WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 7.523
Volume 6, Issue 3, 399-405. Review Article ISSN 2277– 7105

REVIEW OF MEDICATED LOLLIPOPS

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Article Received on
02 Jan. 2017,
Revised on 23 Jan. 2017,
Accepted on 13 Feb. 2017
DOI: 10.20959/wjpr20173-7968

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ABSTRACT

The administration of drugs through oral route is the most common and the easiest way of administering a drug. However, pediatric, geriatric and bedridden patient shows inconvenience swallowing conventional tablets or capsules due to difficulties in swallowing with lesser amounts of water with the medication, unable to tolerate the taste of many drugs when formulated as liquid dosage forms, resulting in poor patient compliance. The medicated lollipops are flavored medicated dosage forms intended to be sucked and hold in the mouth or pharynx. These preparations are commonly used for the purpose of local effect or systemic effect. Advantages of the medicated lollipops as dosage forms include increase in bioavailability, reduction in gastric irritation, bypass of first pass metabolism and increase in onset of action. New drug design to this area always benefit for the patient, physician and drug industry. Medicated lollipops are prepared heating and congealing method. A medicated lollipop has drawn attention to the researchers as potential drug delivery system and it could be a commercial success in near future.

KEYWORDS: Medicated lollipops, heating and congealing method, category of drugs used, evaluation tests.

INTRODUCTION

In oral drug delivery, there are many scientific challenges that could be studied for years to come and breakthrough technologies are required to generate novel dosage forms raising drug delivery to higher level. This article examines several aspects in oral drug delivery requiring implementation of novel ideas to improve oral drug delivery system.

Oral controlled release drug delivery is a drug delivery system that provides the continuous oral delivery of predetermined period throughout the course of GI transit and also the system that target the delivery of a drug to a specific region with in the GI tract for either a local (or) systemic action. All the pharmaceutical products formulated for systemic delivery via the oral route of administration, irrespective of the mode of delivery (immediate, sustained (or) controlled release) and the design of dosage form (either solid, dispersion (or) liquid) must be developed with in the intrinsic characteristics of GI physiology. In recent years scientific and technological advancements have been made in the research and development of rate-controlled oral drug delivery systems by overcoming physiological adversities such as short gastric residence time (GRT) and unpredictable gastric emptying times (GRT). Several approaches are currently floating drug delivery system (FDDS) also known as hydro dynamically balanced system (HBS), swelling and expanding system, polymeric bio adhesive systems and modified-shape systems, high-density systems and other delayed gastric emptying devices. To design the oral controlled release tablet to increase the residence time of the drug into the stomach and release for extended period of time in order to, increase bioavailability of the drug, reduce the dosing frequency and improve patient compliance.

LOLLIPOPS

A small, medicated candy intended to be dissolved slowly in the mouth to lubricant and so that irritated tissues of the throat. A small flavored tablet made sugar (or) syrup and often medicated. A Small medicinal tablet originally in the shape of lollipops, taken for sore throat and dissolved in the mouth.

Lollipops are large sugar boiled confectionary of various flavors attached to a plastic stick which can be consumed over a long period of time through licking. The plastic stick is used to hold the confection together.

Lollipops are the dosage forms that dissolve slowly in the mouth (or) that can be easily swallowed are gaining in popularity, especially among pediatric patients.

Lollipops are solid unit dosage form of medicament which is meant to be dissolved in mouth (or) pharynx. Development of lollipops dates back to 20 thcentury and is still in commercial production. Most of the lollipops preparations are available as over the counter medications. Lollipops provide a palatable means of dosage forms administration and enjoy its position in

pharmaceutical market owing to its several advantages but it suffers from certain disadvantages too.

The dosage forms can be adopted for local as well as systemic therapy and a wide range of actives can be incorporated in them. Lollipops are solid preparation that is intended to dissolve (or) disintegrate slowly in the mouth. They contain one (or) more medicament usually in a flavored, sweetened base. Lollipops are most often used for localized effects in the mouth. They can also be used for systemic effects if the drug is well absorbed through the buccal lining (or) is swallowed newer drugs.

ADVANTAGES OF MEDICATED LOLLIPOPS

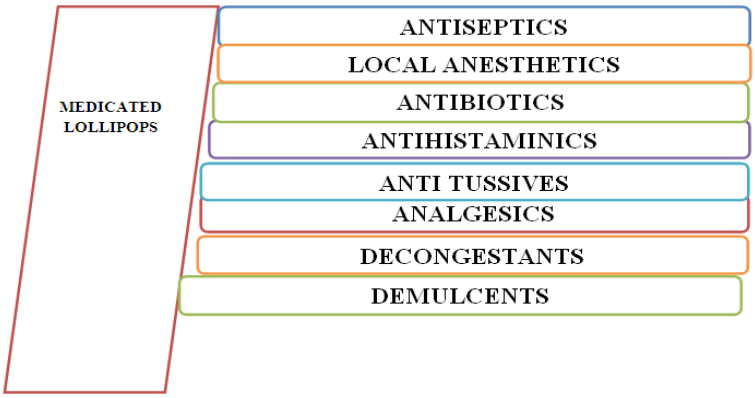
- Having formulas that are easy to change and can be patient specific.
- Keeping the drugs in contact with the oral cavity for an extended period of time.
- It has a pleasant taste and it extends the time that a quantity of drug remains in the oral cavity to elicit a therapeutic effect also, pharmacist can prepare lollipops extemporaneously with minimal equipment and time.
- Lollipops can be given to those patients who have difficulty in swallowing.
- It extends the time of drug in the oral cavity to elicit a specific effect.
- Easy to prepare with minimum amount of equipment and time
- Do not require water intake for administration. Technique is non-invasive, as is the case with parenteral.

DISADVANTAGES OF MEDICATED LOLLIPOPS

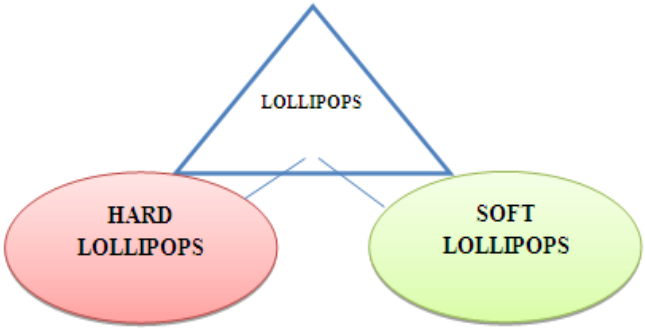
- Heat labile drugs cannot be used in this formulation because of the high temperatures required for preparation.
- Drugs having minimum bitter taste are suitable.
- Heat stable drugs are suitable.

MEDICAMENTS REQUIRED FOR PREPARATION OF MEDICATED LOLLIPOPS

Drugs candidates which can be incorporated in lollipops belong to one of the following categories.



TYPES OF LOLLIPOPS

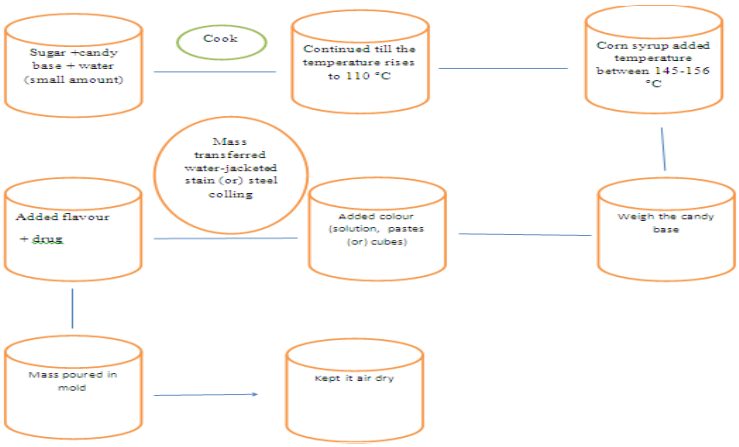


HARD LOLLIPOPS

Hard lollipops might be considered solid syrups of sugars. These dosage forms are made by heating sugars and other ingredients together and then pouring the mixture into a mold. Hard lollipops are similar to hard candy. In fact, many hard lollipops formulas are modifications of hard candy formulas. The dosage form needs low moisture content. So water is evaporated off by boiling the sugar mixture during the compound process.

Hard candy lollipops are mixtures of sugar and other carbohydrates in an amorphous (non-crystalline) (or) glassy condition. These lollipops can be considered solid syrups of sugars and usually have a moisture content of 0.5%-1.5%. Hard lollipops should not disintegrate but instead provide a slow, uniform dissolution (or) erosion over 30 minutes.

MANUFACTURING OF HARD LOLLIPOPS



SOFT LOLLIPOPS

Soft lollipops have become popular because of ease with they can be extemporaneously prepared and their applicability to a wide variety of drugs. The base usually consists of a mixture of various PEGs, acacia (or) similar materials glycerol gelatin (or) an acacia: sucrose base. These lollipops may be coloured and flavored and they can be either slowly dissolved in the mouth (or) chewed, depending on the intended effect of the incorporated drug.

METHOD OF PREPARATION

Lollipops are prepared by heating and congealing technique.

HEATING AND CONGEALING TECHNIQUE

1. Syrupy base to be prepared by dissolving the required amount of sugar by heating at 110^0C for about 90 mints
2. Addition of base syrup by raising the temperature to 160^0C.
3. Cooling to obtain the plastic mass.
4. Addition of drug, polymer, colour, flavour with mixing.
5. Size roping of the materials in a moving roller after drying.
6. Wrapping with polyethylene wraps.

Molds used in the preparation of lozenges/troches must be calibrated to determine the weight of the lozenge using the particular base of interest. This can be done as follows.

1. Prepare the lozenge mold and confirm that the cavities are clean and dry.
2. Obtain and melt sufficient lozenge base to fill 6 to 12 molds.
3. Pour the molds, cool and trim, if necessary.

4. Remove the lozenges and weigh.
5. Divide the total weight by the number of blank lozenges prepared to obtain the average weight of each lozenge for this type of particular base.

EVALUATION OF PHYSICAL PROPERITIES OF LOLLIPOPS

The formulated lozenges and tablets were evaluated for the following parameters.

1. THICKNESS

The thickness and diameter of the formulated lollipops were measured by using Vernier calipers.

2. WEIGHT VARIATION

The formulated lollipops were tested for weight uniformity. 20 tablets were collectively and individually. From the collective weight, average weight was calculated. Each lollipops weight was then compared with average weight to ascertain whether it is within permissible limits or not.

$$\% \text{ Weight Variation} = \frac{\text{Average weight-Individual weight}}{\text{Average weight}} \times 100$$

3. HARDNESS

The lollipops crushing strength, which is the force required to break the lollipops by compression in the diametric direction was measured in triplicate using Pfizer tablet hardness tester.

4. FRIABILITY

The Roche friability test apparatus was used to determine the friability of the lollipops. 5 pre weighed lollipops were placed in the apparatus, which was subjected to 100 revolutions. Then the lollipops were reweighed. The percentage friability calculated was using the formula.

$$\% \text{ Friability} = \frac{\text{Initial weight- Final weight}}{\text{Initial weight}} \times 100$$

DRUG CONTENT

Lollipops were weighed and powdered. The quantity of powder equivalent to 100 mg of was dissolved in buffer diluted to 100ml with buffer then the solution was filtered and suitably diluted. The drug content was estimated spectrometrically.

IN VITRO DISSOLUTION STUDIES

Dissolution rate was studied using USP II paddle dissolution apparatus, in 900ml of 37±0.5°at 100 rpm. Aliquot of dissolution medium was with**d**rawn at regular time intervals and the same volume of pre-warmed (37±0.5°) fresh dissolution medium was replaced. The samples were filtered and drug content of in each sample was analyzed after suitable Dilution by Shimadzu UV-spectrophotometer.

REFERENCES

1. Devi V K (2006), "Orodispersible Fluconazole Tablets – Preparation and Evaluation", *Indian Drugs*, July, 23(7): 548-552.
2. Firriolo John F (1994), "Oral Candidiasis, History, Classification and Clinical Presentation, Oral Surg. Med. Oral Pathol", *Louisville*, 78(2): 189-193.
3. Gibbs K P and Portlock J C (1999), *Clinical Pharmacy and Therapeutics*, 2nd Edition, Published Walker Edwards, Scotland, pp. 347-367.
4. Herbert A Lieberman, Leon Lachman (1991), "Pharmaceutical Dosage Forms – Tablet Series, "Medicated Lozenges" Marcel Dekker Inc. New York and Basel, 2nd Edition, 1: 339-467.
5. Harsh Mohan (2000), *Text Book of Pathology – The Oral Cavity and Salivary Glands*, 4th Edition, pp. 494-496, Jaypee Brothers, Medical Publishers (P) Ltd., New Delhi.
6. Jain N K (2005), Controlled and Novel Drug Delivery, Chapter 16-Mucoadhesive Drug Delivery, CBS Publishers and Distributors, New Delhi, pp. 353-376.
7. Jelvehgari Mitra (2006), "Mucoadhesive and Drug Release properties of Benzocaine Gel", *Iranian Journal of Pharmaceutical Science*, Autumn, 2(4): 184-194.
8. Shojaei H A (1998), "Buccal Mucosa as a Route for Systemic Drug Delivery: A Review", *Journal of Pharmaceutical Sciences*, 1(1): 15-30.
9. Rawlins E A (1995), "Bentley's Text Book of Pharmaceutics", Chapter-9 *Rheology*, Bailliere Tindall, London, 8th Edition, pp. 123-39.
10. Ross and Wilson (2001), *Anatomy and Physiology in Health and Illness – Diseases of the Mouth* 9th Edition, p. 319 Churchill Livingstone.