

# An Overview on Buccal Patches

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**Abstract:** *Buccal patches were found to be an efficient mucoadhesive drug delivery system and has the potential to produce pharmacological action that is equivalent to the action of similar drugs. Muco adhesive patches consist of active drug molecule and other additives such as polymers, softeners and permeation enhancers. Bioadhesive type of buccal patches would enhance the viscosity and would lead to validating the efficacy of the drug action. In this review we tried various types of buccal patches and recent advancements which were made to it for effective treatment of various heinous disorders.*

**Keywords:** Polymers; Solid Buccal patches; Bioadhesion; Permeation enhancer

## 1. Introduction

There are different routes for the administration of drugs in that oral route is most suitable and easily accepted by the patients. The main demerit of oral route of administration is the concentration of the drug get reduced before it enter into the systemic circulation and deactivation of neurotransmitter by enzymes in GI tract Muthat obstructs the intake of particular class of drugs especially proteins and peptides. Buccal mucosa is the potential site for the administration of drugs. The drugs which are administered through the nasal route has better advantage over oral route for systemic drug delivery. It involves first pass hepatic effect, enzymatic degradation for certain class of drugs. It offers better enzymatic degradation for the absorption of drugs. For the novel drug delivery systems different routes are tested for the administration of drugs in that oral route is the most preferred route for the localized drug delivery to the tissue in the treatment of bacterial and fungal infection. The biological surface can be epithelial tissue. The adhesion of drug to mucous is known as mucoadhesion. Buccal patches offers greater advantage over devices of mucoadhesion. The gels are easily administered by the oral route than mucoadhesive route because the gels get easily washed by the saliva. Buccal route of drug delivery helps in passage of drug directly into the systemic circulation by passing through jugular vein and first pass effect leads to increase in bioavailability. The main advantage Easy accessibility, less enzymatic activity, suitable environment for drugs, administration of drugs without pain, uniqueness in designing for local drug delivery system.

### Buccal mucous membrane site of drug delivery

The organ mucous membrane was most well-liked and simply will pass into circulation and rapid absorption of assorted medicine that area unit well accepted by the patients. Though the organ route permits the passage of assorted liquids and gases however it's not most well-liked for oral trans tissue layer drug delivery system as a result of it lacks area between the graceful muscle and find clean by the secretion it results in unable to put the device. The organ route has high quantity of blood provide and it will result in immediate action which would certainly cluster of medication inside short amount of your time with exceptional dose kind. The foremost

disadvantage for drug delivery of buccal mucous membrane is it permits less passage of fluids and it results in low bioavailability.

Oral route provides 3 varieties for the drug delivery they are:

- Sublingual
- Buccal
- Local drug delivery

### Merits of buccal drug delivery

The main advantage for drug delivery in buccal mucous membrane is it permits direct passage of drug into circulation and prevents initial pass impact. the dose kind will simply administered and faraway from the site of applications. The smooth muscle to blame for the administration of effective dose forms. Oral route of administration is most suitable route and simply accepted by the patients. The maximum absorption rate because of the shut contact with membrane absorption and diffusion barriers area unit faded. It permits passive drug absorption with none activation.

### Limitations of buccal drug delivery

The main disadvantage of buccal drug delivery is maintenance of device at explicit position for many hours in against buccal movement and secretion. It permits less area in tissues for the administration of medication when put next to different route of administration.

- 1) The buccal membrane permits less passage of fluids and gases when put next to the organ membrane
- 2) This route won't permit the administration of medication results in irritation of mucous membrane.
- 3) The dilution of drug because of the continual secretion of secretion

### Buccal drug delivery systems

Bioadhesive polymers are largely utilized in buccal drug delivery systems. The dosage forms that are administered by oral route shouldn't cause allergic reaction and well accepted by the patients. The gels containing water will not meet the necessities of patient. The gels causes accumulation of fluid in it once it's dissolved in liquid media

The composition of buccal muco adhesive patches area unit :-

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- 1) Drug
- 2) Polymers
- 3) Backing membrane
- 4) Softener
- 5) Penetration enhancers

**Drug:** The importance of drug chemical science, pharmacokinetic, organic chemistry characteristics leads difficulties in diffusion through buccal patches it includes mass and freezing point. The drug that is chosen for the drug delivery of buccal mucous membrane supported its pharmacokinetic properties.

#### **Polymers:**

The relationship between the buccal mucous membrane and also the formulation is that the major think about action of buccal delivery.

The materials that adhere to buccal mucous membrane area unit results in following steps:-

- Polymers containing group teams, wetting of mucous membrane and their chemical bonding with conjugated protein.
- The colloidal gel polymers that area unit derivatives of polyose like CMC, MC, HEC area unit used for the bioadhesion.
- The polymers that don't seem to be soluble in water or secretion used for achieving controlled drug delivery.

#### **Backing membrane:-**

When the solution of chemical compound passed into the water impermeable film that don't permit the passage of fluids for the preparation of backing membrane patches. The most advantage for the backing membrane is it permits single direction flow into buccal mucous membrane. It avoids dissolution of drug in secretion and it prevents swallowing resulting in blockage of contact between drug and secretion.

#### **Plasticizer:-**

The choice of plasticizer was completely based upon the efficiency of plasticizer material that cause chemical reactions which differentiates chemical compound - chemical compound interactions of varied drugs.

#### **Permeation enhancers:-**

The substance that permits passage of medication into buccal animal tissue area unit referred to as as penetration enhancers.

#### **Bioadhesion:-**

Bioadhesive is that the substance that is capable of interaction with material that is gift within the body and gift as along for the restricted amount of your time. The polymers which are accepted pharmaceutically used to increase the viscosity of products help to control the problems of oral cavity.

They are divided into 3 types:-

- *Bioadhesion between the layers gift within the body while not the employment of artificial materials.*

- *Bioadhesion is marked by cell adhesion into culture dishes.*
- *Adhesion of artificial materials to biological substrate*

#### **Mechanism of bioadhesion:-**

Bioadhesion involves three stages they are:-

- 1) The relationship between the bioadhesive and membrane from wetting of adhesive or swelling of bioadhesive.
- 2) The passage of bioadhesive into tissue.
- 3) The penetration between the chains of bioadhesive with mucous secretion surface.

#### **Structure of Mucous membrane**

The oral cavity is split into 2 varieties they are:-

- Outer oral vestibule- which is roofed by lips, cheeks and also the oral cavity
- Borders:- Each of them have edges in the area unit fashioned by the soft and surface. all-time low a part of mouth and also the base of mouth that is gift at back facet opens into the tubular cavity and tonsils

#### **Evaluation:-**

**Surface pH:-**Buccal patches take 2hrs to swell on the surface of agar plate. The pH is measured with help of pH paper.(8)

**Thickness measurements:-** The electronic digital micrometer is used to measure the thickness of the film in the centre and four corners which is at five locations.

**Swelling study:-**The buccal patches are placed on the 2% agar gel by weighing it on a balance and incubated at 37 degrees and observed for the physical changes. For every one hour difference about 3hours, gel plates are used to remove the buccal patches and excess of water present which is present on the surface is removed with the help of filter paper.

#### **Water absorption capacity test:-**

The patches which are rounded having surface area about 2.3 cm which are prepared in the saliva allowed to swell on the surface of agar plates.

**Folding endurance:-**The folding of buccal patch repeatedly at the same place until it get broken 300 times manually

**Tensile strength:-**The patch tensile strength was determined by with help of digital tensile meter

**Permeation study of buccal patch:-** The compartment of receptor is filled with the help of phosphate buffer PH 6.8 the compartment is stirred at 50rpm with help of magnetic bead for the maintenance of hydrodynamics.

## **2. Conclusion**

Mucoadhesive buccal patches were reportedly considered an interesting area of novel drug delivery system as the dosage forms designed for buccal administration which would not cause irritation and should be small and flexible enough to be accepted by the patient. These requirements were met by

utilising hydrogels. Hydrogels are hydrophilic forms of matrices that were capable of swelling which were dispersed in aqueous media. Normally, hydrogels were crosslinked so that they would not get dissolved in the medium but only absorb water. The other method of constituting these buccal patches was collectively by mixture of mucoadhesive polymer methylene cellulose, alcohol or else water in combination with polyvinylpyrrolidone and glycerin. These patches were reportedly made to undergo fabrication by solvent casting technique.

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