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FORMULATION AND EVALUATION OF HERBAL MEDICINE USED TO TREAT HIV AND AIDS

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ABSTRACT:

Human immunodeficiency virus infection / acquired immunodeficiency syndrome (HIV-AIDS) is a viral infection that affects the human immune system. The aim of this study is to develop and evaluate a tablet that is useful in the treatment of HIV AIDS due to the immunomodulatory properties of the ingredients used in the formulation. Ingredients like Amla, Beheda and Hirda were used as medicinal agents. Amla has antioxidant properties. Baheda (Bibhitaki) has anti-inflammatory, immunomodulatory and antioxidant properties.

Haritake has anti-inflammatory, analgesic, immunomodulatory and wound healing properties. The medicinal properties of these three plants can be considered effective in modulating the immune system to fight HIV infection and strengthen the health of HIV patients.

Keywords: HIV infection, Amla, Beheda and Hirda.

INTRODUCTION:

Human immunodeficiency virus infection / acquired immunodeficiency syndrome (HIV-AIDS) is a viral infection that effects the human immune system. The HIV virus comprises of two types, HIV-1 and HIV-2, and is a retrovirus that infects and destroys T-cells, macrophages and dendritic cells. HIV-2 is predominant in West Africa, whereas the more virulent HIV-1 is the cause of the majority of infections globally.

What Is AIDS?

AIDS is the late stage of HIV infection that occurs when the body's immune system is badly damaged because of the virus.

What Is HIV?

HIV (human immunodeficiency virus) is a virus that attacks cells that help the body fight infection.

HIV and AIDS are a global phenomenon with the dynamics and consequences played out differently across the world. The burden is not borne equally. It is the deprived and powerless who are most likely to be infected and affected.

Amla or Indian gooseberry (Emblica officinalis Gaertn) is known for its medicinal and therapeutic properties from the ancient time in India and considered as a wonder fruit for health conscious population. It is enormously used as a tonic to restore the lost body's energy.

Amla is highly nutritious and is one of the richest sources of Vitamin C, Amino acids and minerals. It contains several chemical constituents like tannins, alkaloids and Phenol.

Amla (Emblica officinalis): Also known as Indian gooseberry, it's rich in vitamin C and has antioxidant, anti-inflammatory, and immune- modulating properties.

Bheda (Terminalia belerica): Also known as Baheda, it's a powerful antioxidant with anti-inflammatory and anti-diarrhea properties.

Harada (Terminalia chebula): Also known as Haritaki, it's a revered herb in Ayurveda, with antioxidant, anti-inflammatory, and adaptogenic properties.

These herbs are often used together in various formulations, like the famous "Triphala" churna (powder), which combines Amla, Bheda, and Harada in equal proportions. Triphala is considered a rasayana (rejuvenative) and is used to support overall health, digestion, and detoxification.

DRUG PROFILE :

HARDA :- (Terminalia chebula)

Synonyms :-

Chebulic myrobalan, Harde, Haritaki

Biological Source:- Myrobalan contains dried, ripe, and fully matured fruits of Terminalia chebula Retzr.

It contains not less than 5.0% of chebulagic acid and not less than 12.5% of chebulinic acid.

Family :- Combretaceae.

Chemical Constituents:-

Myrobalan fruits are an important source of tannins. Tannins of myrobalan are of pyrogallol type (hydro sable tannins), yield chebulic acid & d- galloyl.

Chebulic, chebulinic, ellagic & gallic acids are the other contents of myrobalan

Uses :-

Astringent, laxative, stomachic & tonic.

The laxative property of myrobalan is due to anthracene derivative present in the pericarp.

Ingredient in the formulation of Triphala.

BAHEDA :-

Synonyms :-

Belleric myrobalan, Baheda, Bibhitaki are other names of Bahera. **Biological Source :-**

It consists of dried ripe fruits of the plant Terminalia belerica Linn.

Family :- Combretaceae.

It should contain not less than 0.3 per cent of ellagic acid and 0.75 per cent of gallic acid in dried form.

Chemical Constituents :-

Bibhitaka fruits contain several phytochemical (chemical compounds that occur naturally in plants) constituents, such as:- beta-sitosterol, gallic acid ellagic acid ethyl gallate galloyl glucose chebulagic acid & a cardiac glycoside, bellaricanin. These chemicals give bibhitaka its therapeutic values.

Uses of Baheda :-

Combat various infections

Beneficial for promoting hair growth

Anti-inflammatory and anti- ulcer properties

Reduces inflammation and swelling

Relieves throat soreness, asthma, cough

AMLA –

Synonym :-

Emblica, Indian gooseberry, Amalki

Biological Source :- this consists of dried as well as fresh fruits of the plant Emblica officinalis, belonging to the Family Euphorbiaceae

Family :- Euphorbiaceae

Chemical Constituents: -

The principal chemical constituent of Amla is vitamin C (650-900 mg/100 g). It also contains tannins (5%), glucose, pectin. and minerals like iron, phosphorus and calcium.

Tannins are mixture of Gallic acid, ellagic acid and phyllembin. The presence of the tannin prevents the oxidation of vitamin .

Uses-

Anti diabetic

Hypolipidemic,

Antioxidant,

Antibacterial, etc.

MATERIAL & METHOD :

MATERIAL :

Plant Material Collection :

The required herbal drugs i.e amla, behda, harda fruits were collected from the local garden .

Collected herbs were washed using distilled water and dried under shade in controlled temperature & pressure .

Then herbs were coarsely powdered using mortar pestle, and dried at controlled temperature using hot air oven.

Preparation of 1% starch solution :

Take 100 ml distilled water in a beaker. Take 1 gm of starch powder and mix in 100 ml distilled water. Stir continuously until all powder was mix properly.

Preparation of 1% HPMC-10 solution :

Take 100 ml distilled water in a beaker. Take 1 gm of HPMC-10 powder and mix in 100 ml distilled water. Stir continuously to form a jelly-like appearance

METHOD :

The powdered drugs are mixed using wet granulation method.

Wet granulation :

Wet granulation involves the massing of a mix of dry primary powder particles using a granulating fluid.

The fluid contains a solvent which must be volatile so that it can be removed by drying, and be non-toxic.

The granulation liquid may be used alone or, more usually, as a solvent containing a dissolved adhesive (binding agent) which is used to ensure particle adhesion once the granule is dry.

In the traditional wet granulation method the wet mass is forced through a sieve to produce wet granules which are then dried.

A subsequent screening stage breaks agglomerates of granules and removes the fine material, which can than be recycled.

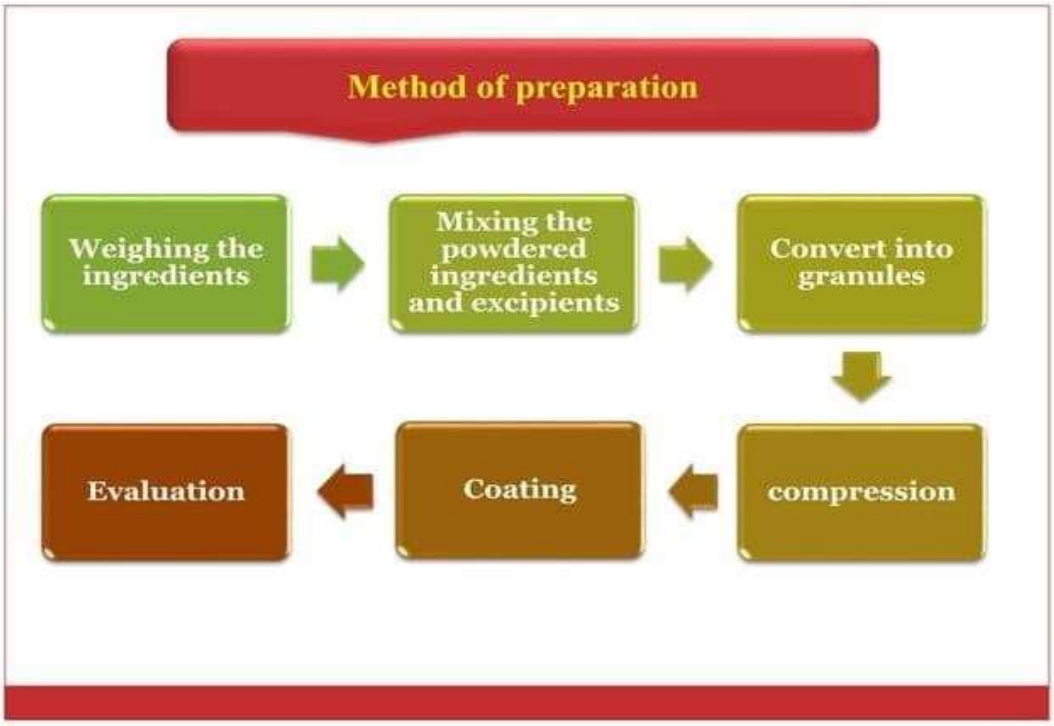


Fig 1 : Methods of Preparation

Table No:1 Formula

Sr No.	Ingredient	Quantity
1	Harda	65mg
2	Beheda	150mg
3	Amla	265mg
4	Starch	5mg
5	Dist. Water	QS
6	Talc	3.5mg
7	Mannitol	5mg
8	HPMC(10)	4.5mg
9	Magnesium Sterate	2mg
10	TOTAL	500mg

PROCEDURE:

Weighing all the Ingredients as per formula. i.e (Harda , Beheda , Amla)

↓

Prepare powered of above three ingredients.

↓

Mixing the powered ingredients and Add Excipients.

↓

Add a Starch into a Warm Hot Distilled water dissolve a starch upto a clear solution .

↓

Prepare a granules in the sieves (No .44).

↓

Then Compressed the granules to the tablet punching machine.

↓

Prepared the tablet and Evaluation the tablet.

EVALUATION PARAMETERS :

Colour : Reddish Brown

Size and shape :

shape: Round

b)size:small=5-7mm in diameter;medium=8-10mm in diameter ;large=11-13mm in diameter

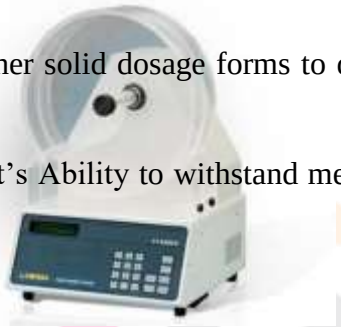
Hardness test :

Hardness testing is an important quality control step in tablet manufacturing, as it helps ensure that tablets will Remain intact and maintain their desired dosage when handled and transported.

Hardness testing is an Important tool for ensuring the quality and consistency of tablet products, and helps manufacturers identify And correct any issues that could impact tablet performance or safety. By the Monsanto Hardness Tester the Hardness of the immediate release tablet is 3.5kg/cm2

Friability test:

The friability test is a quality control test performed on tablets or other solid dosage forms to determine their Resistance to abrasion or breakage during handling and transportation. The test is a measure of the tablet's Ability to withstand mechanical stress and maintain its physical integrity.



•Total weight of 6 tablets (Immediate release tablet) =3035mg
•After Friability test total weight of 6 tablets = 3027mg
•Percentage of weight loss = 0.20%

Disintegration test:

6 Tablets (Immediate release dosage form) to test the disintegration. The average weight of the tablets is 500mg

Tablet No	Disintegration time(mi
1	12.36
2	14.26
3	11.16
4	15.42
5	12.78
6	14.50
Average Time	13.41 min

Dissolution test :

Dissolution of immediate release tablets refers to the process by which the tablet disintegrates and releases the active pharmaceutical ingredient (API) ino solution in the gastrointestinal tract.

The dissolution rate and extent of the tablet are critical for the drug to be absorbed and produce the desired therapeutic effect. Immediate release tablets are designed to release their contents rapidly, usually within 30 minutes, in order to provide fast relief of symptoms or achieve rapid onset of action.

The rate and extent of dissolution of these tablets depend on various factors such as tablet formulation, manufacturing process, and physiological factors in the gastrointestinal tract.

The dissolution of immediate release tablets is evaluated using various dissolution tests, such as the USP dissolution test, which involves placing the tablet in a dissolution medium and measuring the amount of drug released over time.

The results of dissolution tests are used to ensure the quality and consistency of the tablets and to ensure that the drug is being released as intended.

No Of Tablet	Time (min)	Absolute concentrate	Drug release in 1 ml	% Drug release	Cumulative drug release
15	0.165	41.25	185.625	37.13%	37.125
30	0.133	33.25	149.625	29.93%	67.05
45	0.163	40.74	183.375	36.68%	103.725

Average weight :

The average weight of 12 immediate release tablet is 503.01mg.

RESULT :

Table no 2 : Result

Sr.No	Test	Result
1	Color	Reddish Brown
2	Shape	Round
3	Size	10mm in diameter
4	Texture	Smooth surface with a slight roughness
5	Odour	Slightly pungent
6	Taste	Slightly astringent

The tablet passed the above tests and the result complies with the test.

CONCLUSION:

Amla , herda , behda are the the traditional medicinal herbal drugs which having various medicinal activities but this research is focused on Treatment of HIV & AIDS . The powdered drugs was used to formulate tablets. Wet granulation was done by using different binders and making formulation.

Formulation study was carried out and gives good angle of repose, disintegration time , hardness like properties of prepared tablet. The compression of prepared tablets, were evaluated and gives satisfactory results.

Based on the results it is concluded that the formulation and evaluation are good. The pharmacological evaluation is required for the treatment of HIV & AIDS.

Further in- vivo and in vitro studies are required to confirm it’s Pharmacological Activity and validate it’s administration in humans.

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