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## A COMPARATIVE STUDY ON THE EFFICACY, SAFETY AND COST EFFECTIVENESS OF *VISNUM ALBUM* AND *RAUWOLFIA SERPENTINA* MOTHER TINCTURE IN HYPERTENSIVE PATIENTS

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### ABSTRACT

#### Keywords:

*Viscum album*, *Rauwolfia serpentina*, cost effectiveness, blood pressure

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Widely increasing prevalence of hypertension is a new herald for upcoming non-communicable lifestyle disorders like cardiovascular diseases. Newer incidences of freshly occurring cases in youth will be the big catastrophic strategy for upcoming years in medical and pharmaceutical world. Ever increasing cost of treatment in conventional medicine brings enormous burden over economy and budget. Offering few options to the treatment and management; alternative and complementary system of medicine found some good maladies to put forward the efficacious and safe replacement or application in conjunction to modern medicine to give better quality of life.

The study was designed to compare the effect of *Viscum album* and *Rauwolfia serpentina* in hypertensive cases. It was carried over 206 patients during the period of 8-weeks. At the end of study significant reduction in blood pressure from baseline was seen with minimal adverse events. Both the treatments were generally well tolerated. *Viscum album* found safe but lesser cost effective than *Rauwolfia serpentina* and vice a versa. Minimum and maximum reduction in systolic and diastolic pressure was well achieved by *Rauwolfia serpentina*. Pharmacoeconomic analysis showed proper comparison between beneficence of two prescribed medicines in study.

**Introduction:**

Approximately 1 billion people worldwide have high blood pressure, and this number is expected to increase to 1.56 billion people by the year 2025. Hypertension is prevalent in developing as well as in developed countries. Prolonged uncontrolled or inadequate treatment of hypertension is a major risk factor for the occurrence of heart attack, cerebrovascular accidents, renal failure and other cardiovascular diseases. In India community surveys have documented that between three and six decades, prevalence of hypertension has increased by about 30 times among urban dwellers and by about 10 times among the rural inhabitants. That translates to about 1 out of every 4 adults being afflicted with hypertension [1].

Patients with high blood pressure wonder if there is one particular medication option that is better than the others. Adequate control of high blood pressure depends on a wide variety of patient specific factors [2]. Among the all treatment modalities available in market; herbal and homeopathic drugs also showed a good option for combination therapy. Homeopathic mother tinctures like *Rauwolfia serpentina* Linn, and *Viscum album* Var, have established clinically better quality of antihypertensive potential [3]. Singular effect of administration of both agents in clinical hypertension is already proved but cost effective analysis was not compared for replacement over one

another in choice of treatment. In this study effect of *Viscum album* has been compared to that of *Rauwolfia serpentina* in hypertensive patients in India [4-6].

**Material and Methods:****Study design:**

This interventional 8-week randomized open labeled parallel group study was conducted at Bharati Vidyapeeth Deemed University's Medical College and Hospital, Research centre, in Pune city. The study was carried out from June to December 2010. The protocol was approved by institutional ethics committee (IEC). Informed consent was obtained from patients prior to the conduct of study.

**Patient Selection:**

Inclusion and exclusion criteria are mentioned below.

**Inclusion criteria:**

Following patients were included in the study:

Newly diagnosed cases of mild hypertension were included in the study. Patients with moderate and severe hypertension were allowed to take their ongoing antihypertensive medications; along with homeopathic mother tinctures.

- 1) Age 40 years or more from both sexes.

- 2) Patients with all grades of hypertension including mild, moderate and severe. According to {[ICSI, Health Care Guideline]: Hypertension Diagnosis and Treatment}
- 3) Diagnosed cases of primary hypertension.

**Exclusion criteria:**

- 1) Patients with anticipated alteration of ongoing therapy with agents that could interact with the study medication.
- 2) Critically ill patient with complication of hypertension.
- 3) Pregnant and lactating females.
- 4) Troublesome menopausal syndrome.

**Table 1: Patient characteristics (n=200)**

Characteristics		Drugs	
		Viscum album	Rauwolfia serpentina
Number of patients		98	102
Age		45.60±2.60	48.65±2.07
Gender	Male	42 (42.86)	65(63.73)
	Female	56 (57.14)	37(36.27)
	Family history of hypertension in	14 (14.29)	20(19.61)
Diagnosis of study	Mild	82 (83.67)	89(87.25)
	Moderate	9 (9.18)	10(9.80)
	Severe	7 (7.14)	3(2.94)
Medical history	Hyperlipidemia	30 (30.61)	43(42.16)
	Diabetes mellitus	12 (12.24)	9(8.82)
Social history	Smoking	35 (35.71)	23(22.55)
	Alcoholism	13 (13.27)	12(11.76)
	Rich food	30 (30.61)	24(23.53)
	Stress	56 (57.14)	40(39.22)
	Menopause	34 (34.69)	45(44.12)

**Study visits and treatment schedule:**

On the basis of inclusion and exclusion criteria 206 patients were selected during the study period. At the baseline visit apart from the personal characteristics blood pressure was measured with

mercury sphygmomanometer (Diamond-mercurial BP apparatus, 120 Apr-0901483). The patients were randomized in to two groups (according to their economical status) to receive either *Viscum album* (10 drops- Morning and Evening) (Group A) or *Rauwolfia*

*serpentina* (Group B). Initial readings were considered as baseline, first review values were taken at the end of first week. At the end of third and eighth week second and third review values were taken respectively. Participants on baseline were advised to take medication according to treatment regimen. The participants were recalled at first, third

and eighth week for follow up evaluation. The baseline assessment included measurement of blood pressure and heart rate, clinical examination of all systems. These assessments were also done at first, third and eighth week follow up. Adverse drug reactions (ADRs) reported by patients were noted. (Table 2)

**Table 2: Adverse drug reactions**

Adverse drug reaction	% patients ( n= 200 )	
	Viscum album (Group A)	Rauwolfia serpentina(Group B)
Tremors	-	20
Nervousness	-	14
Hypotension	12	18
Giddiness	1	5
Vertigo	1	2
Nausea and vomiting	2	-
Gastric burning	-	-
Redness of eyes	-	10
Sleeplessness	-	2
Drowsiness	3	20
Headache	-	1
Constipation	-	1

### Intervention:

Following Interventions were carried out:

- 1) *Viscum album* mother tincture to be taken twice daily (morning and evening) at the rate of 10 drops to be dissolved in 250ml of drinking water [7]. Each bottle of mother tincture contains 30ml of *Viscum album* priced at RS. 375.00/-. Every bottle contains approximately 600 minims.
- 2) *Rauwolfia serpentina* mother tincture to be taken twice daily (morning and evening) at the rate of 10 drops to be dissolved in 250ml of drinking water [7]. Each bottle of mother tincture contains 30ml of *Rauwolfia serpentina* priced at RS. 425.35/-. Every bottle contains approximately 600 minims.

**Pharmacoeconomic analysis:**

Main types of cost analysis include cost-of-illness analysis, cost-minimisation analysis, cost effectiveness analysis (CEA), cost-utility analysis (CUA), cost-consequence analysis, and cost-benefit analysis (CBA).

**Cost-effectiveness analysis:**

The cost-effectiveness was calculated and the two interventions were compared on the basis of amount needed to treat the patient. Initially for both the medications one day cost was calculated then the annual cost was calculated. Annual cost was divided by the minimum BP reduction value (mmHg)

and maximum BP reduction value (mmHg) to find the cost effective range for both the medicines.

**Statistics:**

Data were expressed as mean  $\pm$  standard error mean (SEM). Data analysis was performed using Graph Pad Prism 5.0 software (Graph Pad, San Diego, CA, USA). The values of blood pressure for each group were analysed by analysis of variance (ANOVA). All figures at particular time point were evaluated by Dunnett's multiple comparison test. Comparison was made between baseline and treatment group.  $p < 0.05$  considered as significant.

**Results:****Table 3: Change in the blood pressure**

Parameter	Drug	Diagnosis	Reviews			
			Baseline	First review	Second review	Third review
Blood pressure (in mmHg)	Viscum album	Mild	136.9 $\pm$ 0.67/88.2 $\pm$ 1.38	132 $\pm$ 0.47/84.4 $\pm$ 0.40*	122 $\pm$ 0.47/80.60 $\pm$ 0.30*	114 $\pm$ 1.90/73 $\pm$ 0.33*
		Moderate	150 $\pm$ 0.65/98 $\pm$ 0.1.20	144 $\pm$ 0.64/96 $\pm$ 0.45	136 $\pm$ 0.36/90 $\pm$ 0.1.09*	130 $\pm$ 0.45/82 $\pm$ 0.48*
		Severe	172 $\pm$ 0.23/110 $\pm$ 0.33	168 $\pm$ 0.43/104 $\pm$ 0.43	160 $\pm$ 0.43/98 $\pm$ 0.54*	158 $\pm$ 0.33/92 $\pm$ 0.67*
	Rauwolfia serpentina	Mild	134.1 $\pm$ 0.32/90 $\pm$ 0.43	130 $\pm$ 0.56/86 $\pm$ 0.25*	120 $\pm$ 0.48/80 $\pm$ 0.28*	104 $\pm$ 0.35/68 $\pm$ 0.27*
		Moderate	154 $\pm$ 0.36/96 $\pm$ 0.47	148 $\pm$ 0.37/90 $\pm$ 0.87*	140 $\pm$ 1.67/82 $\pm$ 0.57*	124 $\pm$ 0.29/72 $\pm$ 0.12*
		Severe	178 $\pm$ 1.95/112 $\pm$ 1.26	178 $\pm$ 1.95/94 $\pm$ 0.25*	172 $\pm$ 1.38/92 $\pm$ 1.96*	168 $\pm$ 1.09/90 $\pm$ 0.98*
*p < 0.001. when compared with baseline figures (ANOVA followed by Dunnett's multiple comparison test)						

In *Viscum album* group the study was completed by 98 out of 103(95.14% ) patients and by 102 out of 103( 99.02%) in *Rauwolfia serpentina* treatment group. Therefore study was completed by 200 patients. The vital characteristics of the patients were given in **Table no.1**. Both

mother tinctures were significantly reduced blood pressure. In *Viscum album* and *Rauwolfia serpentina* group minimum reduction in systolic/diastolic blood pressure was 6/2 and 12/8 and maximum was 10/10 and 16/12 respectively (Table 4).

**Table 4: Cost effective analysis of *Viscum album* and *Rauwolfia serpentina***

Treatment	Minims per bottle	Days per bottle	Annual usage (Bottles per year)	Bottle cost (Rs. Per bottle)	Annual cost	Minimum BP reduction value (mmHg)	Maximum BP reduction value (mmHg)	Cost-effectiveness range (Rs./mmHg decrease in BP)
<i>Viscum album</i>	600	25	14.6	375.00	5475.00	6/2	12/8	456.25/684.37-912.5/2737.5
<i>Rauwolfia serpentina</i>	600	25	14.6	425.35	6210.11	10/10	16/12	388.13/517.50-621.0/621.0
BP- Blood pressure.								

The figures stated that for severe blood pressure *Viscum album* was decreased rise in blood pressure insignificantly at first review. On the other hand *Rauwolfia serpentina* was able to decrease blood pressure significantly in all the cases and at all the review. The *Rauwolfia serpentina* was found to be more cost effective than *Viscum album* (Table 4).

#### Discussion:

In this study, blood pressure was reduced significantly with both the medicines. However maximum efficacy is seen in *Rauwolfia serpentina* but with more number of adverse events than

*Viscum album*. Previous studies shown that *Rauwolfia serpentina* was cost effective and efficacious in prolong treatment<sup>[8-10]</sup>. Our study analysis found that *Viscum album* is much safe to administer but less cost beneficial than *Rauwolfia serpentina*. Besides herbal and homeopathic medicines several options available as treatment modalities out of which most popular is the conventional medicine which is already proved safe and efficacious by variety of clinical trials<sup>[8]</sup>. As compared to them homeopathic mother tinctures were also found useful in hypertensive cases. Along with prevalence of hypertension significant background characteristics like hyperlipidemia and diabetes mellitus

were also seen as emerging risk factors. Not only lifestyle mutations but also social factors such as smoking, alcohol, stress etc. were found contributed to the disease prognosis <sup>[11]</sup>. Our results were irrespective of these lifestyle modifications and correction in these confounding factors.

### Conclusion:

From the present study it has been concluded that *Rauwolfia serpentina* mother tincture was more cost effective than *Viscum album* mother tincture but it cannot be used more safely than *Viscum album* in hypertension.

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