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# NOVEL FORMULATION AND EVOLUTION OF VAPO-JELLY FOR MANAGEMENT OF SWINE FLU

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## ABSTRACT

Swine origin influenza was first recognized in the border area of Mexico and United States in April 2009 and during a short span of two months became the first pandemic. The currently circulating strain of swine origin influenza virus of the H1N1 strain has undergone triple reassortment and contains genes from the avian, swine and human viruses. Principle of treatment consist of isolation, universal precautions, good infection control practices, supportive care and use of antiviral drugs. Antiviral drugs effective against H1N1 virus include: oseltamivir and zamanavir. Ayurvedic medicines and plant based medicines are using for swine flu, it has less side effect, it is very safe for human beings. More than 700 plants using for many types of disease including swine flu. The proposed work based on herbal formulation for management of swine flu, which include Tulsi, Camphor, Menthol, Eucalyptus oil.by using the jelly base gelatin formulate vepo-jelly. Aromatic volatile oils of above medicinal plants were incorporated in gelatin base and have to inhaled after vaporization.

## INTRODUCTION

Swine origin influenza was first recognized in the border area of Mexico and United States in April 2009 and during a short span of two months became the first pandemic. The currently circulating strain of swine origin influenza virus of the H1N1 strain has undergone triple re-assortment and contains genes from the avian, swine and human viruses. Re-assortment is the process through which a virus organizes its genetic material and thus a hybrid variety of super-virus comes into existence. It is transmitted by droplets or fomites. Incubation period is

2 to 7 days. symptoms are indistinguishable by any viral respiratory illness, and include fever, cough, sore throat and myalgia.

For Treatment & Management of swine flu, there are four FDA-approved antiviral drugs that are sometimes prescribed within the first day or two of symptoms to reduce the severity of symptoms and possibly the risk of complications. These include: Oseltamivir (Tamiflu), Zanamivir (Relenza), Peramivir (Rapivab), Baloxavir (Xofluza)

The herbal formulations are becoming more popular in recent days because of the safety when compared to the synthetic drugs that are regarded as unsafe to human and environment. Ayurveda has the remedy in the form of the miraculous herbs, like Tulsi, Aloe Vera, Giloy. In this review we going to discuss the various benefits of these ayurvedic herbs. These herbs are helpful to prevent swine flu. Ayurveda promotes the concept that if one's immune system is strong, then even if the body is exposed to viruses, one will not be affected. During a pandemic or an epidemic, Ayurveda emphasizes on the immunity of people living in regions affected by viruses. This branch of medicine promotes the intake of special herbs or decoctions to increase the immunity level of the people. Ayurvedic remedies comprise pure natural herbs which are effective in preventing swine flu.

In proposed work, formulate novel formulation “Vepo-jelly” using herbal medicinal plant like Ocimum sanctum (Tulsi), Menthol oil, Eucalyptus oil, Camphor. Gelatin is used as jelly base. Aromatic volatile oils of above medicinal plants were incorporated in gelatin base and have to inhaled after vaporization.

## MATERIAL AND METHOD

**Active pharmaceutical ingredients** - Ocimum sanctum (Tulsi) oil, Menthol oil, Eucalyptus oil, Camphor.

**Jelly base** – Gelatin, Glycerin.

**Table no. 1: Formulation Vepo-Jelly.**

| Sr. No. | Name of Ingredients | J1 | J2 | J3 | J4 |
|---|---|---|---|---|---|
| 1 | Gelatin | 4.4 ml | 8.8 ml | 13.2 ml | 17.6 ml |
| 2 | Glycerin | 1.12 gm | 2.24 gm | 3.36 gm | 4.48 gm |
| 3 | Eucalyptus oil | 0.5 ml | 1 ml | 1.5 ml | 2ml |
| 4 | Menthol oil | 1 ml | 2 ml | 3 ml | 4 ml |
| 5 | Camphor | 0.5 gm | 1 ml | 1.5 ml | 2 ml |

| | | | | | |
|---|---|---|---|---|---|
| 6 | Ocimum sanctum (Tulsi) oil | 0.5 ml | 1 ml | 1.5 ml | 2 ml |
| 7. | Water | Q.S. | Q.S. | Q.S. | Q.S. |

**Formulation of Vepo-jelly**

1. Gelatin dissolved in sufficient quantity of hot water and then glycerin was added with constant stirring.
2. Transfer the above mixture in to the mortar pestle and maintain temperature condition during the mixing of mixture by using hot water bath.
3. With maintaining the above temperature condition all active ingredients were added in order like eucalyptus oil, camphor, menthol oil. Triturate it well until the formation of uniform mass.
4. Remove the mixture from the hot water bath and pour mass mixture in mold and kept in freeze temperature condition to set the vepo-jelly.

**Evaluation test of vepo-jelly**

1. **Determination of pH:** The pH value of vepo-jelly determined by using a pH meter at room temperature.
2. **Uniformity Test:** Assay 10 units individually using an appropriate analytical method.
3. **Evaporation Rate:** A gas chromatographically study was performed on the product before incubation. Product was incubated at room temperature 20 $^{0}$ C for 5 days. Then after a period of 5 days' gas chromatography studies were again performed.
4. **Stability study:** The samples of Vepo-jelly were observed for Stability; the product was kept at 3 different temperatures.

a) Freezer- temp- 2- 8$^{0}$ C
b) Cool-temp – 8- 18$^{0}$ C
c) Normal Room temperature- 25$^{0}$ C

Observe the appearance at the interval of one week.

5. **Anti-viral assay:** In-viro antiviral screening –

**Testing vepo-jelly against Influenza Virus H1N1:** The testing of the sample carried out in accordance with the EN14476:2013 standard of disinfectant testing. The sample was incubated with the equal volume of Influenza H1N1virus in the dilution. Dilution of the sample were made in the cell culture, preferable Dulbeecco's modified Eagle Medium

(DEME) without Fetal Bovine Serum (FBS). This incubation carried out at $37^0$C on susceptible cell line (MDCK cells).

This infection was carried out at in a 96 well plate, keeping 3 replicates of each dilution of the virus. Prior to infection, cell monolayers were washed with serum free medium. H1N1 influenza virus was adsorbed to cells for 60 min. at $37^0$ C, inoculum was removed and cells were grown in DEME with FBS and suitable virus growth medium. They were maintained at 5% $CO_2$ at $37^0$ C for a period of 6-10 days and observer for presence of cytopathic effect (CPE). Uninfected cell & virus infected cells were maintained as control.

On day 5/6 (as per presence of CPE), the medium was removed, cells were fixed with glutaraldehyde & stained with amido black.

## RESULT AND DISCUSSION

1. **pH:** For the measurement of pH of the vepo-jelly, digital pH meter is used. pH of the vepo-jelly is **7.04**.
2. **Uniformity test:** The content uniformity of vepo-jelly is uniform.
3. **Evaporation test:** A gas chromatographically study was performed on the product before incubation. Product was incubated at room temperature 20 $^0$ C for 5 days. Then after a period of 5 days' gas chromatography studies were again performed. The evaporation rate was found out in this manner.

In evaporation test studies it was found that the product gets evaporated after a period of 5 days.

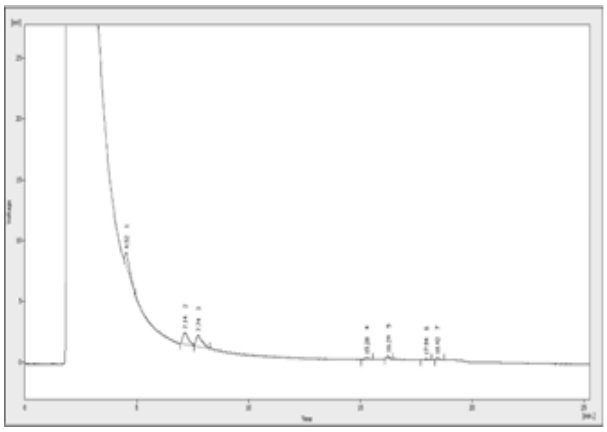

**Fig. no. 1: Vepo-jelly before incubation.**

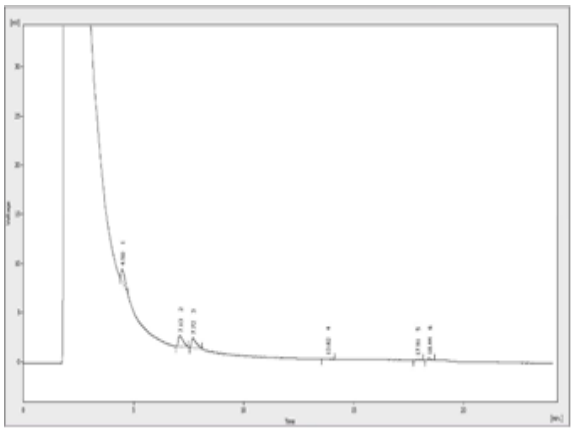

**Fig. no. 2: Vepo-jelly after incubation at $20^0$c for 5 day**

4. **Stability Study:** the product was kept at 3 different temperatures.

i) Freezer- temp- 2- $8^0$ C

ii) Cool-temp – 8- $18^0$ C

iii) Normal Room temperature- $25^0$ C. Observe the appearance at the interval of one week.

- It was observed that at freezer and freeze conditions the product remained stable. But at normal temperatures the compound started to evaporate rapidly.
- If the product is kept in cold temperature conditions only it may remain stable or else in normal room temperatures it gets evaporated and becomes unstable. It also loses its stability.

5. **Antiviral assay**

**Table no. 1: Observation of antiviral assay.**

| Sr. No. | Sample | Concentration | Observation |
|---|---|---|---|
| 1 | Test sample | Undiluted | No CPE observed |
| 2 | Virus control | 1:64 (viral Titer) | Cytopathic effect observed in number of plaques |
| 3 | Test sample + virus | 1:1 | Reduction in cytopathic effect is observed compare to viral control |
| 4 | Cell control | Not applicable | No CPE observed |

The given sample of vepo-jelly in liquid form may potentially anti-viral activity against infection of H1N1 virus.

## CONCLUSION

The Vapo- jelly has tremendous potential to be used as an antiviral drug to treat or as a prophylactic measure against H1N1. The vapo jelly is well tolerated with minimum systemic effects. Furthermore, the drug can also be studied for other respiratory disorders including covid-19 but further and detailed study is required for the same. The vapo jelly is an innovative product which can be used for complete destruction of the viral load as the laboratory results suggests. Clinical trials can further be initiated to co-relate the studies in clinical trials as well. The findings in the current study have proved that the vapo jelly is innovative and very effective treatment in H1N1. This drug has a huge potential in the various respiratory disorders not just upper respiratory disorders. Current surveillance efforts focused on rapid identification of novel strains in humans as well as efforts to minimize the

possibility of cross-infection between species are aimed at detecting and preventing a new pandemic.

Since the product is highly unstable at normal room temperatures further formulation studies and developments should be done to improve its stability and enhance its efficacy. Components should be first stabilized and only then we can further carry out the tests for antiviral activity.

Whether a new influenza pandemic could arise through antigenic 'drift' from an avian influenza virus or antigenic 'shift' through recombination of an avian and human influenza virus can only be speculated on. However, although this question is of crucial importance for future vaccine development, it has much less bearing on antiviral-drug design of the vapo jelly.

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