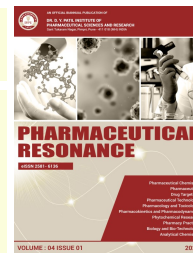




RESEARCH ARTICLE

HERBAL LOLLIPOPS OF GINGER POWDER AND CLOVE OIL TO TREAT ORAL THRUSH



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ABSTRACT : There are several dosage forms in the market; there is a need for more dosage form which acts effectively and locally as well as systematically. The benefits of the present research work is increased retention time of the dosage form in oral cavity and increased bioavailability, reduction in gastric irritation by passing first pass metabolism. Lollipops are flavored medicated dosage form intended to be sucked and held in the mouth or pharynx containing one or more medicaments usually in the sweetened base. Medicated lollipop is designed to improve patient compliance, acceptability. New drug design to this area always benefit for the patient, physician and drug industry. The lollipops were prepared by heating and congealing method using methylcellulose, citric acid as polymer. Oral thrush is a disorder caused by infection of the mouth due to the fungus (yeast) *Candida albicans*. Lollipops containing antifungal medications can provide an attractive alternative formulation in the treatment of oral thrush in pediatric patients. Clove oil and Ginger powder are used as an antifungal drug. For patient's acceptability we need to improve the taste of the drug by using sugarsyrup. Pourability, texture and elasticity is improved by using glycerin. It was found that the formulation containing methylcellulose and sugarsyrup showed better drug release and it was more stable, unlike the other formulations. All the formulations prepared were subjected to various physicochemical parameters like hardness, content uniformity, friability, weight variation etc.

Keywords : Lollipop, Plasticizers, *Candida albicans*, Oral thrush, Clove oil, Ginger.

INTRODUCTION :

Oral thrush is a type of thrush found in the oral cavity. It is a type of fungus (yeast) infection, caused most commonly by *Candida albicans*, but can also be caused by other non-albican species like *C.krsei*, *C. parapsilosi*, *C.glabrata*, *C.tropicalis* and *C.dubliniensis*. As the *Candida* species are a part of the normal flora that lives in the mouth, it is the change in the normal oral environment, rather than the actual exposure or 'infection', that results in the occurrence of this disease.

Oral thrush is creamy white lesions, usually on tongue or inner cheeks. Sometimes oral thrush may spread to the roof of your mouth, your gums or tonsils, or the back of your throat.

Although oral thrush can affect anyone, its more likely to occur in babies and older adults because they have

reduced immunity; in other people with suppressed immune system or certain health conditions; or people who take certain medications. Oral thrush is a minor problem if you're healthy, but if you have a weakened immune system, symptoms may be more severe and difficult to control.

SYMPTOMS :

CHILDREN AND ADULTS -

Initially, you may not even notice symptoms of oral thrush. Signs and symptoms may include:

- Creamy white lesions on your tongue, inner cheeks, and sometimes on the roof of your mouth, gums and tonsils.
- Slightly raised lesions with a cottage cheese-like appearance
- Redness, burning or soreness that may be severe enough to cause difficulty eating or swallowing
- Cracking and redness at the corners of your mouth
- Loss of taste
- Redness, irritation and pain under denture (denture stomatitis)

In severe cases, usually related to cancer or a

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weakened immune system from HIV/AIDS, the lesions may spread downward into your esophagus – the long, muscular tube stretching from the back of your mouth to your stomach (Candida esophagitis). If this occurs, you may experience difficulty swallowing and pain or feel as if food is getting stuck in your throat.^[5]

INFANTS AND BREAST FEEDING MOTHERS

In addition to the distinctive white mouth lesions, infants may have trouble feeding or be fussy and irritable. They can pass the infection to the mothers during breast-feeding. The infection may pass back and forth between the mother's breasts and the baby's mouth.^[7]

Women whose breasts are infected with candida may experience these signs and symptoms:

- Unusually red, sensitive, cracked or itchy nipples
- Shiny or flaky skin on the darker, circular area around the nipple (areola)
- Unusual pain during nursing or painful nipples between feedings
- Stabbing pains deep within the breast.

CAUSES -

Normally, your immune system works to repel harmful invading organisms, such as viruses, bacteria and fungi, while maintaining a balance between "good" and "bad" microbes that normally inhabit your body. But sometimes these protective mechanisms fail, increasing the number of candida fungus and allowing oral thrush infection to take hold.

The most common type of candida fungus is *Candida albicans*. Several factors, such as a weakened immune system, can increase your risk of oral thrush.

RISK FACTORS:

You may have an increased risk of oral thrush infection if any of these issues apply:

Weakened immunity Oral thrush is more likely to occur in infants and older adults due to reduced immunity. Some medical conditions and treatments can suppress your immune system, such as cancer and its treatments, organ transplantation and required drugs that suppress the immune system, and HIV/AIDS.

Diabetes If you have untreated diabetes or the disease isn't well-controlled, your saliva may contain large amounts of sugar, which encourages the growth of candida.

Vaginal yeast infections vaginal yeast infections are caused by the same fungus that causes oral thrush. You can pass the infection to your baby.

Medications Drugs such as prednisone, inhaled corticosteroids, or antibiotics that disturb the natural balance of microorganisms in your body can increase your risk of oral thrush.

Other oral conditions Wearing dentures, especially upper dentures, or having conditions that cause dry mouth can increase the risk of oral thrush.

COMPLICATIONS

Oral thrush is seldom a problem for healthy children and adults.

For people with lowered immunity, such as from cancer treatment or HIV/AIDS, thrush can be more serious. Untreated oral thrush can lead to more-serious systemic candida infections. If you have a weakened immune system, thrush may spread to your esophagus or other parts of your body.^[2]

Medicated lozenges or lollipops are commonly used to treat problems such as infections and inflammation of the oral cavity. Topical preparations are often preferable to systemic meds due to the local effect.

Advantages of using a medicated lozenge or lollipop versus oral dosage forms include a reduction in gastric irritation, bypass of first pass hepatic metabolism and more rapid onset of action.

Lollipops can provide a retention time of up to 30 minutes in the mouth, compared to a conventional form of lozenges having a retention time of about 7 minutes. In particular, it is easier for a child to hold a lollipop in the mouth than it is to retain a lozenge.^[10]

Oral thrush is a disorder caused by infection of the mouth due to the fungus (yeast) *Candida albicans*. Lollipops containing antifungal medications can provide an attractive alternative formulation in the treatment of oral thrush in pediatric patients.^[11]

Lollipops and lozenges can be compounded for:

- Treatment of infection or inflammation
- Topical anesthetic
- Sedation
- Smoking cessation
- Nausea
- Pain relief

MATERIALS AND METHODS

MATERIALS:

The materials required for the present work were procured from different sources. Following drugs, excipients, polymers, and chemicals were used for the formulations and evaluation of medicated lollipop.^[8]

PREPARATION OF MEDICATED LOLLIPOP

The method followed for the preparation was heating and congealing technique (Rawlins E A, 1995). Syrup base was prepared in a porcelain dish dissolving the required amounts of sugar in water on heating and stirring. Then flavor was added between 120°C to 135°C after that temperature was brought down to 90°C and drug, polymer and other ingredients were added and mixed it well. The prepared mixture was poured into the calibrated mould and kept it in refrigerator for 1 hour. The prepared lollipop were wrapped in aluminum foil and stored in desiccator to prevent moisture uptake. The final weight of each lollipop is 5gms.

Medicated lollipops were evaluated for their weight variation, diameter, thickness, hardness, drug content, friability, in-vitro dissolution study and stability study. All studies were carried out in triplicate and average values were reported with standard deviation.

RESULT AND DISCUSSION:

ORGANOLEPTIC FEATURES:

1. Nature - Hard
2. Color - Colorless
3. Odor - Characteristics

Table 1: List of Drugs, Excipients and Polymer

Sr. No.	Drug / Excipient / Polymer / Solvent
1	Ginger Powder
2	Clove oil
3	Sugar
4	Methyl cellulose
5	Citric acid

Table 2: Formulation of medicated lollipop (5 gms) containing Ginger powder and Clove oil

Ingredients	F0 (mg)	F1 (mg)	F2 (mg)	F3 (mg)
Ginger powder	3600	3600	3600	3600
Clove oil	12 drops	12 drops	12 drops	12 drops
Sugar	10000	10000	10000	10000
Methyl cellulose	-	25	50	75
Citric acid	50	50	50	50
Flavor	q.s.	q.s.	q.s.	q.s.

EVALUATION PARAMETERS:

1. Diameter : 2.8cms
2. Thickness : 0.5mm
3. Weight variation : 5.14 - 4.65%
4. Hardness : 6 - 8 kg/cm²
5. Friability : 6.6%

The prepared formulation of herbal lollipops of ginger powder and clove oil was evaluated successfully. The prepared formulation contains ginger powder, clove oil, sugar, methyl cellulose, citric acid which are having wide range of medicinal uses. They have antifungal activity. The herbal lollipop was evaluated for its organoleptic properties, physical properties. It was found that the lollipop was transparent, hard and colorless

Antifungal studies have shown that clove oil is for fast and effective in killing fungal infection. Ginger contains gingerols and shogaols, the anti-inflammatory and antifungal components of the ginger roots. As a bonus, ginger also provides significant liver support while your body is detoxifying the Candida overgrowth. Methylcellulose is a polymer and is used as thickener and emulsifier. It is non-toxic and not an allergen. Citric acid is widely used as an acidifier, as flavoring and chelating agent.

Hence herbal lollipop of ginger powder and clove oil will give the therapeutic activity on oral thrush.

Evaluation parameter of medicated lollipop containing Ginger powder and Clove oil:

1. Weightvariation:

The weight variation were conducted by weighing 5 lollipops individually and average weight and standard deviation were calculated.^[1]

2. Hardness:

The hardness was determined by using Monsanto hardness tester. The test was performed for 5 lollipops and average value and standard deviation was



Fig 1: Prepared lollipops

calculated.

3. Friability:

The friability of lollipops was determined by using Roche friabilator. Weigh all the lollipops and note down reading as initial weight. Then weighed lollipops were placed in the friabilator and operate for 4 minutes at 25 rpm. Then lollipops are reweighed and note down reading as final weight. Finally by using formula

Formula:

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

4. Diameter and Thickness:

Diameter and thickness was conducted by using 5 lollipops. The diameter and thickness of lollipops were measured by using vernier caliper. The average value and standard deviation was calculated.[9]

CONCLUSION:

In the present study, an attempt was made to formulate and evaluate herbal lollipops of ginger powder and clove oil for the treatment of oral thrush. The main interest in such a dosage form was for the development of new herbal dosage form and to see the effect of different herbal drugs on oral thrush.

Herbal lollipops of ginger powder and clove oil were prepared by heating and congealing method. In this study, various formulations were developed using

methyl cellulose, citric acid and sugar. Evaluation parameters like thickness, weight variation, hardness show that they were within the limits.

It can be concluded that the formulations F3 show better results as compared to F0 – F2.

The formulation containing polymer improves the texture, elasticity and portability of the lollipops.

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