MEDICATED LOZENGES: A REVIEW

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ABSTRACT
Lozenges, or troches, are experiencing a renewed popularity as a means of delivering many different drug products. Lozenges have various advantages and disadvantages. Different types of lozenges and their methods of preparation along with ingredients used in their preparation are discussed. The selection criteria for flavoring agents and preservatives are mentioned, packing, quality control tests, storage, dispensing of lozenges have been reviewed in this. Examples of different lozenge formulations and different marketed products can be known from this review. Lozenges have bright future as a novel method of delivering drugs for local action and systemic effect. The acceptance for lozenges as a dosage form is high by adults and also more by children.

KEYWORDS: Lozenges, troches.

INTRODUCTION
Lozenges are solid preparations that contain one or more medicaments, usually in a flavored, sweetened base, that are intended to dissolve or disintegrate slowly in the mouth. They can be prepared by molding (gelatin and/or fused sucrose and sorbitol base) or by compression of sugar-based tablets. Molded lozenges are sometimes referred to as pastilles, whereas compressed lozenges may be referred to as troches. They are used for patients who cannot swallow solid oral dosage forms well as for medications designed to be released slowly to yield a constant level of drug in the oral cavity or to bathe the throat tissues in a solution of the drug. Lozenges historically have been used for the relief of minor sore throat pain and irritation and have been used extensively to deliver topical anesthetics and antibacterial.
CLASSIFICATION OF LOZENGES
Lozenges can be classified into various classes based on various methods like

A. According to site of action
   a. Local action
   b. Systemic action

B. According to texture and composition
   a. Compressed tablet lozenges
   b. Soft lozenges
   c. Hard lozenges

ADVANTAGES
1. No disintegration
2. Slower dissolution rate
3. Pleasant taste
4. Organoleptic properties like color, smoothness
5. Slow release of medicament

DISADVANTAGES
1. The lozenges dosage form is that it mistakenly could be used by childrens.
2. A hard candy lozenges is the high temperature required for their preparation.
3. Hard lozenges become grainy.

RAW MATERIALS
1. Hard candy lozenges
   a. Sugar: Dextrose, sucrose, corn syrup,
   b. Acidulants: Citric acid, Fumaric acid, Tartaric acid
   c. Colourants: Dyes Organic colourants
   d. Medicaments: Local anesthetics

2. Compressed tablets
   a. Tablet vehicle: Dextrose, Royal T, Sugae tab, Sorbitol, Manitol
   b. Binders: Acacia, Corn syrup, Sugar syrup, Gelatin, Traganth
   c. Colours: Dyes, Lakolene dyes.
SHAPES OF LOZENGES
a. Flat
b. Circular
c. Bioconvex
d. Cylindrical

FORMULATION OF LOZENGES
Lozenges are formulated in such a way that they are stable, provide a good medium for administration of drug. The ingredients which are used for formulation of Lozenges are as follows.

Criteria for preparation of medical lozenges
a. Selection of drug candidate
b. Selection of drug carrier.

EVALUATION OF MEDICATED LOZENGES
A. Quality control
(1) Candy base- It has to be check for following parameters-Corn syrup, sugar delivery gears, Temperature, steam pressure and cooking speed of precookers and temperature, steam pressure, cooking speed and vacuum of candy base cookers.

(2) Moisture analysis
a) Gravimetric method- 1g of sample is placed in vacuum oven at 60-70oC for 12-16hrs. After specified period of time, weigh the sample and moisture content is calculated by subtraction of final weight from initial weight.

Moisture Content =Initial weight – final weight
(3) Salvage solutions- Determined using a refractometer.
(4) Forming checks- Involves a check on candy rope diameter.

(B) Physical and Chemical Testing
(1) Diameter and thickness- Diameter of the lollipop is important for uniformity of lozenges size. It can be measured using Vernier Callipers’. The extent to which the diameter of the lozenges deviated from ± 5% of the standard value.
(2) Hardness- The resistance of lozenges to shipping or breakage under conditions of storage, transportation and handling before usage depends on its hardness. The hardness of lollipops can be measured by using Monsanto hardness tester. The hardness was measured in terms of kg/cm².

(3) Weight Variation- The USP weight variation test is done by weighing 20 lozenges individually, calculating the average weight and comparing the individual weights to the average.

(4) Drug excipients interaction studies- Determined by FTIR.
(5) Friability - Determined by Roche Friabilator operated at 25rpm for 4min.
(6) In-vitro drug release- This is carried out in USP II paddle type dissolution apparatus.
(7) Drug content- Appropriate number of lollipop are crushed and dissolved in an appropriate solvent and the absorbance of the solution.

(C) Microbial check
In this, the presence of any bacterial, mold or spore contamination is checked in raw materials, finished products, machinery, cooling tunnels, environmental conditions and storage drums.

Laboratory microbial testing should include the following counts:
- Total plate
- Total coliform
- Yeast and mold
- E.coli
- Staphylococcus
- Salmonella

(D) Stability testing
(1) Lozenges are subjected to stability testing under following conditions-
- 1-2 months at 60°C
- 3-6 months at 45°C
- 9-12 months at 37°C
- 36-60 months at 25°C and 4°C.
(2) Stability testing of product in package

Lozenges in their final packs are subjected to following conditions for stability testing:

- $25^\circ\text{C}$ at $80\%\text{RH}$ for 6-12 months
- $37^\circ\text{C}$ at $80\%\text{RH}$ for 3 months
- $25^\circ\text{C}$ at $70\%\text{RH}$ for 6-12 months.

PACKAGING

Hard candies are hygroscopic and usually prone to absorption of atmospheric moisture. Consideration must include the hygroscopic nature of the candy base, storage conditions of the lozenges, length of time are stored and the potential for drug interaction. These products should be stored in light containers to prevent drying. This is especially true of the chewable lozenges that may dry out excessively and become difficult to chew. It is best to slip this unit into a properly labelled, sealable plastic bags.

STORAGE

These preparations should be stored away from heat and out of the reach of children. They should be protected from extremes of humidity. Depending on the storage requirement of both the drug and base, either room temperature or refrigerated temperature is usually indicated.

CONCLUSION

The formulation of lozenges is an easy and time-saving process. It is a formulation which is more organoleptically accepted particularly by the pediatrics patients. Medicated Lozenges will be ideal dosage forms for pediatric patients. These will have additional advantages of patient compliance, convenience and comfort for efficient treatment including low dose, immediate onset of action, reduced dosage regimen and economic. This will offer better innovative dosage form. Lozenges enjoy an important position in pharmacy and will continue to remain at the same in future.

REFERENCE


