by 2.5 gm of solution was dispersed in 25 ml of purified water and pH is measured by pH meter.

Ocular toxicity testing:

This testing was done on the healthy rabbit in eye of rabbit eye, no swelling and irritation observed.

In-vitro drug release:

In-vitro release studies were carried out using bichambered donor receiver compartment model (Franz diffusion cell). Accurately weighed 0.3 gm of solution was spread uniformly on a dialysis membrane, which was in contact with receptor medium. The receptor medium was stirred continously at 20 rpm to stimulate blinking action of eyelids. Samples were withdrawn at periodic interval. The drug content was anlaysed using UV-Spectrophotometer at 271 nm against reference standard using distilled water as blank as given in table no. 02.

Results and Discussion

Prepared controlled release solution of diclofenac sodium along with three different natural polymer quantities (sodium alginate in three formulations A, B and C in three different quantities 3, 4, 5 gm).

On the basis of above discussed parameter formulations C, B and A have been reported to provide the release upto 9h, 8h and 6h respectively. On the basis of this observation drug along with sodium alginate in formulation C has better release profile than other.

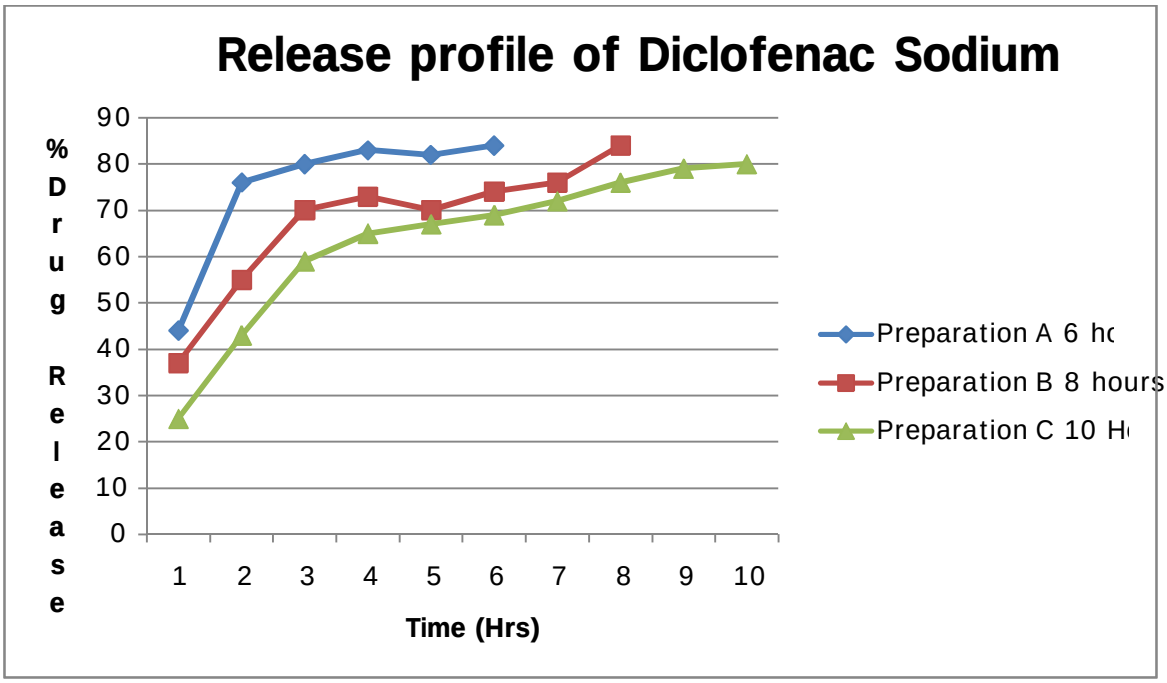
Table 1 Formulation of diclofenac solution

Ingredients	A	B	C
Diclofenac Sodium (gm)	0.3	0.3	0.3
Sodium alginate (gm)	3	4	5
Disodium Edetate (gm)	0.01	0.01	0.01
Benzalkonium chloride (%)	0.01	0.01	0.01
Propylene glycol (%)	10	10	10
Potassium Dihydrogen o-phosphate	0.908	0.908	0.908
Disodium hydrogen o-phosphate (gm)	2.38	2.38	2.38
Purified water q.s. (gm)	100	100	100

Table 2 - Drug release study of Diclofenac solution

S.No	Time (hours)	A	B	C
1	1	44%	37%	25%
2	2	76%	55%	43%
3	3	80%	70%	59%
4	4	83%	73%	65%
5	5	82%	70%	67%
6	6	84%	74%	69%
7	7		76%	72%
8	8		84%	76%
9	9			79%
10	10			80%

Fig. 1 Release profile of Diclofenac Sodium



Reference:

1. S.P. Vyas, R.K. Khar, “Targeted & Controlled drug delivery” Novel carrier system, CBS publishers and Distributors, New Delhi, Page no.122.
2. N. K. Jain “Pharmaceutical Product development”, CBS Publishers and distributors, New Delhi, page no.182.

3. Textbook of therapeutics drug and disease management, Eric T. Herfindal Dick R., Seventh edition page no.1038.
4. USP "The Official Compendia of standard" First annual Asian edition 2002, Page no.554.
5. Encyclopedia of pharmaceutical Technology, Third edition Vol. 3, Page no. 567.