THE RESEARCH ON- HERBAL FORMULATION AND EVALUATION ANTI-HYPERTENSIVE TABLET

Kunal S. Rewale[1*]; Nitin B. Sawant[2*]; Dr . Megha T. Salve

Department of Bachelor in Pharmacy

Shivajirao Pawar College of Pharmacy, Pachegaon, Ahmednagar-413725

ABSTRACT: In this research paper we study about antihypertensive properties of herbal plant known as Sarpagandha plant and Arjuna plant and trying to develop its supplement in form of oral solid dosage form i.e. tablet form. There is need to long time study for develop new tablet, in this research we cover all parts to develop tablet dosage form

KEYWORDS: Arjuna Sarpagnadha extraction; high blood pressure; tablet formulation

INTRODUCTION:

Hypertension or high blood pressure is a chronic medical condition in which the arterial blood pressure is elevated (normal blood pressure is 120/80 mm Hg). High Blood Pressure may lead to heart failure, stroke, coronary heart disease, kidney failure etc and may affect lungs, brain and heart. It is an important global problem and a very good percentage of people all over the world are affected by blood pressure.

SR NO.	COMMON NAME	BOTANICAL NAME OR FAMILY	PARTS USED	MEDICINAL USED
1.	Arjuna	Terminalia arjuna Fam-Combretaceae	Stem bark.	It is used as a cardiotonic. The drug exhibits hypotensive action with vasodilatation and decreased heart Rate
2.	Sarpa Gandha	Rauwolfia Serpentina	Root & bark	This herb has sedative and antihypertension property

- **Morphology :**

1. **Sarpagandha plant:**

Fig no. 1 : Sarpagandha plant & roots

Sarpagandha is an important Ayurveda drug used for treating many diseases including high blood pressure. Rauwolfia serpentina is the genuine source plant for Sarpagandha and it is a critically endangered species belonging to the family Apocynaceae. The present study is aimed at finding out an appropriate substitute for the endangered species R. Serpentina by evaluating the phytochemistry and biological activities of allied species such as Rauwolfia tetraphylla L, rauwolfia hookeri S.R.Sriniv. & Chithra, rauwolfia micrantha Hook.f., and Rauvolfia verticillata (Lour.) Baill.

2. Arjuna plant:

Fig . no. 2: Arjuna plant & bark

T. arjuna grows to about 20–25 metres tall; usually has a buttressed trunk, and forms a wide canopy at the crown, from which branches drop downwards. It has oblong, conical leaves which are green on the top and brown below; smooth, grey bark; it has pale yellow flowers which appear between March and June; its glabrous, 2.5 to 5 cm fibrous woody fruit, divided into five wings, appears between September and November

- **Materials and Data:**
- **Extraction process:**

1. Extraction of Sarpagandha

I. The plant materials were shade dried and pulverized.

II. Five grams each of the sample was successively extracted with various solvents like n-hexane, chloroform, and methanol by refluxing for 6 h.

III. Crude extracts were prepared separately with methanol, water, and hydro alcohol (ethanol: water 50:50) using the reflux extraction method.

IV. The process was repeated in triplicates.
V. The final extracts were pooled and concentrated at 40 °C using a rotary evaporator (Heidolph, Germany) and it was made up to 100 ml with respective solvents in standard flasks.
VI. The extracts were kept under refrigerator

2. Extraction of Arjuna

Preparation of Extract Authentication was done by the below process

I. The leaves washed thoroughly 2-3 times with running tap water.
II. The leaves were dried in room temperature for 13-15 days and then properly dried the leaves under shade, after complete shade drying the plant material was grinded in mixer.
III. The powdered leaves ware weighed and soaked in 100 ml methanol.
IV. Supernatant was separated and precipitated was shaken with 100 ml ethanol and latter in distilled water in volumetric flask.
V. The flask containing the leaves was shaken in 5-10 min left to stand for 24h at room temperature.
VI. After 24h mixture was filtered then under reduced pressure and redissolved in solvent to check the presence or absence of phytochemical constituents in Terminalia arjuna plant.

- **Evaluation of parameters**

- **Preformulation studies**

1. Angle of repose

By using funnel method, angle of repose was determined. In a funnel ,the accurately weighed blend was taken. The funnel height was set agreed in a manner that the funnel tip just touches the “apex of the heap” or “head of blend”. Through the funnel “the drug excipient blend” was allowed to flow freely on to the surface. Table shows the relationship between Angle of Repose and Powder Flow. The diameter of the powder cone and angle of repose were calculated by using the following equation

Tan θ = h/r

Where h = height of powder cone formed ,r = radius of the powder cone formed

Relationship between angle of repose (θ) and powder flow

Height (h)=25mm

Diameter -84 mm and radius- 42

r= 42 mm

tan θ= h/r

=25/42 =0.59

θ =tan-1 (0.59)

θ =30°

2. Bulk density

By pouring a weighed quantity of blend into graduated cylinder and measuring the volume and weight .

4.8 gm in 50 ml measuring cylinder

Bulk Density = Weight of the powder / volume of the packing

=5/39

Bulk Density =o.128 w/v

3. Tapped bulk density

A known mass of drug excipient blend was placed in a graduated cylinder. The cylinder was tapped on to a hard surface from the height of 10 cm at two second interval. Tapping was continued, “until no further change in volume was noted”.

5 gm In 50 ml measuring cylinder = tap volume 50ml =35ml

Tapped Bulk Density = Weight of the powder / volume of the tapped packing

=5/35

Tapped Bulk Density =0.143

4. Hausner ratio

= tap density/bulk density

=0.143/0.128
=1.1171

5. Compressibility index

The Compressibility index of the blends was determined by Carr's compressibility index. Table shows grading of powders for their flow properties

Compressibility index (%) = (Tapped Bulk Density-Loose Bulk Density) x 100 / Tapped Bulk Density

=(0.143-0.128)x 100/0.143*
(0.015)x 100

Compressibility index (%) =10.48

Cars index shows good flow properties of our formula

- **Grading of powders for their flow properties**

Sr no.	Parameters	Results
1.	Angle of repose	30 $^{0-}$ (slight good)
2.	Loose bulk density	0.128
3.	Tapped bulk density	0.143
4.	Hausner ratio	1.1171 (excellent)
5.	Compressibility index	10.48 (good)

Formula:

Sr. no	Material	Quantity %
1.	API-1	250 mg
2.	API-2	150 mg
3.	Binder	19%
4.	lubricant	4%
5.	Disintegrant	2%
6.	Sweeteners	-

- This tablet is formulated by wet granulation process.
- Where ,

API-1: Arjuna powder
API-2: Sarpagandha Powder
Binder: starch
Lubricant :talc and mg stearate
Disintegrant: MCC
Sweetener: sucrose

- **Formulation process fig.no.: 3**

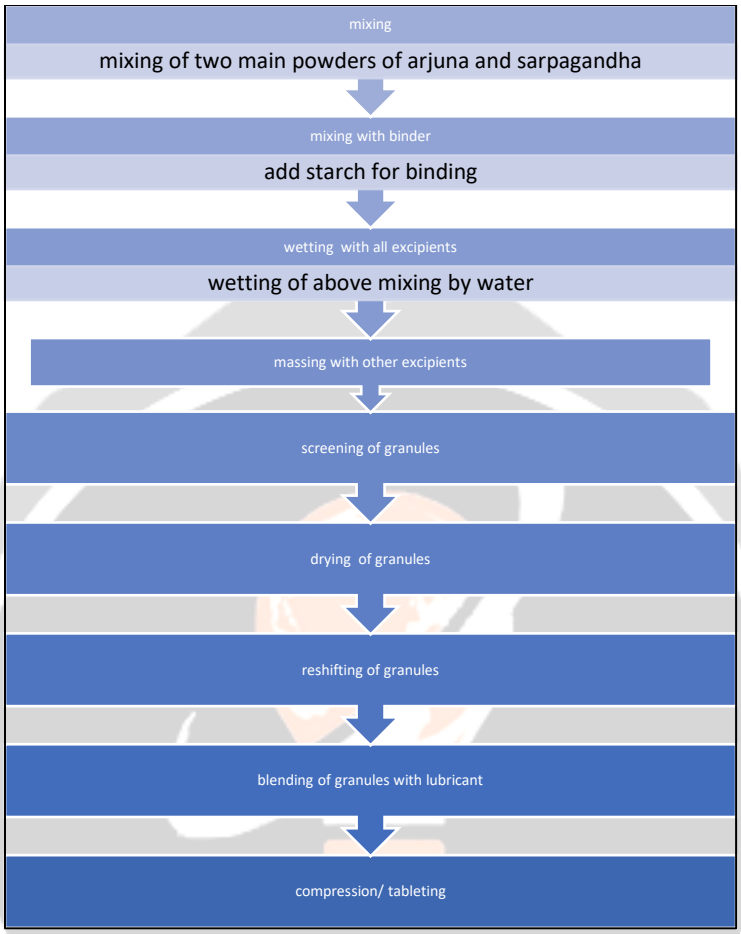

Fig :4 Our compress tab

- **Take time:**

Empty Stomach in the morning and in the late afternoon or early evening, or 2 hours after a meal.

- **Precautions & Warnings to Be Taken**

- **Pregnancy and breastfeeding-** It is not safe to use Sarpagandha during pregnancy as the chemicals present in the medicine may lead to birth defects. These chemicals can also enter the breast milk and might harm the baby.
- **Gall stones-** Sarpagandha is not recommended if you have gall stones, as it might worsen the condition.
- **Stomach ulcers and ulcerative colitis-** Sarpagandha is contraindicated in these conditions as they could make the condition worse.
- **Allergy to alkaline reserpine-** Sarpagandha is not advised if you are allergic to reserpine or similar medications.
- **Electroconvulsive therapy-** It is essential to stop taking Sarpagandha a week before initiating electroconvulsive therapy.
- **Surgery-** It is claimed that Sarpagandha will interfere with surgical procedures by elevating blood pressure and heart rate. Therefore, it is essential to stop taking the medicine at least 2 weeks before a planned surgery.
- **Depression-** Sarpagandha can lead to depression, particularly in individuals who have previously suffered from depression.
- **Diabetes:** Blood sugar levels can be reduced by using Indian snakeroot. When combined with other diabetes medications, it may cause blood sugar levels to drop too low.

References:

1. Mohammad Asad, S. Dwivedi* and S.K. Jain* , Case study Compatibility of Terminalia arjuna (Roxb.) Wight & Arn. with common cardiovascular drugs, Annals of Phytomedicine 5(2): 45-49, 2016,
2. Subir K. Maulik1 and Kewal K. Talwar2, Therapeutic Potential of Terminalia Arjuna in Cardiovascular Disorders , Am J Cardiovasc Drugs 2012; 12 (3): 157-163
3. JM Mane* , JS Jagtap, SS Chitlange, DH Nagore , Nardostachys jatamansi: A Review on Extraction Isolation Bioactivities of Phytoconstituents Chemical Structures and Traditional Uses, IJPQA, Volume 15 Issue 1, January - March 2024 page no.474-484
4. Hari Khanal, Ram Kishor Joshi, Abhishek Upadhyay, Anti- hypertensive activity of Ayurvedic medicinal plants, Int J Complement Alt Med. 2020;13(1):7–12
5. Asha Kesari, Herbal Anti Hypertension Drugs, PharmaTutor; 2014; 2(12); 49-61
6. Gunjan G. Hedaoo, Dr. S. M. Mular and Dr. Z. H. Khan*, EXTRACTION AND PHYTOCHEMICAL ANALYSIS OF TERMINALIA ARJUNA, ejbps, 2016, Volume 3, Issue 5, 507-509
7. Sulaiman C. T.* , Jyothi C.K., Jinu Krishnan Unnithan, Prabhukumar K.M. and Indira Balachandran , Identification of suitable substitute for Sarpagandha (Rauvolfia serpentina (L.) Benth. ex Kurz) by phytochemical and pharmacological evaluation, C. T. et al. Beni-Suef University Journal of Basic and Applied Sciences (2020) 9:42