

Evaluation of Buccal Absorption of Diclofenac Sodium Using Suitable Method

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Abstract: Buccal drug delivery development is increasing these days as it enhances drug bioavailability, avoids first-pass metabolism, provides the means for rapid drug transport and offers patient compliance. The main aim of this research work is to evaluate the buccal absorption of Diclofenac sodium. For this purpose the calibration curve of Diclofenac sodium is prepared in phosphate buffer pH 7.4 and the absorption of Diclofenac is evaluated in the buccal cavity. Drug absorbed calculated was 53.35% which suggested that the drug has good buccal absorption capacity.

Key words: Buccal drug delivery • Systemic circulation • First-pass effect • Mucosal route

INTRODUCTION

Oral route is the most common route of drug administration by which the swallowed drug enters the systemic circulation. 90 % of all drugs are given using oral route. But in the oral route there is a difficulty in swallowing tablets and capsules mainly in geriatric and pediatrics patients by which the prescribed medication is not taken properly causing ineffectiveness in therapy. Also it is not suitable route for the bed ridden and ill patients. In these cases oral mucosal route is mostly preferred [1,2]. Drug deliveries through the mucous membrane can be done either by sublingual route or by buccal or local route [3]. Mucosal route have advantages of bypassing the hepatic first-pass effect and it also avoids the pre systemic elimination within the GIT [4].

In the buccal drug delivery the drug is administered through the buccal mucosa (the lining of the cheek) directly into the systemic circulation [3,5-7]. It has advantages of high patient acceptability, rapid action, by passage of GIT and hepatic portal system, increased bioavailability, improved patient compliance, sustained drug delivery etc [2,6,8]. The buccal mucosa in comparison with the other mucosal tissues is more permeable, robust and has a lesser tendency to cause irritation or damage [2]. Therefore many new researches are carried out in the present scenario to prepare mucoadhesive systems with various categories of drugs like anti-inflammatory, anti-neoplastic, analgesics, anti-anginal etc [3].

MATERIALS AND METHODS

Diclofenac sodium was purchased from Central Drug House (P) Ltd. New Delhi. Polymers were supplied as "required no purification before use".

Preparation of Calibration curve of Diclofenac sodium: 100 mg of Diclofenac sodium was accurately weighed and dissolved in 30 ml of phosphate buffer (pH 7.4), further the volume was made upto 100 ml using phosphate buffer to prepare Stock solution. From this stock solution, different concentrations of 2,4,6,8 and 10 μM were prepared and the absorbances of prepared solutions were measured at 276nm in UV spectrophotometer [9-11].

Evaluation of buccal absorption: 20 mg of Diclofenac Sodium was weighed and dissolved in 20 ml phosphate buffer (pH 7.4). This solution was taken in volunteer's mouth and in the mouth it was circulated 300-400 times round in mouth for 10 mins. The volunteers were instructed to rinse the mouth with buffer solution (10 ml) for 10-20 sec and made to expel it out. The expelled solutions were combined and the required dilutions were done. Absorbance was determined using UV spectrophotometry. [12].

RESULTS AND DISCUSSION

Calibration curve of Diclofenac sodium was prepared in phosphate buffer (pH 7.4) as shown in figure1. The R^2 value was found to be 0.998.

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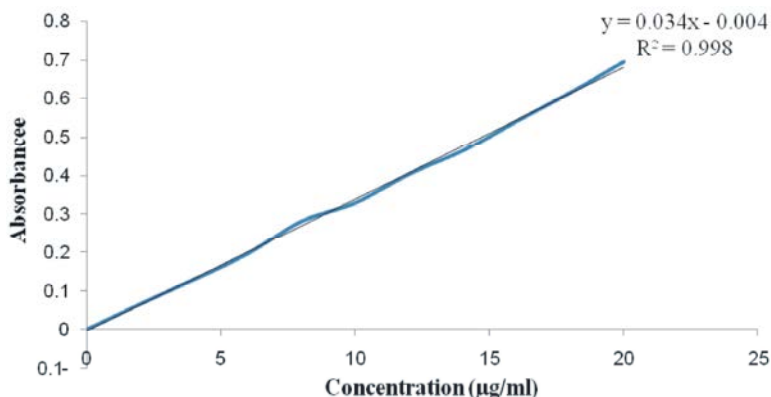


Fig. 1: Calibration curve of Diclofenac sodium

Table 1: Estimation of buccal absorption of Diclofenac sodium

S.No.	Sample	% drug absorbed
1.	1	50.32
2.	2	53.8
3.	3	55.91
		Avg.=53.35%

Evaluation of buccal absorption of Diclofenac sodium was done according to the standard procedure. % drug absorbed was found to be 53.35%. The results of buccal absorption evaluation are summarized in Table 1.

CONCLUSION

It is concluded from the research work that the buccal absorption of diclofenac sodium in phosphate buffer 7.4 is good. % drug absorbed was found to be 53.35% which concludes that the given drug has good buccal absorption capacity.

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