

## LOZENGES: A MUCOADHESIVES

Bhagyashri Trigune, Snehal Kale

Submitted: 15-15-2023

Accepted: 25-12-2023

### ABSTRACT :

Lozenges are solid unit dosage form administered orally for local as well as systemic effect. In a category of mucoadhesives lozenges being a popular dosage form, manufactured since 20<sup>th</sup> century. Both medicated and non medicated lozenges have great demand due to its advantages, beside it has some disadvantages too. Different types of lozenges, excipients used in formulation with its role and formulations procedure for medicated lozenges is discussed with its packaging and storage. Also highlighted the various drug categories which can be formulated into lozenges with example of each class. Lozenges is a mostly accepted dosage form in paediatrics and geriatrics patients, will have a bright future as novel drug delivery system.

### Keywords :

Lozenges, Excipients, Sweeteners, Troches, Medicament, Pastilles.

### I. INTRODUCTION :

Oral route of drug administration is very cheapest and easy route of administration. Many oral preparations are marketed since many years, one of them the mostly accepted preparations specially in children's are lozenges. Different size, shaped, coloured and flavoured lozenges with or without medicament attracts children's as well as adults too. So there is possible to administered the various drugs in form of lozenges not only in paediatrics and geriatrics but also in patients who has mental disability to take any drugs.

Lozenges are a solid doses form containing a mixture of sugar syrup and active ingredients with formulating excipients. They are moulded into various attractive shapes and sizes and sometimes packed in interesting way which is well accepted in paediatrics. Lozenges are useful for local as well as systemic delivery of various drugs. Mostly lozenges are OTC products but in some cases requires prescription prescribed by physician.

**Definition :** Lozenges are solid dosage forms made up of flavouring and sweetening agents which is dissolved and or disintegrates slowly in mouth cavity.

### Types :

1. **Medicated lozenges :** These are the lozenges which contain active pharmaceutical ingredient along with flavouring and sweetening agents and other excipients. Ex. Strepsils.
2. **Non-medicated lozenges :** These are the types of lozenges prepared without any active pharmaceutical ingredient. Ex. Candy, lollipops.

### Advantages :

- i. Give a desired effect by increasing contact time of medicine in oral cavity.
- ii. Easy, cheap and attractive way of administration.
- iii. No water is needed for administration.
- iv. It may reduce dose frequency.
- v. It helps to overcome the problems of GI discomfort of some drugs.
- vi. Systemic delivery is also possible with lozenges.
- vii. Lozenges has great patient acceptance.

### Disadvantages :

- i. Not suitable in infants.
- ii. Children's not realise the actual doses form, it considered it as a candy.
- iii. Hard lozenges becomes grainy.
- iv. Because of sugar is used as main ingredient it becomes sticky and hygroscopic nature.

### Medicaments incorporated into lozenges :<sup>[8]</sup>

1. **Local anaesthetic:** To reduce pain from minor mouth problems. Ex. Lidocaine, Benzocaine.
2. **Antihistamines :** Useful in sore throat treatment. Ex. Loratadine, Diphenhydramine HCl.
3. **Antitussive :** To treat throat irritation or cough. Ex. Herbal drugs like Dashmola, Gokhru, Turmeric, Tulsi, Ginger, Mint, etc.
4. **Antiseptics :** Bactericidal effect in sore throat condition. Ex. Amylmetacresol, Dichlorobenzylalcohol, Hexyl resorcinol.

5. **Analgesics** :Used in relieve body pain, headache, tooth ache,etc. Ex. Aspirin,Acetaminophen, Codeine, Ketamine.
6. **Decongestants** :To treat congestion due to allergies and common cold. Ex. Phenyl propanolamineHCl.
7. **Demulcent** : Cooling and soothing effect in throat. Ex. Pectin, Glycerine, Honey, etc.
8. **Antibiotics** : To terat fungal infection in mouth cavity. Ex. Clotrimazole, Miconazole, Amphotericin B.

**Classifications of lozenges :**

1. **On the basis of effect produced :**

- i. **Local effect** :Antiseptics, Decongestants.
- ii. **Systemic effect** :Vitamins, Nicotine.

2. **On the basis of appearance:**

- i. **Chewable medicatedlozenges** :This type of lozenges are made with the help of caramel base which gives it a chewy texture.Mainly the strong fruity flavoures are added into it to mask the acrid test of glycerine. Also known as “gummy type” candy lozenges. Mostly accepted by paediatrics patient.



Fig. 1 Chewable lozenges

- ii. **Soft lozenges** : it is also like as chewable lozenges used for longer duration of action

in mouth cavity. A sustained release or delayed release formulations is possible with soft lozenges. The main formulary ingredients in soft lozenges are acacia and silica gel, sometimes chocolate or sugar acacia base is also used.



Fig. 2Soft lozenges

- iii. **Hard Lozenges** :Hard candy lozenges are the formulations of sugar and other carbohydrates in amorphous state. These are shiny or glossy lozenges look like strong syrup of sugars. These type of lozenges are slowly dissolved in mouth and should not be disintegrate.



Fig. 3 Hard lozenges

**Criteria for the manufacturing of lozenges :**

1. Selection of API.
2. Selection of other appropriate excipients.

**Excipients used in formulation of lozenges :<sup>[5]</sup>**

Sr.No.	Name	Examples	Use/ Role
1	Vehicles (Sugar/Sugar free)	Dextrose,Sucrose, Maltose,Lactose, Mannitol,Sorbitol, PEG 600 and 800.	Used as sweetness and to mask unpleasant taste.
2	Bulking agents	Calcium sulfate, Dicalciumphosphate, Calcium carbonate, Lactose,	Used to improve flow property and increase the bulk size of formulation.

Sr.No.	Name	Examples	Use/ Role
		Microcrystalline cellulose.	
3	Lubricants	Magnesium stearate, Calcium stearate, Stearic acid & PEG, Vegetable oils and fats	Used for easy re moulding or to overcome stickiness of candy in mouth.
4	Binders	Acacia, Corn syrup, Sugar syrup, Polyvinyl Pyrrolidone, Gelatin, Tragacanth & Methyl cellulose.	Used to increase adhesion in particles.
5	Colouring agents	Water soluble and lake dyes, FD&C colours, Orange colour base & red colour cubes, etc.	To give aesthetic appearance to candy.
6	Flavouring agents	Menthol, Spearmint, Cherry flavour, Eucalyptus oil.	Impart a good taste and increase acceptability.
7	Whipping agent	Milk protein, Egg albumin, Gelatin, Xanthan gum, Starch, Pectin, Alginate & carrageenan.	Used as a base for toffee like confection.
8	Humectants	Glycerine, Propylene glycol & Sorbitol.	Retain the moisture or softness in candies during its shelf life.

**List of flavouring agents :**<sup>[9]</sup>

Salt	Butterscotch, Maple, Nutty, Buttery
Bitter	Spice wild cherry, Licorice, Chocolate, Mint, Grape fruit, Coffee, Cherry, Peach
Acrid	Raspberry, Orange, Lemon, Lime, Vanilla.
Sour	Raspberry, Fruits, Berries, Acacia.
Sweet	Peppermint, Anise, Wintergreen.
Metallic	Citrus berries, Mint, Grapes, Marshmallow.

**Procedure for preparation of medicated lozenges**<sup>[6,7]</sup>

Prepare mixture of sugar, corn syrup and water by heating.



Add active pharmaceutical ingredient in above mixture.



Add polymers, colouring agents and flavouring agents.



Pour mixture into mould of suitable size and shape.



After cooling demould the candies and seal or wrapped in polyethylene wrapping.

**Packaging :** They are hygroscopic in nature because of sugar bases hence it should be packed

individually in water resistant packaging material. The packaging should be neat and aesthetic.

**Storage :** Avoid direct contact with sunlight. Kept out of heat and children's. Either room temperature or refrigerator temperature is required depends on medicines and adjuvant base.

**Application :**

- i. Local as well as systemic treatment is possible.
- ii. Many of oral disease is treated and relieved by a well-accepted route.
- iii. Also useful in systemic distribution of medication in smoking cessation and pain relief.

**Marketed product :**

- i. VICKS<sup>®</sup>
- ii. THERAZINC<sup>®</sup>
- iii. STREPSILS<sup>®</sup>
- iv. SUCRETS<sup>®</sup>

## II. CONCLUSION :

Lozenges are economic preparations has great demand in paediatrics patients. It has a bright future as a novel system of drug administration because they give action locally as well as systematically. It has a advantages like patient compliance, convince and efficient treatment with low dose, quick onset of action also reducing dosing frequency. Lozenges get a important position in pharmacy and will remain it as same in future.

## REFERENCES :

- [1]. OnkarGopale , Shraddha Jethawa, SuvarnaShelke. Medicated Lozenges: A Review. Asian Journal of Pharmaceutical Research and Development.2022;10(2):129-134.
- [2]. Suchitrapundir, AbhayMurariLalVerma. Review on Lozenges. Journal der pharmazieforschung.2014.2(1):1-10.
- [3]. Sunitha Reddy M, TejashriRagabhoina. Lozenges Formulation and Evaluation: A Review. International Journal of Pharmaceutical Research and Applications.2021,pp:678-684.
- [4]. Pothu R., Rao Y. Lozenges Formulation and Evaluation. International Journal of Advance in Pharmaceutics. Research. 2014;5(5):290-298.
- [5]. Maheshwari R., Jain V., Ansari R., Mahajan S.C., Joshi G. A Review on Lozenges. British Biomedical Bulletin. 2013;1(1):35-43.
- [6]. PattanayakD, Das S. Formulation development and optimization of medicated Lozenges for paediatricuse. Int J Pharm Res. 2012;3(1):138-140.
- [7]. H.A. Shojaei. Development of Medicated Lozenges. J Pharm Sci. 1998;1(1):15-30.
- [8]. Michaud J. Pharmaceutical Confectionery. Pharma ChemPharmaceu. 2002: 24-27.
- [9]. Abhijeet Sunil Kukde, Varsha M. A REVIEW STUDY ON -MEDICATED LOZENGES AS AN EFFECTIVE DOSAGE FORM.WJPPS. April 2020.vol9, Issue 5,66-682.