



# International Journal of Homoeopathic Sciences

E-ISSN: 2616-4493  
P-ISSN: 2616-4485  
[www.homoeopathicjournal.com](http://www.homoeopathicjournal.com)  
IJHS 2021; 5(1): 35-41  
Received: 22-11-2020  
Accepted: 24-12-2020

**Feba Mary Johnson**  
IV BHMS, Alva's  
Homoeopathic Medical  
College, Mijar, Moodbidri,  
Karnataka, India

**Maria Dhivya**  
Assistant Professor and  
Research Co-Ordinator,  
Department of Homoeopathic  
Pharmacy, Alva's  
Homoeopathic Medical  
College, Mijar, Moodbidri,  
Karnataka, India

**Herald Roshan Pinto**  
Vice Principal and Professor,  
Department of Organon of  
Medicine and Homeopathic  
Philosophy, Alva's  
Homoeopathic Medical  
College, Mijar, Moodbidri,  
Karnataka, India

**Corresponding Author:**  
**Maria Dhivya**  
Assistant Professor and  
Research Co-ordinator,  
Department of Homoeopathic  
Pharmacy, Alva's  
Homoeopathic Medical  
College, Mijar, Moodbidri,  
Karnataka, India

## Investigating the action of *Rauwolfia serpentina* $\Theta$ , 6C and 30C on blood pressure in healthy individuals

**Feba Mary Johnson, Maria Dhivya and Herald Roshan Pinto**

### Abstract

Hypertension is emerging as a threat due to modern sedentary life style. This study is to analyze and evaluate the action of *Rauwolfia serpentina*  $\Theta$ , 6C and 30C on blood pressure in relation to time span.

Selection of 100 volunteers was done based on inclusion and exclusion criteria and randomly divided into 4 groups of 25. The normal blood pressure was first observed and water dose of placebo and medicine was administered. 10 drops of rectified spirit,  $\Theta$ , 6, and 30 was added in 1 glass of water for control,  $\Theta$ , 6 and 30 groups respectively. After the administration, the blood pressure was recorded mechanically every 30 minutes for 3 hours using sphygmomanometer. The readings were tabulated and analyzed using MANOVA.

It was observed that there was a significant decrease in systolic and diastolic blood pressure in case of *Rauwolfia serpentina*  $\Theta$  and *Rauwolfia serpentina* 30.

**Keywords:** Systolic blood pressure, diastolic blood pressure, homoeopathic medicine, *Rauwolfia serpentina*  $\Theta$ , 6, and 30

### 1. Introduction

Hypertension or High Blood Pressure is one of the most common worldwide disease afflicting humans [3]. According to the WHO, it is a major cause of premature death worldwide, with upwards of 1 in 4 men and 1 in 5 women – over a billion people – affected by the condition [4]. In India, 207 million persons (men 112 million, women 95 million) are diagnosed with hypertension [5]. If not controlled, it may lead to other wide range of complications involving multiple systems of the body such as myocardial infarction, vascular disease and chronic kidney disease [1, 6].

*Rauwolfia serpentina* is one of the homoeopathic drugs used for effective treatment of hypertension [7]. It is also a traditional Ayurvedic and Allopathic drug for hypertension, anxiety and insomnia [8-11]. In later, due to its adverse side effects of cancer and depression, the utility is reduced [6]. In the administration of physiological dose of Reserpine, an alkaloid extracted from *Rauwolfia serpentina*, it was found that the effects extended to nasal congestion, affection of central nervous system, affection of respiratory system in newborns in case of administration of Reserpine in third trimester, etc. [11-14].

*Rauwolfia serpentina*  $\Theta$  has proved to be effective in the treatment of hypertension by its physiological action. It is being clinically administered by homeopathic physicians in the form of  $\Theta$  [7, 15]. However, the mother tincture is a physiological dose [16]. The adverse effects of *Rauwolfia serpentina* in physiological dose has been cited above. The same may transpire in case of homoeopathic mother tinctures. To avoid any such complications, it is important to know more about its dynamic curative action of *Rauwolfia serpentina* in the potentized form [17].

The action of *Rauwolfia serpentina* (non-homeopathically) has proved to lower diastolic blood pressure up to 10 mm Hg and systolic blood pressure to 16 mm Hg in crude form [18]. It is mentioned that *Allium sativum* lowers blood pressure in 30-45 minutes [7]. Such data are not available in regard to *Rauwolfia serpentina*.

So, this study was done to evaluate the physiological and dynamic action of *Rauwolfia serpentina* on blood pressure with respect to time.

### 2. Materials and Methods

Ethical committee clearance was obtained from institutional ethical committee, prior to the start of the study. Selection of volunteers was based on inclusion and exclusion criteria after obtaining informed consent form signed according to WHO guidelines.

The volunteers were randomly divided into 4 groups with 25 in each.

Group A – Negative control group

Group B – *Rauwolfia serpentina*  $\Theta$

Group C – *Rauwolfia serpentina* 6

Group D – *Rauwolfia serpentina* 30

The normal Blood Pressure of the volunteers was first recorded. The remedy was then administered in the form of water dose. 10 drops of rectified spirit,  $\Theta$ , 6, and 30 was added in 1 glass of water for control, *Rauwolfia serpentina*  $\Theta$ , *Rauwolfia serpentina* 6 and *Rauwolfia serpentina* 30 groups respectively. After the administration, the blood pressure was recorded in lying down posture mechanically

every 30 minutes for 3 hours using sphygmomanometer. The procedure was repeated in a total of 100 volunteers. The readings were tabulated.

### 2.1 Inclusive Criteria

- Volunteers with normal range of blood pressure.
- Age group: 18-40 years

### 2.2 Exclusive Criteria

- With any underlying disease.
- On any medication.

## 3. Results and Discussions

### 3.1 Observations

**Table 1: Group A: Negative Control Group (BP analysis)**

0 Min		30 Min		60 Min		90 Min		120 Min		150 Min		180 Min	
100	70	100	60	110	70	110	70	110	70	110	70	110	80
120	80	120	80	110	80	110	80	110	80	110	70	110	70
110	70	110	70	110	70	110	70	110	70	110	70	110	70
120	90	120	80	110	90	120	80	120	70	120	80	120	80
118	80	120	80	116	80	118	80	120	80	116	80	118	80
120	80	120	80	120	80	120	80	120	80	120	80	120	80
100	70	100	70	100	70	100	80	100	70	100	70	100	70
120	80	120	80	120	80	120	70	120	80	120	80	120	80
120	78	120	80	120	80	120	80	130	78	120	78	120	80
110	80	110	80	110	70	118	80	110	80	110	80	110	80
100	80	90	60	100	90	100	80	110	70	100	70	100	70
110	80	114	90	114	80	110	70	100	80	108	78	110	80
116	70	118	80	120	80	116	80	118	70	120	78	100	78
118	80	114	90	116	70	120	70	118	70	118	80	120	90
90	60	90	60	90	80	90	80	98	70	100	80	98	76
100	70	100	70	100	80	100	70	100	70	110	70	100	70
130	80	118	80	128	72	124	70	120	82	120	84	118	82
118	90	120	70	118	66	118	88	120	78	118	80	110	78
110	70	100	60	94	70	90	70	100	70	100	70	100	80
100	70	100	60	100	60	100	60	100	70	100	70	100	70
90	60	100	60	94	80	90	70	98	64	100	82	104	80
120	90	120	90	120	80	120	66	120	80	120	70	120	80
118	70	120	90	122	80	120	90	122	80	118	78	120	84
130	90	118	80	110	80	120	78	110	70	108	82	120	82
120	60	110	70	108	62	100	80	114	80	110	80	118	70

**Group B: *Rauwolfia serpentina*  $\Theta$  (BP analysis)**

0 Min		30 Min		60 Min		90 Min		120 Min		150 Min		180 Min	
120	80	110	70	110	68	106	68	100	60	107	76	108	70
120	80	120	80	110	70	110	70	110	70	110	80	110	70
120	90	120	90	108	78	108	80	112	80	104	80	104	80
120	80	110	78	120	80	116	78	108	84	110	82	110	78
120	80	110	78	110	80	108	70	100	70	100	70	108	74
110	80	130	80	110	80	110	72	116	78	110	80	110	78
120	80	110	70	100	70	100	70	100	70	110	70	120	70
120	80	120	80	110	78	110	80	108	78	110	78	114	80
120	80	110	80	108	70	100	60	102	70	104	70	116	70
110	78	108	70	94	80	94	80	88	76	90	70	94	80
106	68	108	70	98	66	98	70	102	70	104	70	92	74
110	80	118	80	108	80	108	78	90	70	80	64	80	60
140	80	130	70	120	60	110	70	110	80	108	70	108	70
122	78	110	60	120	80	118	70	110	70	120	90	104	76
110	80	100	80	118	72	110	70	100	72	100	70	100	70
120	80	118	78	110	70	118	70	122	78	118	78	108	78
120	90	120	72	100	70	100	80	110	80	110	70	100	70
122	80	110	80	100	70	100	70	94	76	94	70	100	80
140	90	110	80	100	70	100	70	104	60	90	66	100	64
100	70	90	60	84	68	90	68	88	60	90	70	90	60
118	90	110	80	108	80	100	80	104	66	106	70	100	68

110	70	100	70	110	70	108	70	96	62	100	62	98	66
110	80	110	90	110	70	108	82	98	64	108	74	98	78
110	70	100	60	122	80	102	66	98	70	98	62	96	68
126	78	118	70	118	70	118	70	112	80	114	78	108	70

**Group C: Rauwolfia serpentina 6C (BP analysis)**

0 Min		30 Min		60 Min		90 Min		120 Min		150 Min		180 Min	
120	80	112	78	126	80	128	90	108	80	118	98	110	90
110	80	120	90	94	70	82	60	88	70	96	62	92	74
110	70	114	86	98	78	98	66	98	60	110	70	110	70
120	80	116	82	112	80	108	78	108	64	112	70	120	70
110	70	106	78	108	80	106	80	108	60	104	68	110	80
120	80	110	78	110	80	110	60	106	78	98	68	120	80
110	60	98	82	102	72	108	64	108	76	108	68	102	80
110	90	110	60	108	88	108	78	106	64	110	70	110	70
110	70	104	76	92	64	100	68	94	64	94	68	110	80
110	80	108	80	96	68	108	70	110	80	110	80	108	70
120	70	118	68	112	70	122	68	110	80	120	78	118	80
120	80	118	80	130	100	130	100	120	94	118	78	120	68
110	80	110	80	120	90	110	70	98	70	98	70	110	80
100	70	120	80	110	80	100	90	102	70	106	70	100	80
120	90	120	90	110	80	108	80	106	70	110	80	120	70
130	80	118	80	120	90	118	80	120	94	118	78	120	80
110	80	118	80	118	78	100	80	108	76	108	78	110	80
130	90	120	90	120	80	110	80	110	80	110	80	110	80
110	80	110	80	110	80	120	70	118	82	110	80	110	80
120	80	108	78	106	70	108	80	100	70	80	62	100	80
118	70	118	70	118	70	118	70	120	80	126	80	108	76
110	70	100	60	100	70	110	70	118	80	110	70	104	70
100	70	110	70	100	70	110	80	110	70	110	74	98	68
110	80	110	70	110	70	106	58	110	70	110	70	110	78
122	86	110	70	100	70	122	66	110	70	110	80	120	80

**Group D: Rauwolfia serpentina 30C (BP analysis)**

0 Min		30 Min		60 Min		90 Min		120 Min		150 Min		180 Min	
120	70	118	68	96	60	106	72	106	72	110	70	110	80
100	60	110	70	118	80	116	64	110	70	110	70	110	70
124	80	118	88	104	72	110	72	112	74	110	70	110	70
120	98	110	82	102	76	92	64	100	70	110	80	114	80
114	72	98	68	92	64	108	78	108	88	108	80	110	80
120	80	116	80	110	82	108	88	110	80	120	100	120	90
120	80	114	82	110	80	94	72	100	80	110	80	114	82
120	88	118	90	120	80	114	72	118	84	112	78	124	86
110	70	100	58	100	70	104	66	92	60	96	62	100	60
120	90	104	68	96	56	108	56	102	62	110	68	120	60
120	70	108	70	116	76	102	52	102	74	104	66	100	66
110	70	114	78	106	68	108	64	100	60	102	72	112	72
114	90	100	70	104	68	96	68	92	54	102	72	112	80
120	80	118	68	108	68	108	66	108	58	108	68	108	78
120	70	118	78	98	68	116	76	108	76	112	72	118	89
120	70	108	68	100	60	88	50	112	64	108	58	100	58
120	78	118	80	114	76	106	76	114	66	118	88	114	84
108	68	98	54	102	66	96	58	90	54	100	64	90	52
110	70	105	60	108	72	90	60	108	68	112	62	110	72
130	90	110	80	112	80	118	80	108	80	102	78	100	78
130	90	100	82	110	90	100	80	110	90	104	78	102	70
120	90	100	70	108	80	100	74	104	74	106	80	104	74
110	80	108	70	120	80	116	86	110	70	108	70	110	80
130	90	110	94	120	90	120	80	118	80	118	80	110	80
120	80	114	70	118	78	122	72	118	72	122	68	110	70

### 3.2 Stastical Analysis

MANOVA was used to analyse the data obtained.

**Table 2: Multivariate Tests <sup>a</sup>**

Effect		Value	F	Hypothesis df	Error df	Sig.	
Between Subjects	Intercept	Pillai's Trace	.997	94.000	.000 <sup>b</sup>	94.000	.000 <sup>b</sup>
		Wilks' Lambda	.003	94.000	.000 <sup>b</sup>	94.000	.000 <sup>b</sup>
		Hotelling's Trace	349.276	94.000	.000 <sup>b</sup>	94.000	.000 <sup>b</sup>
		Roy's Largest Root	349.276	94.000	.000 <sup>b</sup>	94.000	.000 <sup>b</sup>
	group	Pillai's Trace	.143	288.000	.113	288.000	.113
		Wilks' Lambda	.861	228.922	.112	228.922	.112
		Hotelling's Trace	.157	278.000	.110	278.000	.110
		Roy's Largest Root	.115	96.000	.014 <sup>c</sup>	96.000	.014 <sup>c</sup>
Within Subjects	time	Pillai's Trace	.644	79.000	.000 <sup>b</sup>	79.000	.000 <sup>b</sup>
		Wilks' Lambda	.356	79.000	.000 <sup>b</sup>	79.000	.000 <sup>b</sup>
		Hotelling's Trace	1.813	79.000	.000 <sup>b</sup>	79.000	.000 <sup>b</sup>
		Roy's Largest Root	1.813	79.000	.000 <sup>b</sup>	79.000	.000 <sup>b</sup>
	time * group	Pillai's Trace	.840	243.000	.002	243.000	.002
		Wilks' Lambda	.358	236.205	.002	236.205	.002
		Hotelling's Trace	1.286	233.000	.001	233.000	.001
		Roy's Largest Root	.731	81.000	.000 <sup>c</sup>	81.000	.000 <sup>c</sup>

a. Design: Intercept + group  
Within Subjects Design: time

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

**Table 3: Mauchly's Test of Sphericity<sup>a</sup>**

Within Subjects Effect	Measure	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon		
						Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Time	Systolic_BP	.209	146.741	20	.000	.626	.676	.167
	Diastolic_BP	.000	1159.652	20	.000	.186	.193	.167

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.<sup>a</sup>

a. Design: Intercept + group  
Within Subjects Design: time

b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

### 3.3. Tests of Within-Subjects Effects

**Table 4: Multivariate <sup>a, b</sup>**

Within Subjects Effect		Value	F	Hypothesis df	Error df	Sig.
time	Pillai's Trace	.170	5.765	18.000	1728.000	.000
	Wilks' Lambda	.833	6.014	18.000	1624.002	.000
	Hotelling's Trace	.197	6.252	18.000	1718.000	.000
	Roy's Largest Root	.176	16.857 <sup>c</sup>	6.000	576.000	.000
time * group	Pillai's Trace	.147	1.645	54.000	1728.000	.002
	Wilks' Lambda	.859	1.655	54.000	1711.110	.002
	Hotelling's Trace	.157	1.664	54.000	1718.000	.002
	Roy's Largest Root	.096	3.072 <sup>c</sup>	18.000	576.000	.000

a. Design: Intercept + group  
Within Subjects Design: time

b. Tests are based on averaged variables.

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

**Table 5: Univariate Tests**

Source	Measure	Type III Sum of Squares	df	Mean Square	F	Sig.	
Time	Systolic BP	Sphericity Assumed	4844.369	6	807.395	16.373	.000
		Greenhouse-Geisser	4844.369	3.759	1288.864	16.373	.000
		Huynh-Feldt	4844.369	4.053	1195.226	16.373	.000
		Lower-bound	4844.369	1.000	4844.369	16.373	.000
	Diastolic BP	Sphericity Assumed	2906.334	6	484.389	.753	.607
		Greenhouse-Geisser	2906.334	1.117	2601.841	.753	.401
		Huynh-Feldt	2906.334	1.156	2513.711	.753	.406
		Lower-bound	2906.334	1.000	2906.334	.753	.388
Time * group	Systolic BP	Sphericity Assumed	2520.523	18	140.029	2.840	.000
		Greenhouse-Geisser	2520.523	11.276	223.532	2.840	.001

	Diastolic BP	Huynh-Feldt	2520.523	12.159	207.292	2.840	.001
		Lower-bound	2520.523	3.000	840.174	2.840	.042
		Sphericity Assumed	11726.934	18	651.496	1.013	.443
		Greenhouse-Geisser	11726.934	3.351	3499.439	1.013	.396
		Huynh-Feldt	11726.934	3.469	3380.905	1.013	.397
		Lower-bound	11726.934	3.000	3908.978	1.013	.391
Error (time)	Systolic BP	Sphericity Assumed	28403.680	576	49.312		
		Greenhouse-Geisser	28403.680	360.829	78.718		
		Huynh-Feldt	28403.680	389.098	72.999		
		Lower-bound	28403.680	96.000	295.872		
Error(time)	Diastolic BP	Sphericity Assumed	370531.017	576	643.283		
		Greenhouse-Geisser	370531.017	107.235	3455.322		
		Huynh-Feldt	370531.017	110.995	3338.282		
		Lower-bound	370531.017	96.000	3859.698		

**Table 6:** Tests of Within-Subjects Contrasts

Source	Measure	time	Type III Sum of Squares	df	Mean Square	F	Sig.
Time	Systolic BP	Linear	2740.321	1	2740.321	45.820	.000
		Quadratic	1794.039	1	1794.039	33.814	.000
		Cubic	213.607	1	213.607	5.428	.022
		Order 4	46.695	1	46.695	.667	.416
		Order 5	47.852	1	47.852	.973	.326
		Order 6	1.855	1	1.855	.076	.784
	Diastolic BP	Linear	145.829	1	145.829	.732	.394
		Quadratic	133.510	1	133.510	.269	.605
		Cubic	614.082	1	614.082	.845	.360
		Order 4	25.528	1	25.528	.454	.502
		Order 5	664.734	1	664.734	.504	.480
		Order 6	1322.652	1	1322.652	1.246	.267
	Systolic BP	Linear	1486.119	3	495.373	8.283	.000
		Quadratic	623.720	3	207.907	3.919	.011
		Cubic	149.127	3	49.709	1.263	.291
		Order 4	60.090	3	20.030	.286	.835
		Order 5	147.095	3	49.032	.997	.398
		Order 6	54.373	3	18.124	.739	.531
	Diastolic BP	Linear	297.955	3	99.318	.499	.684
		Quadratic	1446.247	3	482.082	.972	.409
		Cubic	3248.565	3	1082.855	1.490	.222
		Order 4	99.801	3	33.267	.592	.622
		Order 5	4003.975	3	1334.658	1.011	.391
		Order 6	2630.391	3	876.797	.826	.483
	Systolic BP	Linear	5741.417	96	59.806		
		Quadratic	5093.432	96	53.057		
		Cubic	3777.600	96	39.350		
		Order 4	6718.267	96	69.982		
		Order 5	4719.863	96	49.165		
		Order 6	2353.101	96	24.511		
Diastolic BP	Linear	19121.394	96	199.181			
	Quadratic	47617.589	96	496.017			
	Cubic	69785.520	96	726.933			
	Order 4	5394.833	96	56.196			
	Order 5	126692.446	96	1319.713			
	Order 6	101919.235	96	1061.659			

**Table 7:** Tests of Between-Subjects Effects

Transformed Variable: Average						
Source	Measure	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	Systolic BP	8394489.051	1	8394489.051	24152.864	.000
	Diastolic BP	4012705.716	1	4012705.716	5076.192	.000
Group	Systolic BP	1530.937	3	510.312	1.468	.228
	Diastolic BP	1383.456	3	461.152	.583	.627
Error	Systolic BP	33365.440	96	347.557		
	Diastolic BP	75887.543	96	790.495		

## 3.4 Estimated Marginal Means

Table 8: 3. Group \* time

Measure	Group	Time	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
Systolic BP	negative control group	1	112.320	1.783	108.780	115.860
		2	110.880	2.631	105.657	116.103
		3	110.400	1.875	106.678	114.122
		4	110.560	1.934	106.721	114.399
		5	111.920	1.691	108.564	115.276
		6	111.440	1.678	108.110	114.770
		7	111.040	1.644	107.776	114.304
	<i>Rauwolfia serpentina</i> O	1	117.760	1.783	114.220	121.300
		2	108.400	2.631	103.177	113.623
		3	108.240	1.875	104.518	111.962
		4	106.000	1.934	102.161	109.839
		5	103.280	1.691	99.924	106.636
		6	103.800	1.678	100.470	107.130
		7	103.040	1.644	99.776	106.304
	<i>Rauwolfia serpentina</i> 6C	1	114.400	1.783	110.860	117.940
		2	112.240	2.631	107.017	117.463
		3	109.200	1.875	105.478	112.922
		4	109.920	1.934	106.081	113.759
		5	107.760	1.691	104.404	111.116
		6	108.160	1.678	104.830	111.490
		7	110.000	1.644	106.736	113.264
	<i>Rauwolfia serpentina</i> 30C	1	118.000	1.783	114.460	121.540
		2	109.400	2.631	104.177	114.623
		3	107.680	1.875	103.958	111.402
		4	105.840	1.934	102.001	109.679
		5	106.400	1.691	103.044	109.756
		6	108.880	1.678	105.550	112.210
		7	109.280	1.644	106.016	112.544
Diastolic BP	negative control group	1	75.920	1.644	72.657	79.183
		2	74.800	1.832	71.164	78.436
		3	76.000	1.551	72.920	79.080
		4	75.680	1.683	72.338	79.022
		5	74.480	13.064	48.548	100.412
		6	76.400	1.453	73.515	79.285
		7	77.600	1.389	74.844	80.356
	<i>Rauwolfia serpentina</i> O	1	79.680	1.644	76.417	82.943
		2	75.040	1.832	71.404	78.676
		3	73.200	1.551	70.120	76.280
		4	72.480	1.683	69.138	75.822
		5	72.680	13.064	71.748	123.612
		6	72.800	1.453	69.915	75.685
		7	72.080	1.389	69.324	74.836
	<i>Rauwolfia serpentina</i> 6C	1	77.440	1.644	74.177	80.703
		2	77.440	1.832	73.804	81.076
		3	77.120	1.551	74.040	80.200
		4	74.240	1.683	70.898	77.582
		5	74.080	13.064	48.148	100.012
		6	74.000	1.453	71.115	76.885
		7	76.560	1.389	73.804	79.316
	<i>Rauwolfia serpentina</i> 30C	1	78.960	1.644	75.697	82.223
		2	73.840	1.832	70.204	77.476
		3	73.600	1.551	70.520	76.680
		4	69.840	1.683	66.498	73.182
		5	71.200	13.064	45.268	97.132
		6	73.360	1.453	70.475	76.245
		7	74.440	1.389	71.684	77.196

The study shows the following changes in the respective groups.

Group A Negative Control Group: No any significant variations.

Group B *Rauwolfia serpentina* O: Significant decrease in

systolic blood pressure was noted but not in diastolic blood pressure. The lowered systole did not get restored back to normal by the end of 3 hours study time.

Group C *Rauwolfia serpentina* 6C: Systolic blood pressure was lowered by 2 hours after the administration which

returned back to the previous range by the 3rd hour.

Group D *Rauwolfia serpentina* 30C: Decreased diastolic and systolic pressure significantly by 1 hour 30 minutes and the pressure did not re-attain the normal range in the 3rd hour of study.

#### 4. Conclusion

**Systolic Blood Pressure:** The systolic blood pressure was altered by *Rauwolfia serpentina*  $\Theta$  & *Rauwolfia serpentina* 30 significantly. In non-homoeopathic studies by use of Reserpine, the systolic blood pressure was found to be significantly lowered <sup>[19]</sup>.

**Diastolic Blood Pressure:** The diastolic blood pressure was not altered consistently in any of the groups.

So, it is better to administer *Rauwolfia serpentina* in case of systolic hypertension.

#### 4.1 Other observations made during this study

1. Group B participants experienced and complained increased hunger and sleepiness after the study. This can be related to the ayurvedic use of *Rauwolfia serpentina* in treating insomnia <sup>[10]</sup>.
2. Pulse rate of the participants was also lowered during the study as to the lowering of pressure but not significant. This calls for the need of studying the action of *Rauwolfia serpentina* on cardiac functioning. The usage of Reserpine in treatment of tachycardia supports to this statement <sup>[20]</sup>.

#### 5. Acknowledgement

The study has been selected under STSH of CCRH for the year 2019-2020.

#### 6. References

1. *Rauwolfia serpentina* 1X. Schwabe News. Dr. Willmar Schwabe, India Pvt. Ltd., 2018. Available from: [https://www.schwabeindia.com/content/168-rauwolfia-serpentina-1x-2011,2\(5\)](https://www.schwabeindia.com/content/168-rauwolfia-serpentina-1x-2011,2(5)).
2. Sedentary Behavior and Blood Pressure Control among Osteoarthritis Initiative Participants. Min-Woong Sohn, Larry M. Manheim, Rowland W. Chang, Philip Greenland, Marc C Hochberg, Michael C. Nevitt, Pamela A. Semanik, Dorothy D. Dunlop. Osteoarthritis Cartilage. Author manuscript; available in PMC 2015 Sep 1. Published in final edited form as: Osteoarthritis Cartilage 2014;22(9):1234-1240. Published online 2014 Jul 18. doi: 10.1016/j.joca.2014.07.007. PMID:PMC4159385
3. Alexander R Matthew. What is the global impact of hypertension (high blood pressure) on public health? 2019, Available from <https://www.medscape.com/answers/241381-7568/what-is-the-global-impact-of-hypertension-high-blood-pressure-on-public-health>
4. Hypertension. [https://www.who.int/health-topics/hypertension/#tab=tab\\_1](https://www.who.int/health-topics/hypertension/#tab=tab_1)
5. Gupta R, Gaur K, Ram S, CV. Emerging trends in hypertension epidemiology in India. J Hum Hypertens 2019;33:575-587. <https://doi.org/10.1038/s41371-018-0117-3>
6. Douglas Lobay. Rauwolfia in the Treatment of Hypertension. Integr Med (Encinitas) 2015;14(3):40-46 PMID: PMC4566472 PMID: 26770146 Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4566472/>
7. Boericke William. Boericke's New Manual of Homoeopathic Materia Medica with Repertory Including Indian Drugs, Nosodes, Uncommon Rare Remedies, Mother Tinctures, Relationships, Sides of the body, drug Affinities and List of Abbreviations. Third Revised and Augmented Edition based on 9<sup>th</sup> Edition. Pharganj, New Delhi: B. Jain Publishers (P) LTD. 40th impression 2017;26:998,1089
8. Chauhan Meenakshi. Sarpagandha (*Rauwolfia serpentina*) - Uses, Properties, Benefits, Side effects & Dosage. Available from: <https://www.planetaryurveda.com/library/sarpagandha-rauwolfia-serpentina/>
9. Sarpagandha *Rauwolfia serpentina* Uses Side effects - Ayurveda details <https://www.easyayurveda.com/2013/10/18/sarpagandha-rauwolfia-serpentina-benefits-side-effects-ayurveda-details/>
10. Indian Snakeroot. <https://www.webmd.com/vitamins/ai/ingredientmono-787/indian-snakeroot>
11. Reserpine <https://en.wikipedia.org/wiki/Reserpine>
12. Tu Anthony. Handbook of Natural Toxins: Food poisoning. CRC Press 1992. Available from: [https://books.google.co.in/booksid=TmHmKGKr9rUC&pg=PA527&lpg=PA527&dq=Czeizel+1988+rauwolfia&source=bl&ots=kzdS\\_j24sq&sig=ACfU3U2j-catQidawyKyb-HpoRxtS-cNw&hl=en&s](https://books.google.co.in/booksid=TmHmKGKr9rUC&pg=PA527&lpg=PA527&dq=Czeizel+1988+rauwolfia&source=bl&ots=kzdS_j24sq&sig=ACfU3U2j-catQidawyKyb-HpoRxtS-cNw&hl=en&s)
13. Mossoba ME, Flynn TJ, Vohra S *et al.* Human kidney proximal tubule cells are vulnerable to the effects of *Rauwolfia serpentina*. Cell Biol Toxicol 2015;31:285-293. <https://doi.org/10.1007/s10565-016-9311-7>
14. [https://www.rxlist.com/consumer\\_serpasil\\_reserpine/drugs-condition.htm](https://www.rxlist.com/consumer_serpasil_reserpine/drugs-condition.htm)
15. Professor (Dr.) Niranjan Mohanty. All in one Homoeopathic Materia Medica for BHMS Students Ist Year to IVth Year (According to New Syallabus). Revised and Enlarged Edition 2004. Pharganj, New Delhi: B. Jain Publishers (P) Ltd. 14th impression 2015,1198p.
16. Close Stuart. The Genius of Homoeopathy Lectures and Essays on Homoeopathic Philosophy with Word Index. Revised and enlarged version 2005-2006. B. Jain Publishers (P) Ltd. 183-191p.
17. Samuel Hahnemann. Organon of Medicine Word Index Included. 5<sup>th</sup> and 6<sup>th</sup> edition Pharganj, New Delhi: B. Jain Publishers (P) LTD. Reprinted 2007,96, 97, 98p.
18. Smith WM. Treatment of mild hypertension: results of a ten-year intervention trial. Circulation Research 1977;40(5 Suppl 1):I98-105.
19. Prevention of Stroke by Antihypertensive Drug Treatment in Older Persons with Isolated Systolic Hypertension: Final Results of the Systolic Hypertension in the Elderly Program (SHEP). JAMA 1991;265(24):3255-3264. doi:10.1001/jama.1991.03460240051027
20. Jerie P. Milníky kardiiovaskulární terapie. IV. Reserpin [Milestones of cardiovascular therapy. IV. Reserpine]. Cas Lek Cesk 2007;146(7):573-7. Czech. PMID: 17722843