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RESEARCH ARTICLE

Formulation and Evaluation of Polyherbal Medicated Lollipop for Paediatrics

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ABSTRACT:

The goal of current work is to formulation and evaluation of medicinal lollipop for paediatrics. For paediatric patients, the traditional dosage forms-such as tablet, capsules, syrup, etc.-are inconvenient. Lollipops are characterised as medicinal dosage forms with flavours that are meant to be sucked and kept in the mouth or throat. These forms often contain one or more medications in a sweetend foundation. Due weather change and due to bronchial infection cough occurs in paediatric commonly and conventional dosage form is not suitable for paediatric. Most in children is caused by undifferentiated acute respiratory tract infections-a cough that does not conform to any clear diagnostic syndrome such as cough, whooping cough, pneumonia, or bronchiolitis. This medicated lollipop formulated with the help of Sitaphal powder, bamboo, pepper, cardamom, and cinnamon and prepared by heating and congealing method. This polyherbal lollipop prepared specially for diabetic children with the help of honey not by using sugar syrup base, because most of the lollipop prepared by using sugar syrup and it is inconvenient for diabetic children. Different evaluation parameter was performed like hardness, friability, weight variation and moisture content. Medicated lollipop passes all evaluation parameter.

KEYWORDS: Lollipop, Cough, Honey.

INTRODUCTION:

The term "Lollipops" or "Lozenges" refers to the flavoured, medicinal dosage forms that are meant to be sucked and retained in the pharynx or mouth and contain multiple active ingredients. Generally, medications are within the base that has been sweetened.

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like pills, capsules that are typically used orally. These formulations are the most often used for patient compliance and ease of drug administration. However, the treatment cannot be administered as is in oral traditional forms, be it tablet or capsule, for geriatric, paediatrics, or bedridden patients due to unappealing taste of the medication and difficulties administering and swallowing. To address this, a novel strategy the creation

Popsicles are commonly used to provide local or

systemic effects through the buccal mucosa. The

increase in bioavailability, decrease in dose size,

reduction in gastrointestinal discomfort, and bypass

initial metabolism are all benefits of the lollipop as a

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of Medicated lollipop has attracted a lot of interest.¹² Drugs absorbed through the buccal cavity are directly reached to the systemic circulation, avoiding the intestinal and hepatic first-pass metabolism, thus potentially enhance their extent of absorption. Consequently compared to other oral medication delivery methods it might be able to administer a lower amount in lollipop.¹⁴

Lollipops are present in solid dosage forms that include medicine in a base that has been sweetened and flavour added. They are designed to dissolve gradually in the mouth. Particularly sweetening, flavour, colouring, opacifiers, and stabilizing agent are found in lollipops. Lollipops are flavoured medication dosage that able to be mouthed or sucked. Pharynx that typically contains more than one medications in the sweetened base. Lollipops are meant to ease sign of oropharyngeal which may typically be brought on by local infections as well as for systemic effects if the medications are properly absorbed through the buccal mucosa or while it is eaten.²

Any region of the respiratory system and associated structured such as the middle ear, plural cavity and paranasal sinuses, can become infected with an acute respiratory infection. It may cause inflammation of respiratory tract anywhere from nose to alveoli. The frequency of ARI declines with age, peaking in young children, particularly those under five.8 The most common symptoms of an upper respiratory tract infection(URTI) in both adults and children worldwide is an acute cough. It has a significant impact on the patient, their family and the medical system. As a natural reaction to airway irritation, coughing is essential for protecting and maintaining the potency of the airway. The two main purposes of coughing are to prevent food and liquids from entering the lower airway and to facilitate the elimination of materials whose amount. size, rheological properties exceed the mucociliary systems transport capacity. Coughing can be reflexive or nonreflexive such as behavioural and it can be happened freely or in response to a stimulus.^{3,9}

Plants are a significant source of medicines that are beneficial to human health. Chronic and infectious disorders have traditionally been treated using bioactive chemicals and their mixtures. because secondary metabolities from plants are abundant and many of them have several bioactive qualities, there is a constant need for plant-based medicines. Over 80% of people on the planet use traditional medicine, according to a WHO assessment on a primary health care requirements.¹⁵

This polyherbal medicated lollipop prepared with the help of Sitaphal powder, bamboo, pepper, Elettaria cardamom, and cinnamon. All these ingredients in each of these materials is combined in the ideal ratio before being dried and powdered to create a lollipop. Sitaphal powder is key ingredient. Sitaphal powder for the treatment of digestive problems, allergy disorders, and respiratory illnesses, ayurvedic therapy is highly successful. The primary purposes are to boost immunity, improve pulmonary performance, and restore lung capacity. Sitaphal is a fantastic immunomodulator. Sitaphal powder can be used with honey for the treatment of dry cough. It helps to balance Kapha, the main cause of cough-related problems. It also reduces dryness in the throat and thus provides relief from dry cough. The shoots are thought to help in digestion, promotes peristaltic movement and is helpful in treating constipation.¹⁵ While cardamom is rich in antioxidants that guard against free radical damage and has potent anti-inflammatory qualities, pepper and Cinnamomum zeylanicum act as bio-enhancers. Cardamom increases glutathione levels, which is one of its powerful antioxidant properties. Cardamom also use as flavouring agent. All these components are frequently used in traditional medicine to treat respiratory conditions like pneumonia, bronchitis and TB as well as a fever associated with the flu and chest congestion. The phlegm is released, and respiratory disorders are treated by the anti-inflammatory quality. Moreover it is highly effective in reliving coughing. Bark powder has strong antitubercular properties and is very helpful for cough and colds. This medicated lollipop specially prepared by using honey, because honey increases insulin secreation and decrease in waist measurement and this beneficial to diabetic children.¹⁰ Honey having multiple medicinal properties like it cure ophthalmic diseases, gastric disease, wound infection, dental health, diabetes mellitus, cancer, asthma, cardiovascular diseases.¹⁰ Since 8000 years back, honey the only animal source sweetener. It is containing antioxidants, Vitamin C, pinocembrin, chrysin, formic acid, pinobanksin.¹³

Natural Herbs used in Cough⁷:

- 1. Ajwain
- 2. Kapoor
- 3.Tulsi
- 4. Malabar nuts
- 5. Cinnamomum zeylanicum
- 6. Cardamomum
- 7. Ephedra distachya

Types of Medicated lollipop:^{5,11} 1. Hard Candy Lollipop:

Hard candy lollipops are amorphous (noncrystalline) or glassy combinations of sugar and other carbohydrates. They can also be thought of as solidified sugar treacle. Troche should weigh 1.54.5 g and have a moisture level of 0.5% to 1.5%, respectively. These should erode slowly and uniformly over the course of 5 to 10 minutes; they shouldn't disintegrate. Temperature sensitive materials can't be included in them due to the high temperatures needed to prepare them.

2. Soft Candy Lollipop:

Soft lollipops have become well-known due to their simplicity in preparation and their adaptability to a different types of medications. The basis often contain a mixture of different PEG, Jerusalem thorn, or equivalent substances, glycerol, gelatin, or an acacia: sucrose base. Those lollipops can be shade and flavoured and depending on the intended effect of the included medicine, they can either be masticate or steadily dissolved in the mouth.

Advantages of medicated lollipop:⁴

- 1. having a patient-specific formulation that is easy to modify.
- 2. Patients who struggle with swallowing may be given lollipops.
- 3. It has a nice flavour and prolongs the duration of a dose of medication remains in the mouth to have a pharmacological effect. Additionally, a chemist can impromptu assemble lollipops with little preparation and duration.
- 4. It prolongs the amount of time a medicine remains in the month to have a certain consequences.
- 5. Simple to assemble with little effort and preparation.
- 6. No longer require water intake because the management strategy, like parenteral, is non-invasive.

Disadvantages of medicated lollipops: 6

- 1. Due to the intense heat needed for formulation, drugs that are heat labile cannot be used in this formulation.
- 2. Drugs having less sore taste are suitable.
- 3. Thermostable drugs are suitable.
- 4. For properly stabilization and safety of stable product ODT requires special packaging.

MATERIALS AND METHODS:

Sitaphal powder, bamboo, pepper, cardamom, and cinnamon all these ingredients are collected from market of Ayurvedic store.



Sitaphala Powder Bamboo powder Pepper powder



Cardamom Powder Cinnamom Powder Fig. No.1: Herbal Powder used to prepare formulation

Methods:

Table No.1: Ingredients and its quantity used to prepare medicated lollipop

INGREDIENT	QUANTITY	USES
Sitaphal	1.6 gm	Antioxidants, Antitussive,
Powder	-	Appetizer, Analgesic, Carminative.
Bamboo	0.8 gm	Expectorant, anti-inflammatory, use
Powder		in respiratory disorders
Pepper	0.4 gm	Bronchodilator, Expectorant,
Powder	-	Decongestant, Anti-inflammatory,
		Anti asthmatic.
Cardamom	0.2 gm	Antioxidant, Digestive Ailments,
Powder		Anti-bacterial, Anti-inflammatory.
Cinnamon	0.1 gm	Antioxidant, Anti-inflammatory,
Powder	-	Antidiabetic, Antimicrobial,
		Anticancer, Lipid-lowering and
		Cardiovascular-disease-lowering
		compound.
Honey	Quantity	Anti-inflammatory, antioxidant and
	Sufficient	antibacterial agent

Formulation of Lollipop:

Medicated lollipop prepared by Heating and Congealing Method.

Step 1: Ingredients were weighed accurately and mixed properly.

Step 2: In a Earthenware, the necessary quantity of sugar were dissolved in water while being heated and stirred to prepared sugar syrup.

Step 3: Then add all these ingredients in the sugar syrup and mix it well.

Step 4: Add required amount of honey in that mixture.

Step 5: The formulated mixture was transfered into the calibrated mould.

Step 6: The formulated lollipop was enclosed in aluminium foil and stored in desiccator to resist moisture uptake.



Fig. No. 2: Formulated Medicated lollipop

RESULT:

Table No. 2: Results of Evaluation Parameter

Sr. No.	Test	Observation
1.	Diameter	2.5cm
2	Thickness	0.6mm
3	Weight Variation	5.5 to 6.5%
4	Hardness	6 - 8 kg/cm ²
5	Friability	5.5%

DISCUSSION:

Organoleptic Characters:

Table No.3: Determined Organoleptic characters of lollipop

Sr. No.	Test	Observation
1	Nature	Hard
2	Colour	Brown
3	Odour	Characteristics

Evaluation Parameter:¹¹

1. Weight Variation:

Five lollipops weighed individually to determine the weight deviation, and the gross weight and standard deviation were computed.

2. Hardness:

Hardness of formulation measured by Monsanto hardness tester. The average value and standard deviation were calculated by selecting five lollipop.

3. Friability:

The Roche friabilator was used to assess the friability of lollipops. Weigh every lolly and record the reading as the starting weight. Weighed lollipop loaded in the friabilator for 4 minutes at 25 rpm. Then reweighed lollipop, and the reading is recorded as the final weight. Lastly, using a formula

Initial weight – Final weight/Initial weight × 100 4. Thickness and Diameter:

The measurement of diameter and thickness was done using five lollipops. Using a vernier calliper, the diameter and thickness of the lollipops were measured. Calculations were made to determine the average and standard deviation.

5. Moisture Content:

In a mortar, the sample becomes weighed down and overpowered. One gram of the pattern was then measured and stored in desiccators for a day. The pattern is weighted 24 hours after creation.

Moisture content = Intial wt.-Final wt.



Fig. No.3: Performed Evaluation Parameter of Medicated lollipop

CONCLUSION:

We can deduce that a pediatric medication infused lollipops were created to address respiratory tract infection as in cough. The several physicochemical characteristics such as taste, pH, odour, colour, and melting points are evaluated with success. Good stability and compatibility were shown in the formulation. Pediatrics draws people in this pharse. Thus, these new medicated lollipop can improves therapy efficiency and dependability.

CONFLICT OF INTEREST:

The authors have no conflicts of interest regarding this investigation.

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