Original Article

In vitro Stability Testing of Syrup Dosage Form For Hepatitis

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ABSTRACT

The present study was to develop a syrup dosage form for Hepatitis. The newer herbal drugs for Hepatitis were formulated in the form of syrup dosage form.
The need of this study was to overcome the taste of the drug and to improve the therapeutic efficacy of the existing herbal drugs.
For this formulation two crude drugs were used those are *Aegle marmelos*, *Vitex negundo* linn. In these formulation two steps involved were 1) Preparation of Benzene Extract 2) Preparation of Simple Syrup. The materials used are Sucrose, Methyl Paraben, Sodium benzoate, Sodium carboxy methyl cellulose.
This formulation was more stable at the temperature of 4°C & room temperature. This study showed that the stability of the formulation is equivalent to other existing herbal drugs available for Hepatitis. Hence, we found that there is a lot of scope for *in vivo* studies.

Keywords: Syrup dosage form, Hepatitis, *Aegle marmelos*, *Vitex negundo* linn.

INTRODUCTION

Today modern medicine has reached the height. Diagnostic procedure and instruments have been developed. We can replace damaged blood vessels and also transplantation etc. New medicines are floody in the market yet there is considerable increase in hepatic disease, for that reason screening of safer drugs needed in the present medical scenario. Indigenous or traditional knowledge of human health and medicine currently forms the basis of primary health care for the majority of world's population.

The new respect that is emerging for traditional health knowledge should be matched by few investments in appropriately designed research in the development of training capacity to presence and perpetual traditional knowledge in the context of an integrated system of modern and traditional healthcare and by investment in the sustainable use of medicinal plants.

Nature is a movement – Back to nature. No doubt science technology have made more comfortable, but they also introduced us, to a new lifestyle, away from nature with chemicals, fertilizers, pollutions,

junk food, alcohol, tobacco-full too tension, anxiety, stress & strains. Is that all? They have also ushered in spite of diseases, some of which were unknown to mankind or not as prevalent as they are today –like Arthritis, Blood Pressure, Cancer, Diabetes, Respiratory and skin diseases, Ulcers, so on and so forth, while these disease do not affect wild animal, which lead their life's admist nature, they affect domestic animals which are forced to lead the same unnatural life, with their masters.

This is where nature provides us drugs in the form of herbs, plants and algae's to cure the incurable disease without any toxic effect. Plant kingdom holds many species of plants containing substances of medicinal value.

Indians are obviously taking care for medicinal plants because they know so much about the medicinal plant and have done so much work on their application probably no other medical culture in the world has so extensive. In principle all plants have a potential medicinal value, although in practice a plant is referred to as medicine.

The maximum numbers of medicinal plants are utilized by the folk traditions followed by Tibetan Medicine, Ayurveda, Siddha, Unani, and Homeopathy & Modern respectively.

Ayurveda

This system has a much wider recognition and prevalence in the past as early as of human civilization and Vedic period. Out of total number of over, 15,000 plants species in India about 2000 are known to have medicinal properties. All the main classical works on Ayurveda such as CHARAKA SAMHITA, SUSRUTA SAMHITA, ASTANGA SAGRAHA and ASTANGA HRIDAYA deal with drugs their composition and action, addition to the other aspects of medical systems.

Scope

In general any nation has a system of its own traditional medicine in our country, modern [western] and Indian medicine is practiced side-by-side and both are officially supported. Indian medicine is made up of five stems, each with its own training schools and hospitals. Ayurvedic, Homeopathy, Unani, Yoga and Naturopathy. Ayurvedic, the oldest and the most widely practiced, was the sole medical system in India. This system in well found on the basic principles of nature moreover, it has got certain district features of its own.

This system of medicine permitted the length and breadth of India at a later period at present many attempts have been successfully made for the documentation and scientific validation of the therapeutic efficacy of the numerous Ayurvedic drugs.

Hepatitis Primary Studies

Many viruses affect the liver function. But only a few are truly infectious to liver itself leading to clinically significant hepatitis. The term viral hepatitis refers to the diseases caused by this subgroup.

Five human viruses have been identified, including hepatitis A (HAV), B (HBV), C (HCV), D (HDV), E (HEV). All forms of viral hepatitis have a similar pathology, causing an acute inflammation of the entire liver.

1. Hepatitis A

It is the major cause of acute hepatitis worldwide, accounting for 20-25% of clinical hepatitis in the developed world. Most attacks are mild and often pass unnoticed by the patient. HAV is spread via the fecal-oral route. It has incubation period of 2-7 weeks.

2. Hepatitis B

The prevalence of hepatitis B (HBV) is low in the USA and Britain, with

approximately 0.1-0.2% of the population having markers that indicate that they are chronic carrier. HBV is parentrally transmitted. Acute HBV infection has an incubation period of 3-6 months.

3. Hepatitis C

It is a blood borne virus with greater infectivity than the human immunodeficiency virus (HIV). The global prevalence of HCV infection is estimated at around 3% in the general population with more than 150 million carriers worldwide. HCV is transmitted parenterally.

4. Hepatitis D

It can establish infection only in patients simultaneously infected by HBV. It is acquired in the same way as HBV infection, can cause both acute and chronic hepatitis.

5. Hepatitis E

It is endemic in areas of poor sanitation, where it is transmitted enterically and leads to acute hepatitis. It has an incubation period of 40 days.

6. Hepatitis F

Hepatitis F, another distinct non-A, non-B hepatitis virus, is likely to exist. A virus designated as hepatitis F virus was isolated from the stool of a patient with hepatitis. The hepatitis F was develops in persons receiving coagulation factor from pooled blood of the patients who have already recovered from HCV infection.

7. Hepatitis G

Recently, new blood borne viruses were discovered simultaneously by two investigators and named hepatitis G virus (HGV). These viruses were later determined into the isolates of the same single stranded RNA virus, identified as a members of the flaviviridae family and are now referred to as HGV.

The primary rate of transmission is parental. The virus is often present in 50% of injection drug users, 30% of hemophiliacs and 20% of haemodialysis patients. There is also evidence of a sexual transmission. The site of viral replication has not been identified.

Non-A, Non-B, Non-C Hepatitis viruses

Non-A, Non-C Hepatitis was the term used previously to describe Hepatitis thought to be due to a virus but not HAV or HBV. HCV and HEV are the main hepatitis viruses to emerge from this group. Further such viruses do exists, but the hepatitis viruses described above now accoynt for the majority of Hepatitis virus infections Hepatitis-B virus.

Jaundice

Definition

It is defined as yellowish discoloration of the skin and mucous membrane due to excess amount of bilirubin present in blood.

Types

1. Hemolytic jaundice

If the concentration of bilirubin in the serum rises above normal due to more formation as a result of increased erythrocyte destruction, hemolytic jaundice results. There is lemon-yellow tinge of bulbar conjunctiva.

2. Obstructive (Regurgitation) jaundice

This condition occurs from blockage of the hepatic or common bile ducts. The bile pigment passes from blood to the liver cells as usual. However, failing to be excreted by the bile capillaries, it is

absorbed into the hepatic veins and lymphatic.

3. Hepatocellular jaundice

This type of jaundice is caused by liver dysfunction s a result of the damage tom the parenchyma cells by infection, toxins and liver poisons. At a certain stage, the inflammation and damage to liver cells become severe leading to part obstruction to the flow bile. These results in the absorption of conjugated bilirubin and bile into the general circulation cause a Orange-Yellow tinge of bulbar conjunctiva.

Crude Drugs

This drug formulation was prepared by using following crude drugs:

1. *Aegle marmelos*
2. *Vitex negundo* linn

METHODOLOGY

Extraction of plant material

The plant was collected in and around Chittoor in the month of February. The whole plant material was dried in the shade for two months. Then shade dried plant was subjected to get coarse powder. The coarse powders were subjected to cold maceration apparatus by using various solvents according to their potency.

Procedure for preparation of syrup

Preparation of Syrup: Two steps are involved.

1) Preparation of Benzene Extract.
2) Preparation of Simple Syrup.

1. Preparation of Benzene Extract

The coarse powder was extracted with 2-3 liters of Benzene (60-80°C) by continuous hot percolation using cold maceration apparatus. After completion of extraction, it was filtered and the solvent was removed by distillation under reduced pressure. The extract was seen in a blackish green color residue.

2. Preparation of Simple Syrup

Simple Syrup

Materials Required

Sucrose – 666.7gms
Distilled water q.s to 1000 ml
Methyl paraben (q.s)

Procedure

The sugar is heated with the whole of the water until get dissolved. The solution cooled and the product adjusted to the original weight the addition of water i.e. the water lost by evaporation during heating.

Syrup Preparation

Materials Required

Benzene extract - 200mg
Sodium benzoate - 0.25gm
Sodium carboxy methyl cellulose - q.s
Simple syrup q.s to produce 500ml
Amaranth - quantity required

Procedure

1) The Benzene extract of both *Aegle marmelos*, *Vitex negundo* linn was taken and water syrup added to the above and mixed together.
2) To the above solution add 0.25gm of Sodium Benzoate and mixed by using mixer.
3) Heat the above solution and add Sodium Carboxy Methyl Cellulose and mix using mixing vat.
4) Add Syrup to make up the volume required.
5) Add Amaranth solution as coloring agent.

Use

Hepato Protective Agent.

Product Studies

Identity, Purity, Strength

Foreign Matter : Not more than 1%
Total Ash : Not more than 4.26%
Acid insoluble Ash: Not more than 1%
Alcohol soluble extractive : Not more than 0.82%
Water soluble extractive : Not more than 1.42%

Stability Studies

The formulation was studied for stability profile continuously for 60 days at different environmental condition such as 4°C, Room temperature & 45°C. The formulation were filled in small containers and kept in refrigerator to attain 4°C environment, 45°C was attained by keeping formulation in hot air oven.

RESULT AND DISCUSSION

Stability data for formulation

The stability test for formulation was done at room temperature, at 45°C and 4°C.

See the table no: 1

In the present study newer herbal drugs were selected and formulated for hepatitis in the form of syrup due to overcome the taste of the drugs. In the analysis of drugs the values obtained were within the standard values in the pharmacopoeias.

Stability of the products tested in various stress conditions were enlisted in table no.2. The products are stable in 4°C & Room temperature up to 60 days. Slight change observed in pH of the product kept in the temperature 45°C.

Much attention has been given to develop newer drug for hepatitis to improve the therapeutic efficacy of existing herbal drugs. The stability studies also confirmed the stability of the formulation at different temperature were within the limits.

Hence, we can found that there is a lot of scope for *in vivo* studies.

CONCLUSION

All the stability studies clearly revealed that the stability of the formulation is equivalent to other existing herbal drugs available for Hepatitis. Hence, we found that there is a lot of scope for *in vivo* studies.

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Table 1. Stability data for formulation

(At room temperature)

CHARACTERS	AFTER 5 DAYS	AFTER 10 DAYS	AFTER 20 DAYS	AFTER 45 DAYS	AFTER 60 DAYS
COLOUR	Pale Green	Pale Green	Pale Green	Pale Green	Pale Green
pH	6.8	6.8	6.8	6.8	6.8
VISCOSITY	No Change	No Change	No Change	No Change	No Change
TASTE	Slightly Acidic	Slightly Acidic	Slightly Acidic	Slightly Acidic	Slightly Acidic

(At 45°C)

CHARACTERS	AFTER 5 DAYS	AFTER 10 DAYS	AFTER 20 DAYS	AFTER 45 DAYS	AFTER 60 DAYS
COLOUR	Pale Green	Pale Green	Pale Green	No Change	No Change
pH	6.8	6.8	6.8	7	7
VISCOSITY	No Change	No Change	No Change	No Change	No Change
TASTE	Slightly Acidic	Slightly Acidic	Slightly Acidic	No Taste	No Taste

(At 4°C)

CHARACTERS	AFTER 5 DAYS	AFTER 10 DAYS	AFTER 20 DAYS	AFTER 45 DAYS	AFTER 60 DAYS
COLOUR	Pale Green	Pale Green	Pale Green	No Change	No Change
pH	6.8	6.8	6.8	6.8	6.8
VISCOSITY	No Change	No Change	No Change	No Change	No Change
TASTE	Slightly Acidic	Slightly Acidic	Slightly Acidic	Slightly Acidic	Slightly Acidic