



## A RESEARCH ON MEDICATED LOLLIPOP

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### ❖ ABSTRACT

Lollipops as a drug delivery form are a unique way to administer flavored medications that are often used for local effects in the mouth or throat. These lollipops, made by heating and solidifying a sucrose base, offer several advantages, including enhanced bioavailability, reduced dosage, minimized intestinal absorption, and avoidance of the metabolic process. Such characteristics make them particularly useful for increasing patient compliance and acceptance. Physical properties like thickness (12-13.2 mm) and hardness (10-11.5 kg/cm<sup>2</sup>) are critical for the quality of lollipops. In vitro drug release studies have shown that formulations such as L3, L6, and L10 provide efficient drug release within 30 minutes, with L3 being the most effective overall according to comprehensive testing. Additionally, stability studies indicated no significant changes in these formulations over a period of 90 days. These findings suggest that lollipops could be a promising method for delivering medications, particularly for mucolytic therapy in pediatric patients.

❖ **KEYWORDS:** *Chloram*, Lollipops, Antiallergy, Mucolytic and Mucokinetic.

### ❖ INTRODUCTION

Lollipops are defined as a quantity of flavored medicine, usually containing one or more substances in sugar, intended to be inhaled and stored in the mouth or pharynx.<sup>[1]</sup> Lollipops are often used to induce local effects or infections of the gastric mucosa. The advantages of lollipops as a dosage form include increased bioavailability, reduced dosage, reduced intestinal absorption and bypass of primary metabolism.<sup>[2]</sup> Lollipop is designed to improve patient compliance, recognition, handling, and more. The need for more patient compliance data has increased over the past two decades. That's why the demand for its technology has tripled every year. Because the development costs of new drugs are so high, pharmaceutical companies are now focusing on developing new drugs for existing drugs to increase efficacy and bioavailability while reducing drug frequency to reduce side effects. The advantage of this formula is that it is easy to apply to children and elderly patients and the drug can be absorbed orally. Antibiotics that may be put in lollipops fall into one of these categories: antivirals, antitussives, decongestants, painkillers, cough suppressants, and sore throats or word-of-mouth.<sup>[3]</sup> Medicine lollipops are sweets containing medicine that dissolves slowly in the mouth, usually in syrup or lozenge form. This is a simple and quick way to administer medication, especially for children or people

who have difficulty swallowing tablets or capsules. Lollipops are often used for a variety of medical purposes, such as reducing pain, stopping coughs, or treating sore throat or mouth ulcers. They may have different types of medications, such as analgesics (painkillers) such as acetaminophen or ibuprofen, antitussives (cough suppressants) such as dextromethorphan, or local anesthetics such as benzene, Zocaine, for sore throat or mouth pain. Lollipop dosage and instructions should be followed carefully by a qualified doctor. It is important to remember that lollipops, like other medications, can have side effects and interact with other medications or diseases.

### ❖ AIM AND OBJECTIVES

Chlorpheniramine Maleate Medical Lollipops are designed to relieve symptoms such as sneezing, coughing or runny nose, itching and watery eyes. Chlorpheniramine maleate is an antihistamine that works by blocking the effects of histamine, a substance released by the body during an allergic reaction. Chlorpheniramine maleate medication in lollipop form is generally used in pediatric patients or people who have difficulty swallowing tablets or capsules. Lollipops are often flavored and designed to be sucked; It allows the medicine to dissolve slowly in the mouth and be absorbed from both sides of the mouth and throat. The purpose of using Chlorpheniramine Maleate Medical

Lollipop is to provide easy and effective relief of allergic symptoms, especially when other types of medication are not suitable or not recommended. Always follow the instructions given by your doctor or written on the packaging and consult your doctor before using any medicine, including chlorpheniramine maleate medical lollipops, especially for children, pregnant or nursing mothers, or those with certain diseases.

#### ❖ OBJECTIVE OF CHLORPHENIRAMINE MALEATE LOLLIPOP

Chlorpheniramine maleate is an antihistamine commonly, used to treat allergy symptoms.

- 1) Medicine lollipops are designed to deliver specific medicines in a convenient format.
- 2) Create medicine lollipops to make taking medicine easier.<sup>[4]</sup>
- 3) Lollipops can be injected according to appropriate medical instructions.
- 4) Lollipops are usually made to be delicious and easy to eat.<sup>[5,6]</sup>
- 5) Medicine lollipops are specially designed for children or people with swallowing difficulties.
- 6) Lollipop can be carried in a purse or purse, making it easy to carry.
- 7) The unique shape and appearance of lollipops helps create recognition and differentiation among products in the market.

❖ **HISTORY OF LOLLIPOP:** The concept of a consumable lollipop's is so basic that it appears that lollipops have been conceived and renewed repeatedly. The origins of lollipops can be traced least to the era of the Middle Ages, during which individuals would chew sweets with sticks or their hands. The origins of the contemporary lollipop are unknown, yet in the beginning of the twentieth century, various American businesses disputed that they owned it. As stated in the text of *Deeper Views: Mysterious Small Things in the Universe*, George Smith, a resident of New Haven, Connecticut, was the person who developed the enormous sweets in 1908. Later a horse. In 1931, a lollipop patent was established. The term "lollipop" was first used by British lexicographer Francis-Grosse; in, 1796.

#### ❖ ADVANTAGES OF MEDICATED LOLLIPOPS

- 1) Easy to carry.
- 2) It is easy to swallow.
- 3) Paper is easy to eat.
- 4) It has bioavailability.
- 5) There is no need to drink water.
- 6) Lollipops are easy to prepare with minimal ingredients and time.
- 7) Patients with difficulty swallowing can be given lollipop.
- 8) The model is easy to change and can be adjusted for individual patients.

- 9) Bypassing the digestive system rice and liver cooperation, increasing oral intake. Bioavailability of the drug is limited by Before anything else, the liver's pathway passes through fermentation.
- 10) The medicine doesn't get broken down either pH levels or intestinal enzymes in the mid-GI region.
- 11) Treat pain, reduce cough,
- 12) Treat throat or mouth ulcers.
- 13) Prevent allergies, mucus dissolution and mucus increase.

#### ❖ DISADVANTAGES OF MEDICATED LOLLIPOPS

- 1) Since the formulation must be hot, heat-sensitive drugs cannot be used in this formulation.
- 2) Medicines with the least bitter taste are required.
- 3) They can cause fatigue and dysfunction.
- 4) Overdose may cause symptoms such as nervousness, confusion, seizures and coma.
- 5) Chlorpheniramine maleate may interact with other medications such as tranquilizers, tranquilizers and antidepressants.

#### ❖ CLASSIFICATION OF LOLLIPOPS

Lollipops can be divided into several groups according to different methods as follows:

##### (A) By function

- 1) Local action: Preservatives, reducers Congestant.
- 2) Effects on the body: Vitamin, nicotine.

##### (B) Classification by Texture and Ingredients

- 1) Chewable or caramel medicinal lollipops
- 2) Compressed tablet lollipops
- 3) Soft lollipops
- 4) Hard lollipop's

#### ❖ TYPES OF MEDICATED LOLLIPOPS

1. **Hard Lollipops:** You might conceive of tough lollipops as liquid ice. Sugar is cooked with additional ingredients to create the remedy, which then goes into a mould. Hardened candy while hard lollipops are similar. Many recipes involving hard lollipops employ redesigned hard candies. This dish should contain less moisture. Warming the mixture of sugar enables the fluid to dissipate during the course of compounding. Tough candies the lollipops are composed of a variety of carbohydrates and unstructured (or shattered) sugar.<sup>[6]</sup> The aforementioned lollipops, with moisture content ranging from 0.45% to 1.8%, are known into liquid snow. Hard lollipops ought to melt over time and worn consistently (or not) in around half an hour of consumption.
2. **Soft Lollipops:** Lollipops contain health-related data regarding drug inhalation and are stored in the mouth cavities or The roof of the mouth These prescriptions often contain one or more medications in a sugar, sweetened base. Buccal mucosa is often

used with lollipops to provide local or systemic effects. There are many benefits to using lollipops as a dosage form, including increased bioavailability, smaller meals, reduced stomach upset, and primary metabolic bypass. The purpose of the lollipop is to improve patient acceptance, compliance, and transportation, among other things. The need for more patient compliance data has increased over the past 20 years. That's why the demand for their technology is greater than ever. Pharmaceutical companies are now focusing on existing drug sites because building new ones is too expensive.

#### ❖ Mechanism of Action of Medical Lollipops

Thanks to our lollipop delivery method, the absorption of the drug from the oral mucosa is faster than the drug being swallowed and absorbed from the digestive tract. You can easily control drug intake by eating lollipops until the desired effect is achieved. The pleasure of eating.<sup>[7]</sup> They also do not require water, meaning they can be carried anywhere and anytime. Lollipops are sweets or candies that contain active ingredients (usually medications) and are designed to melt slowly in the mouth. The mechanism of action of drug lollipops depends on the specific drug or substance contained in the lollipop.<sup>[8]</sup>

#### ❖ Here are some mechanisms of action

- 1. Local Effect:** Numerous candies comprise chemicals designed to work locally within the windpipe or mouths. Lollipops have incorporated anaesthetics, such as nicotine or the painkiller lid help relax the muscles in the mouth and throat, easing sore throats and various oral disorders.
- 2. Systemic Absorption:** Some lollipops contain chemicals designed to be absorbed through the mouth or t

hroat and enter the-body, causing systemic effects. For example, lollipop pills contain:

- 1) Opioids,
- 2) Cannabinoids,

#### ➤ Other medications are also available to prevent cough or other illnesses

- a) Slow Release:** The lollipop form offers a gradual and regulated release of the medication because it melts in, the mouth allowing the ingredients to be taken as a mouthful for a long time. Mucous membrane of the mouth and throat. This slow release helps prolong the duration of action of the drug and provides support.
- b) Ease of administration:** Lollipops are an easy way to administer medication, especially in situations where swallowing tablets or liquids may be difficult, such as in children, the elderly, or patients with certain diseases. The lollipop format allows for easy administration and a pleasant taste, which may make the medication process more pleasant for some patients. It is important to note that the specific process of making the lollipop medicine depends on the ingredients or medicine it contains and the instructions of the sources that manufacturers or providers must follow in order to use it effectively. Before using any medication, including lollipop, always consult a physician to ensure that the medication is appropriate for your specific needs and medical condition.<sup>[10]</sup>

**Table 1: Types of Excipient Use In Medicated Lollipop And Their Role.**

| Sr. No. | Ingredients                      | Example  | Role/Function   |
|---------|----------------------------------|--|---|
| 1.      | Candy-based, sugar-free vehicles | Ingredients include maltitol, dextrose, sucrose, maltose, lactose, mannitol, sorbitol, and PEG- 600/800. | They are used to make desserts and to mask desserts.                        |
| 2.      | Lubricants                       | Vegetable oils and fats such as PEG, calcium, magnesium, and stearic acid.                               | These are used to prevent sugar from remaining on your teeth                |
| 3.      | Binders                          | corn syrup, sugar syrup, gelatine, methylcellulose, tragacanth and polyvinylpyrrolidone.                 | These are used as holders for objects.                                      |
| 4.      | Colouring- agent                 | Orange coloured pastered colour cubes, FD and colourants, water soluble and lakolene dyes, etc.          | They would produce stunning beauty. paper dosage's sensory characteristics. |
| 5.      | Flavourings; agent               | Ingredients include menthol, eucalyptus oil, spearmint, cherry taste, among others.                      | You are meant to taste these.   |
| 6.      | Whipping-agent                   | Egg albumin, milk protein, gelatine, xanthan gum, starch, pectin, algin, and carrageenan.                | They are utilised in candy confections.                                     |
| 7.      | Humectants                       | Trimethylpropylene glycol, sorbitol, and glycerine.  | They enhance the digestive tract.   |

### ❖ PRE-FORMULATION STUDIES OF DRUGS<sup>[11]</sup>

Initial formulation is a manner of screening a drug in addition to or without additives utilising methods that are both chemical and physical. Preformulation studies constitute the very first phase of the pharmaceutical manufacturing process. The purpose of this initiative is to determine the appropriate thermodynamic properties of innovative drugs. Assess, for-compliance, with-different, excipients.

### ❖ CHARACTERIZATION OF CHLORPHENIRAMINE MALEATE

- a) **Organoleptic Properties:** Chlorpheniramine maleate is a transparent, white, unpleasant powdered or material with no odour and a pH level of 5.4-5 (1% aquatic dilution) when in water liquid.
- b) **Description:** A portion of the medication (chlorpheniramine maleate) had been examined for its entire body and powdery.<sup>[12]</sup>

c) **Melting point:** The point at which it melted of chlorpheniramine maleate was obtained with the free capillaries the approach. The freezing point of chlorpheniramine maleate has been estimated to be within 130 & 135 degrees Celsius, but this can vary significantly subject to configuration and experimentation.<sup>[13]</sup>

d) **Solubility Characteristics:** Examination of the following substances: ethyl formate, among other butyl acetate, benzene or 1-propanol which, the use of 1-but and the alcohol utilising lasers that operate at ambient solution temperatures ranging between 283A and 333A. Chlorpheniramine maleate is soluble in solvent that is pure at higher temperatures in the following order: massive alcohol > heavier ester > benzene. The semiempirical algorithm was connected to the empirical saturation data.<sup>[14]</sup>

**Table 2: Formulation Table for Medicated Lollipop.**

| Ingredients In mg          | L0   | L1   | L2   | L3   | L4                   | L5   | L6   | L7   | L8   | L9   | L10  |
|----------------------------|------|------|------|------|----------------------|------|------|------|------|------|------|
| Chlorpheniramine Maleate   | 16   | 16   | 16   | 16   | 16                   | 16   | 16   | 16   | 16   | 16   | 16   |
| Maltitol                   | 3528 | 3495 | 3470 | 3445 | 3495                 | 3470 | 3445 | 3470 | 3445 | 3470 | 3445 |
| Dextrose                   | 1415 | 1415 | 1415 | 1415 | 1415                 | 1415 | 1415 | 1415 | 1415 | 1415 | 1415 |
| Citric acid                | 52   | 52   | 52   | 52   | 52                   | 52   | 52   | 52   | 52   | 52   | 52   |
| Methyl cellulose           | -    | 24   | 48   | 72   | -                    | -    | -    | -    | -    | -    | -    |
| Scmc                       | -    | -    | -    | -    | 24                   | 48   | 72   | -    | -    | -    | -    |
| Hpmc k100m                 | -    | -    | -    | -    | -                    | -    | -    | 48   | 72   | -    | -    |
| Hpmc-k4 m                  | -    | -    | -    | -    | -                    | -    | -    | -    | -    | 48   | 72   |
| Colouring-agent            |      |      |      |      | <i>Q. sufficient</i> |      |      |      |      |      |      |
| Flavouring-agent           |      |      |      |      | <i>Q. sufficient</i> |      |      |      |      |      |      |
| Purified* H <sub>2</sub> O |      |      |      |      | <i>Q. sufficient</i> |      |      |      |      |      |      |

### ❖ METHOD OF PREPARATION

**Syrup Maltitol Base:** Maltitol syrup is a sweetener often used as a substitute for sugar. It is an encapsulated sugar alcohol made from hydrogenated maltose obtained from corn, wheat or barley. Maltitol syrup is often used in sugar, free and reduced sugar products because it has fewer calories and a lower glycemic index than regular sugar.<sup>[15]</sup>

### ➤ THE METHOD OF PREPARATION OF MALTITOL SYRUP INVOLVES THE FOLLOWING STEPS

1) **Dissolve maltitol powder in water:** Add maltitol powder to hot water and stir until dissolved. The amount of maltitol powder and water used depends on the desired syrup concentration.

2) **Heat the mixture:** The maltitol and water mixture is heated to a temperature of around 120-130°C (248-266°F) to evaporate excess water and concentrate the syrup.

3) **Cool the syrup:** After reaching the desired consistency, cool the syrup to room temperature, package and store.

### ❖ PREPARATION OF MEDICATED LOLLIPOPS

- 1) Prepare 15 grams of medicine lollipop.
- 2) The method of achieving heat condensation process.<sup>[23]</sup>
- 3) Prepare the syrup base in a beaker, dissolve the amount of maltitol in water, heat and stir at 120-130°C for about 90 minutes.
- 4) Add glucose and continue stirring for 2 hours, increasing the temperature to 160 °C.
- 5) Transfer the product to a cold plate and reduce the temperature to 90°C until you get Plastic products.
- 6) Add chemicals, polymers, pigments, fragrances and mix the ingredients for 30 minutes.
- 7) Adjust the product of the string and roller movement, and then set the size to 5 grams.

- 8) Let the lollipop air dry for 2 hours. in the drying room. The prepared lollipops are closed and wrapped in polyethylene bags.<sup>[24]</sup>
- 9) A total of three groups of samples were prepared using lollipop: hydrophilic colloids, hydroxypropyl methylcellulose (HPMC) K4M and K100M, methylcellulose, sodium carboxymethylcellulose and those without added salt.

#### ❖ EVALUATION OF MEDICATED LOLLIPOP

##### ➤ Physical Parameters

**1. Hardness:** Show off the tablet's ability to stop material impact while being transported. The Monsanto hardness tester is used to determine the tablet's hardness. It is given in the unit kg/cm<sup>2</sup>. This sample's hardness value of 8–11 kg/cm<sup>2</sup> indicates good strength.

**2. Friability (F):** A Roche friability tester ought to be used for the friability test. Accurately weigh twenty tablets, then put them in a drum that spins at 26 rpm. The tablet is weighed after five minutes, and the proportion of tablet loss is ascertained. All formulas have friability values less than 1%, which suggests that they, have-good-lollipop-qualities.  $F = \frac{W_{\text{initial value}} - W_{\text{final value}}}{W_{\text{initial value}}} \times 100$ <sup>[25]</sup>

**3. Thickness and Diameter:** Thickness and distance across ought to be measured with a vernier caliper. determined by measuring the width and thickness of ten candies for each formula. Determine the extent to which each candy's thickness deviates by  $\pm 5\%$  from the average. The standard thickness of candies ought to be considered as 5-5.4 mm and all details appear the same thickness.

##### 4. Weight Variation

Check the lollipops randomly to make sure you've created an even lollipop. Weigh 20 lollipop recipes individually and calculate the average weight and percent weight change. The maximum number of lollipops that deviate from their mean weights by more than one percentage point is required. More than doubled its weight percentage. The total weight of the lollipop is now 1000 mg. So according to the USP the maximum variation allowed per lollipop is 10%. Average weight from 4.98 to 5.31.

##### 5. Drug Content

After soaking the lollipops in a 100-milliliter amount of purified water for thirty minutes, drain. Take 1ml of the above solution into a volumetric vial and dilute to 10ml (100µg/ml) and analyze spectrophotometrically at 224nm. The content of the drug should be the same in all formulations and should be between 94.85±0.39% and 97.33±1.15%.

##### 6. Moisture Content

In a mortar, the samples were measured and ground into powder. This allowed for the weighing of one gramme of the test to be placed in a the desiccator for a full day.<sup>[26]</sup>

Tests were weighed a day later. By deducting the candy's final weight from its initial weight, the dampness substance is determined. These candies can be considered fluid ice and more often than not have a dampness substance of 0.5% - 1.5%.

##### 7. Disintegration Test

Shredding studies were carried out using a crusher. Place a lollipop in each tube, transfer the assembly to a beaker containing Run the pH value 6.8 a buffered phosphate solution without a disc for half an hour. Take the product out of the fluid. When the lollipops come out, they will melt in your mouth within 1 to 10 minutes.

##### 8. Taste Masking Test

Initially, ten medical professionals were asked to swirl a normal quinine solution (20–160 mcg/mL) for 30 seconds in their mouths. and spit the configuration out. The suffering will be rated (review up to 5) by the volunteers. After 30 minutes, volunteers will be inquired to rate the taste of the same candy and compare the same sum. The standard proportion for 0.5% sedate candy taste veiling is 1/2 the measure.

##### 9. In Vitro Dissolution Studies

Using a 900 cc USP II paddle dissolving equipment at  $37 \pm 0.5^\circ$  and 100 rpm, dissociation was investigated. Sections of the medium that dissolves should be removed temporarily and replaced with an equal amount of fresh, pre-warmed (that is,  $37 \pm 0.5^\circ$ ) dissolving medium. After being suitably diluted and filtered, each sample has its chemical composition examined.<sup>[27]</sup>

#### ❖ CONCLUSION

- Preparing lollipops is a simple and time-saving method. Medicine lollipops may offer an attractive treatment option for pediatric patients.
- Oral application is the most preferred application method due to patient compliance, ease of application and flexibility
- Medicine lollipops are an ideal form for pediatric patients. This will provide better information.<sup>[28]</sup>
- Satisfied with the significant work in the, drugstore and won't change going forward, lollipops are a unique and convenient way to deliver medicine, especially to people who have difficulty swallowing pi-lls or prefer a more pleasant way to take pills.
- Traditional prescriptions have some limitations and are difficult to use in children and elderly patients with dysphagia, lollipops are very effective in this regard and can deliver effective medicine. space, exposure time, thus increasing bioavailability.<sup>[29]</sup>
- Advantages of drug lollipops include ease of use, mobility, and difficulty in detection; This makes them suitable for many patients, including children, the elderly, and people with certain diseases.<sup>[30]</sup>
- These lollipops often contain a variety of chemicals such as antibiotics, anti-nausea medications, and even vitamins that target specific ailments or symptoms.

- Advantages of medicine lollipops include ease of use, portability, not easy to detect, and suitability for many patients, including children, the elderly, and people with certain diseases.
- They are especially useful in treating pain or discomfort associated with dental procedures, nausea from chemotherapy, or other conditions for which conventional medicine may be difficult or inconvenient. Effective treatment that includes less drug use, rapid onset of action, reduced drug consumption and budget, i.e. lollipop, will be a suitable form for pediatric patients.<sup>[30]</sup>
- These will provide more useful and creative information.
- Health the lollipops will keep being crucial to the pharmaceuticals sector in the upcoming.<sup>[31]</sup>
- When discussing a certain medication in lollipops, it's critical to keep in mind that the drug's safety as well as effectiveness will vary depending on the particular medication and how it's used.
- It is essential to following the doctor's recommendations and never over the prescribed intake.

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