

Formulation and evaluation of erythromycin throat paint

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ABSTRACT: -Pharyngitis is a common condition that affects millions of people in the world. It is usually caused by bacterial or viral infections and is characterized by inflammation of the throat, pain, and difficulty swallowing. Erythromycin is a commonly used antibiotic for the treatment of pharyngitis. However, the use of oral erythromycin tablets can be challenging for patients who have difficulty in swallowing. Erythromycin throat paint is a liquid formulation that can be used for the treatment of pharyngitis. The aim of this study was to develop and assess a formulation of erythromycin throat paint for the treatment of pharyngitis.

KEYWORDS:- Throat infection, pharyngitis, antibiotics, antimicrobial.

I. INTRODUCTION: -

Throat paint is a solution with numerous active components that is used to treat mouth and throat infection. These are viscous because the high percentage of glycerin, which is thick in nature sticks to the surface, affecting the site and prolonging the action, throat paint is applied to the affected portion[1].

THROAT INFECTION:-A throat infection can refer to many different conditions that affect the throat including:

1.LARYNGITIS:- Laryngitis is a state that results in inflammation of the larynx, Larynx is also known as the voice box. The larynx is situated in the neck and contains the vocal cords, which vibrate to produce sound when air passes through them[2]. The most common features of laryngitis is hoarseness or loss of voice, which is caused by the inflammation of the vocal cords. Other features may include coughing, sore throat, difficulty swallowing, and a feeling of a lump in the throat. In some cases, fever, fatigue, and body aches may also be present. Laryngitis is generally caused by viral infections, such as the common cold or flu, and is usually a temporary condition that goes

away on its own within a few days to a week. However, it can also be caused by bacterial infections, allergies, irritants such as smoke or pollutants, or overuse of the voice. In rare cases, laryngitis can be a feature of a more serious condition, such as cancer.

Treatment for laryngitis typically presumes resting the voice and avoiding irritants, such as smoking or exposure to pollution. Drinking plenty of fluids and using a humidifier can also help to relieve features. In some cases, medications such as antibiotics (erythromycin), corticosteroids, or antihistamines may be prescribed to treat the underlying cause of the condition. Prevention of laryngitis involves avoiding exposure to irritants and maintaining good vocal hygiene, such as avoiding shouting or speaking loudly for prolonged periods of time. It is also important to practice good hand hygiene to reduce viral infections that can lead to laryngitis..

2.PHARYNGITIS:- Pharyngitis is the inflammation of the pharynx, which is in the back of the throat. It most often refers to simply as sore throat. Pharyngitis is a kind of inflammation of the pharynx, which is just present at the back of the throat[3]. This kind of inflammation shows the feature of a sore throat with a cough but as we know that sore throat is taken place because of virus and only 5–10% of sore throat (pharyngitis) takes place because of bacterial infection, which is caused by Streptococcus bacteria, and disease caused by bacterial throat infection is called strep throat. This kind of disease is commonly found in school-going children (3–15 year) but it may occur to anyone, this disease mainly includes sore throat with high efficiency of pain with difficulty in swallowing, mild fever, and swollen neck glands. Sometimes patients may be found with nausea and headache, it also causes scratchiness in the throat and difficulty in swallowing.

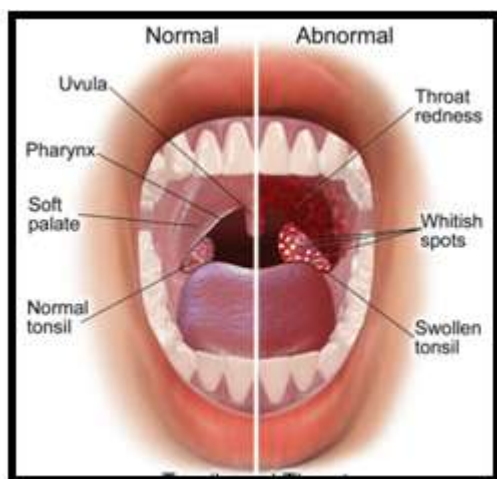


FIGURE 1.1:- showing the pharyngitis

3.TONSILLITIS: Tonsillitis is a frequent illness caused by a viral or bacterial infection that causes the tonsils to become inflamed. The tonsils are two tiny glands in the back of the throat that help to protect the body against infections. Tonsillitis symptoms include painful throat, trouble swallowing, fever, headache, earache, swollen glands in the neck, and occasionally poor breath. Tonsils can become so big in some situations that they block the airway, making breathing difficult.[4].

Treatment for tonsillitis depends on the cause of the infection. If the tonsillitis is caused by a viral infection, rest, fluids, and over-the-counter (OTC) analgesic like acetaminophen or ibuprofen can help alleviate symptoms. If the tonsillitis is caused by a bacterial infection, antibiotics (erythromycin) may be recommended. In severe cases or when tonsillitis recurs frequently, a doctor may recommend a tonsillectomy, which is the surgical removal of the tonsils.

ERYTHROMYCIN:-Erythromycin is a type of antibiotic that is widely used to treat bacterial infections. It belongs to the macrolide class of antibiotics and works by suppressing the growth of bacteria. Erythromycin is available in various forms, including tablets, capsules, liquid suspension, and ointment[5].

Erythromycin is often used to treat respiratory tract infections such as pneumonia, bronchitis, and sinusitis. It is also used to treat skin and soft tissue infections, such as impetigo and cellulitis. In addition, erythromycin can be used to treat certain sexually transmitted infections, such as Chlamydia. The modern research says that it is also used to treat laryngitis, pharyngitis, and tonsillitis-like infections.

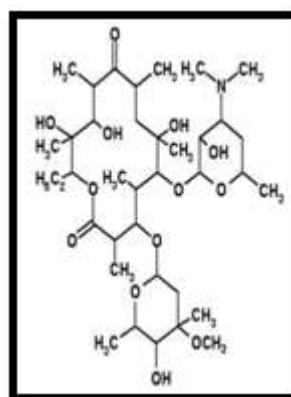


FIGURE 1.2:- STRUCTURE OF ERYTHROMYCIN

Methodology: -

Materials:-Erythromycin API is purchased by India Mart online shopping app in 4200/kg price and other excipients such as glycerin, ethanol, peppermint oil, and iodine, potassium iodide was provided by Rungta Institute of Pharmaceutical Sciences & Rungta Institute of Pharmaceutical Science and Research, Kohka-Kurud, Bilai.

INGREDIENTS	QUANTITY GIVEN
1.Potassium iodide	25g
2.Iodine	12.5g
3.Alcohol	40 ml
4.Distilled water	25ml
5.Erythromycin	2g
6.Peppermint oil	4ml
7.Glycerin	1000ml

TABLE NO.1.1:-INGREDIENT TABLE OF THROAT PAINT.

ROLE OF INGREDIENTS- Potassium iodide is used as a Solubilizer to solubilize the iodine. Iodine is used as an Antiseptic, Alcohol is used as a preservative, Distilled water is used as a solvent

and peppermint oil is used as a flavouring agent, glycerin is used as a base to make solution thick to increase adherence to surface and erythromycin is used for its antibiotic action.

MATERIALS	QUANTITY TAKEN	ACTIVITY
1. Potassium iodide	2.5g	Solubilizer
2. Iodine	2g	Antiseptic
3. Ethanol	10ml	Preservative
4. Distilled water	10ml	Solvent
5. Erythromycin	250mg	Antibiotic
6. Peppermint oil	0.4 ml	Flavouring agent
7. Glycerol	80 ml	Viscosity builder,

TABLE NO 1.2:- COMPOSITION OF ERYTHROMYCIN THROAT PAINT

Method:--First select the excipients based on their chemical properties and compatibility with the erythromycin. Then dissolve potassium iodide in distilled water and add erythromycin and iodine in

this solution then add other excipients like ethanol and peppermint oil (as a flavouring agent) then make up the volume with glycerin erythromycin throat paint was prepared.

PROCEDURE:-

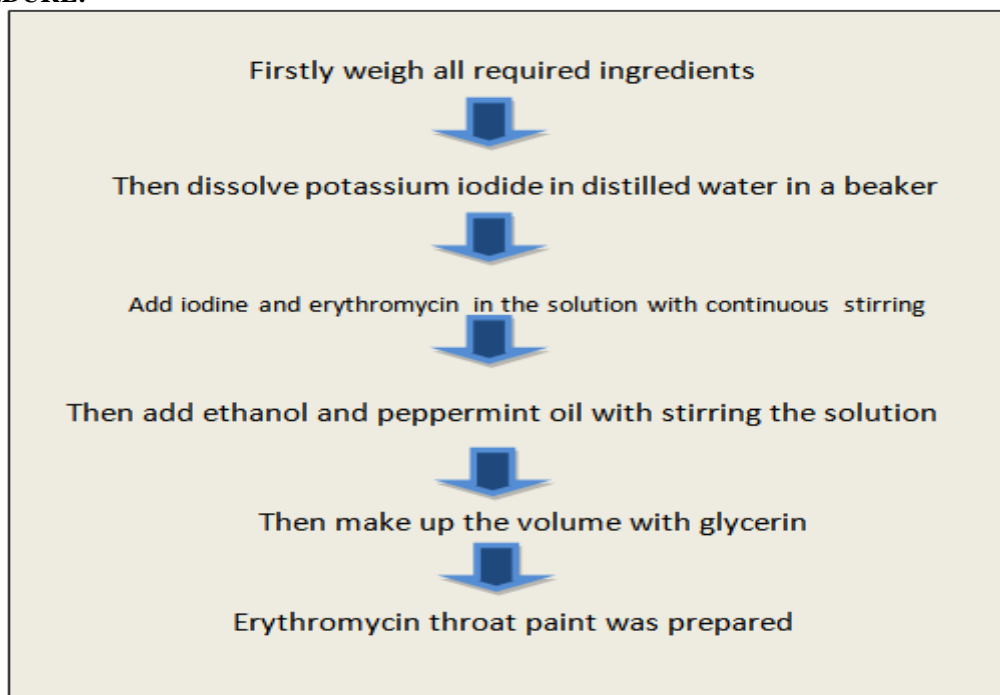


FIGURE 1.3:- METHOD AND PREPARATION OF THROAT PAINT



FIGURE 1.4:-PREPARED ERYTHROMYCIN THROAT PAINT

Evaluation Test of throat paint:- there are various following evaluation test for throat paint

1. Determination of Ph:- Ph is an important evaluation of throat paint to determine the efficacy and safety of product. Optimal Ph range is generally in between 5.5 to 7.5 if it is too high or too low it affect the effectiveness of throat paint. To check Ph by Phmeter is used.



FIGURE 1.5:- PH OF ERYTHROMYCIN THROAT PAINT.

2. Measurement of viscosity:- The viscosity of erythromycin throat paint can vary depending on the specific formulation and manufacturing process. However, the general range of viscosity for erythromycin throat paint is between 1000 to 5000 centipoise (cP). A throat paint with too low a viscosity may not stay in contact with the affected area long enough to provide therapeutic effect, while a throat paint with too high a viscosity may be difficult to apply. Therefore, it is essential to maintain consistency in the viscosity of the erythromycin throat paint during formulation to ensure its efficacy and easy to apply.



FIGURE 1.4:-DIGITAL ROTATIONAL VISCOMETER

3. Spreadability:- The spreadability was determined as the excess amount of formulation (throat paint) was added in between two glass slides and compressed by keeping them under 1000g weight over it for up to 10 minutes. Now weight 50 g was added over the pan which is used here. Note down the time required for separation of slides, that is, when the upper glass slide move from the surface of the lower glass slide.

4. Stability:- This test assesses the appearance, colour, and odour of the throat paint over time. Ph of the erythromycin throat paint should be within the specified range throughout its shelf life. The viscosity of throat paint should remain constant over the time period. Chemical stability of throat paint can be checked by high temperature,

humidity, and light it can be analyzed before and after the stress condition to determine any changes in its properties. The throat paint should not come into contact with the container or closing materials. As this could result in leaching or degradation.

II. RESULTS:-

1. PH OF ERYTHROMYCIN:-The ph of erythromycin throat paint can be examine by digital phmeter firstly start the phmeter then dipped into solution then write down the reading after bipping

of phmeter. The ph of erythromycin throat paint found between 5.5-7.5 of all formulation. giving in the table 1.3 .

SAMPLE	F1	F2	F3	F4	F5	F6
PH	6.2	7.1	6.9	7.2	7.2	7.3

TABLE 1.3:-PH OF VARIOUS FORMULATIONS OF ERYTHROMYCIN THROAT PAINT

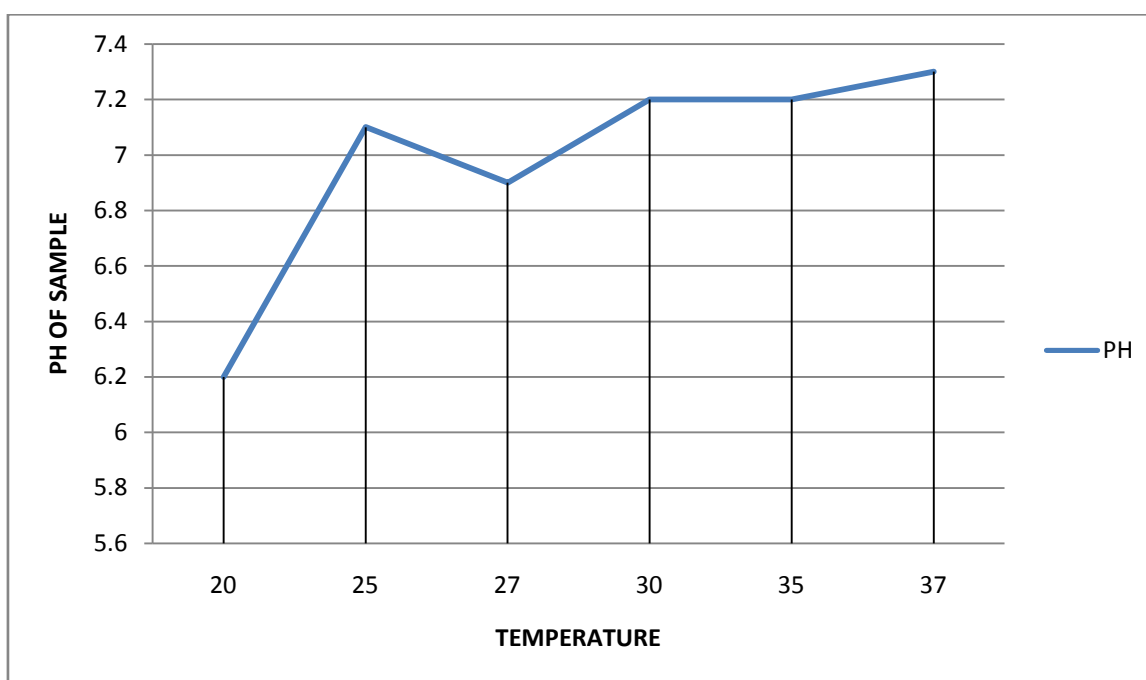


FIGURE 1.5:-GRAPH SHOWING THE PHVS TEMPERATURE

2. VISCOSITY:-The viscosity of erythromycin throat paint found in between 1000 to 5000 Cp (centipoises) viscosity is measured by digital rotational viscometer

SAMPLE	SPINDLE	VISCOSITY
F1	L1	2000cP
F2	L2	1500cP
F3	L3	1200cP
F4	L4	1000cP

TABLE 1.4:-VISCOSITY OF VARIOUS FORMULATIONS

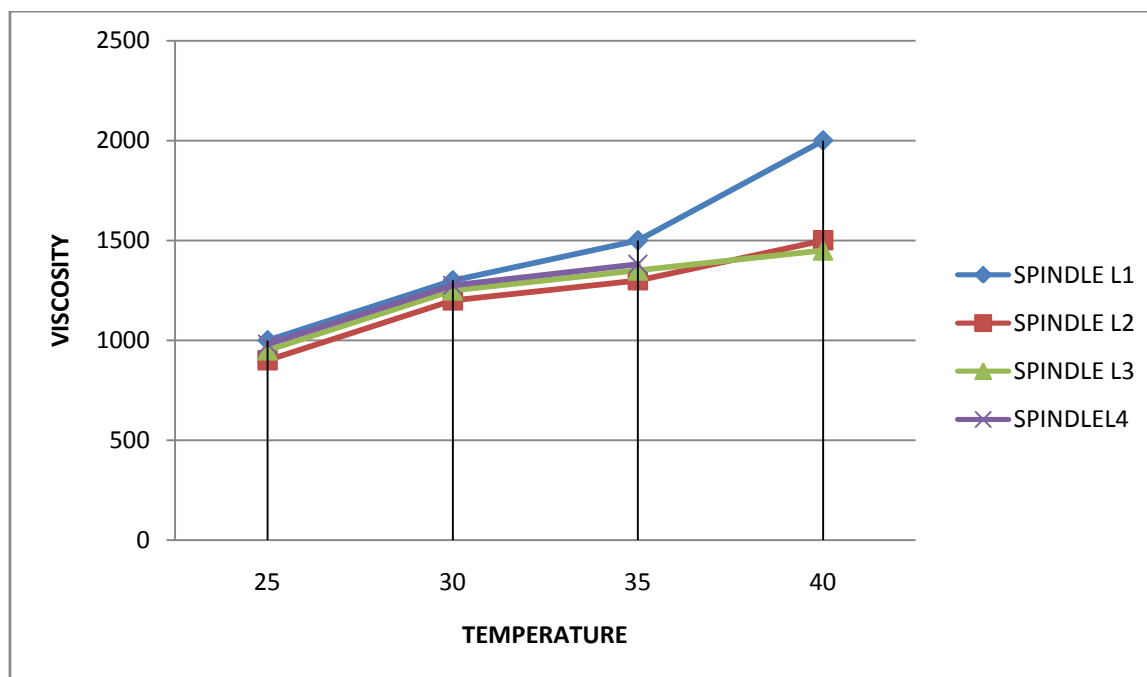


FIGURE 1.6:-GRAPH SHOWING THE VISCOSITY VS TEMPERATURE

III. DISCUSSION:-

The formulation of erythromycin throat paint was successful, and the final product was found to be of high quality. The throat paint was clear, homogeneous, and free from any visible particulates. The pH of the throat paint was within the desired range of 5.5-7.5., and the viscosity was suitable for application to the throat. The drug content was within the specified limits, and the throat paint was stable under normal storage conditions.

IV. CONCLUSION:-

Finally, a formulation of erythromycin throat paint was developed successfully, and the throat paint was found to be of high quality. The throat paint can be used for the treatment of pharyngitis in patients who have difficulty swallowing oral erythromycin tablets. The throat paint can be applied directly to the affected area, providing targeted treatment and minimizing systemic side effects. More research is needed to determine the efficacy and safety of the throat paint in vivo.

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