

MANAGEMENT OF RAKTAVATA VIS-A-VIS ARTERIAL HYPERTENSION WITH BRAHMYADI GHANA VATI

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An open case control study comprising of 40 patients suffering from all varieties of essential hypertension having diastolic blood pressure from 96 to 155 mm. Hg. has been carried out. Cases were divided in trial and control groups consisting of 20 patients each. Trial group patients were treated with Brahmyadi Ghana Vati 500 mg. tablet twice daily and control group patients were treated with atenolol 50 mg. tablet twice daily. All patients were advised to curtail their intake of salt and fat. The total effect obtained by Brahmyadi Ghana Vati was 30% marked improvement, 30% moderate improvement, 25% slight improvement and 15% no improvement. Analysis shows that the trial drug is significantly effective to reduce hypertension with P value less than 0.001. The total effect obtained by atenolol treatment was 80% mark improvement and 20% moderate improvement.

Introduction

Arterial hypertension is a very prevalent disease which require long term treatment. Commenting on the alarming state in Western Countries Brawnward (1983) says that hypertension is the greatest silent killer. Only in U.S.A. it contributes half of the total and two thirds of the deaths due to cardiovascular diseases. Similar figures are also reported from other European Countries, Australia and Canada. Owing to lack of comprehensive survey its exact prevalence in India could not be ascertained. However, the figure is estimated about 10-15% of the total population. Basically being a disease of adult population, prevalence of hypertension increases with the increase in life span by economic development and prevention of diseases. A report by W.H.O. reveals, hypertension is at an epidemic

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stage and is developing in such a pace that by the year 2000. The cardiovascular diseases particularly hypertension will be either actively emerging or established in virtually every nation of the third world, accounting for between the 15 to 20% of deaths.

The search for origin of essential hypertension has been most frustrating. Therefore considering the uncertainty of etiology essential hypertension causative factors enunciated in Ayurveda for vitiation of *Vata* and *Rakta* can be considered as contributory risk factors and should not be accepted as specific to intimate the mechanism of pathogenesis of hypertension. In view of Bizarre pattern of description of *Nidan* for vitiation of *Rakta* and *Vata*, the factors can be grouped into the following genetic and environmental categories.

Clarifying the term *Dhamani Pratichaya* included under *Kapha Nanatmaja Vyadhi* by Carak, A.D. Ahwale *et. al.*, assesses that, *Dhamani Pratichaya* is an arterial change invariably takes place in high blood pressure. Commenting on the same world Chakrapani advise that it should be referred to as *Dhamani Upalepa* to which later scholars have interpreted as fullness or thickning of arterial wall due to fatty deposition.

It has also been discussed that excitation of *Vayu* results by *Dhatukshaya* and *Avarana*. Concept of *Avarana* in Ayurveda is an important pathological mechanism, which has been described by Carak and Sushruta in context of

Vatavyadhi and *Vatarakta*. As *Raktavata* falls under *Avarana* category, general causes for excitation of *Vayu* can be considered in its case. Similarly, *Rakta* being the active element responsible for obstruction of *Vayus* pathway, plays an important roll in its pathogenesis. So aetiology for vitiation of *Rakta* appear relevant in relation to causation of *Raktavata*.

Prof. Y.N. Upadhyaya, Deptt. of Kayachikitsa B.H.U. has advised to accept hypertension as *Raktagata Vata* written in Madhava *Nidan* under *Vatavyadhi*. *Raktagata Vata* is a *Nanatmaja Vatavyadhi*, caused by mingling of vitiated *Vata* with pure blood and manifested with symptoms of blood anomalies, mostly due to obliteration of blood circulation by aggravated *Vata*.

Vaidya Brahaspati Dev Triguna of Delhi in 1974 remarked in Delhi Pradeshika Vaidya Sammelana Patrika that hypertension should be expressed on Ayurvedic point of view as *Vyanabala* and accordingly hypertension should be designated as *Ativyanabala* or *Brihat Vyanabala* and hypertension as *Hinavyanabala*. Forwarding some justification to his statement he says with help of *Vyanavayu Rasa* is expelled out from heart during circulation exerts pressure on the walls of vessel. Therefore increase and decrease of *Rasa* pressure solely depends on increase and decrease in force of *Vyanavayu*. He further justifies with citation from texts, when *Vyanavayu* is vitiated by *Kapha* low pressure results. Similarly when *Vyana* becomes disturbed

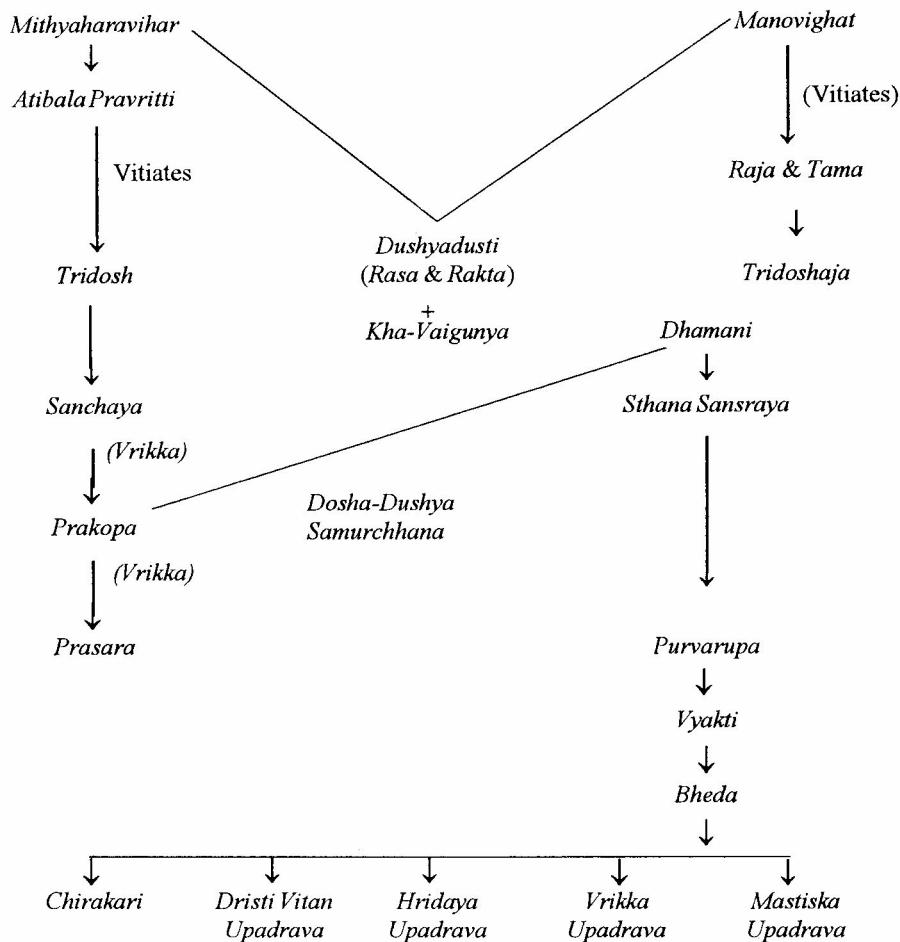
by *Pitta* high arterial pressure occurs. Vaidya Mahabir Prasad in his article *Raktachapa Vimarsa* Published in All India Golden Jubilee Celebration Souvenir (1981) states that *Rasadhikya* and *Rasakshya* should respectively be referred to as hyper and hypotension. Moreover the symptoms described in texts should be accepted in this context as premonitory symptoms of hypertension.

Many scholars such as C.P. Shukla, S.C. Dhyani, D.R. Chaturvedi, B.D. Shastri and P.D. Sharma, deliberating their views in the various seminars on hypertension that from modern side it is not difficult to understand but it is very difficult to put the whole entity of blood pressure and hypertension under a single disease described in Ayurvedic texts. Yawning difference was marked in their opinion on of the diseases from among *Raktabhara*, *Rasabhara*, *Vyanabala*, *Dhamani-Pratichya* and *Raktapitta* etc. as Ayurvedic analogue for hypertension. Through analysis of certain relevant diseases, described in texts, reveals that hypertension comprises a combined concept of various diseases like *Raktavrita Vata*, *Siragata Vata*, *Pittavrita Vata* and *Kaphavrita Vyan* etc. Therefore consideration of hypertension on Ayurvedic fundamentals should be made from its symptomatology and involvement of *Dosha*, *Dusya* and *Srota* etc. on this basis arterial hypertension according to Ayurveda is a *Pitta* predominant *Tridoshaja-Vyadhi* and also in it according to principle of *Ashrayashrayibhava*, because of *Pitta* vitiation. Etiology mentioned for *Raktaja Vyadhi* in *Abadhashomita* chapter of Charak Samhita can be considered as its

causative factors and *Agnimandy*, *Ama*, *Rasarakta*, *Manovaha-Srotorodha*, *Dhamani Upalepa* and excitation of *Vyanavayu* should be considered as main pathological factors involved in its pathogenesis.

As discussed above, *Mithyahar Vihar* and *Manovighata* increasing nerves tension cause excessive secretion of catecholamines specially noradrenaline through corticohypothalamopituitary adrenal cortex. This stimulates secretion of aldosteron by which retention of water and salt takes place. Excitation of above endocrinial axis also gives rise to immediate and prolonged vaso-constriction or *Sira Sankoch*, as a result of which total arteriolar resistance supervenes, providing more resistance to free blood flow. Collectively by increased salt and water volume, peripheral resistance, forcible cardiac contraction and increased cardiac out put, the blood pressure persistently remains elevated.

Since the last few decades, lowering the B.P. with modern therapy has considerably been achieved, the total objectivity to protect endorgan involvement and shortening of life still remains are remote possibility. Moreover, some of the drawbacks with prolonged administration of modern medicines are, in certain cases necessity for intravenous injectability, non-availability, high cost, unpredictable fall of pressure, delayed effect an unwanted sedative action. So, need for an ideal anti-hypertensive drug is felt, which will not only be effective but can be used orally with rapid action and of sufficient duration,

Samprapti of arterial hypertension

and should be cheap, easily available, free from side effects and devoid of tolerance on long term use.

Drug under trial: *Brahmyadi Ghana Vati* constitutes *Brahmi* (*Bacopa monnieri* Linn.), *Vacha* (*Acorus calamus* Linn.), *Kustha* (*Saussurea lappa* C.B. Clarke.), *Sarpagandha* (*Rauvolfia serpentina* Benth. ex Kurz.), *Jatamansi* (*Nardostachys jatamansi* DC.), *Tagarapada* (*Valeriana wallichii* DC.), *Parasika* *Tawani* (*Hyoscyamus niger* Linn.).

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The *Rasa*, *Guna*, *Virya*, *Vipaka*, *Prabhava* and *Doshakarma* of *Brahmyadi Ghana Vati* thus calculated is being discussed here as under:

Rasa: *Brahmyadi Ghana Vati* consist of 100% of *Tiktarasa*, 71.4% *Katurasa*,

42.8% of *Kashayarasa* and 14.3% of *Madhurasa*.

Guna: The dominant properties of *Brahmyadi Ghana Vati* are *Laghu* (71.4%), *Ruksha* (57.1%), *Tikshna* (28.6%), *Snigdha* (28.6%), *Guru* (14.3%).

Virya: *Brahmyadi Ghana Vati* contains mainly *Ushna Virya* (85.7). However, it contains (14.3%) *Shita Virya* also.

Vipaka: It consists 100% of *Katu Vipaka*.

Prabhava: It contains *Medhya* (28.6%), *Madaka* (28.6%), *Vedanasthapaka* (14.3%), *Kusthaghana* (14.3%), *Bhutaghana* and *Manasika Doshahara* (14.3%) respectively.

It is obvious from the foregoing that *Brahmyadi Ghana Vati* is mainly *Tikta* in *Rasa*; *Laghu*, *Ruksha* etc. in *Guna*; *Ushna* in *Virya* and probably it has *Katu* in *Vipaka*. Its *Doshic* action may be considered as *Vatakapha Shamaka* and *Tridoshahara*.

The trial drug *Brahmyadi Ghana Vati* was selected from Ayush. The journal of Central Council for Research in Ayurveda and Siddha, where it had been mentioned that the *Yoga* was trialed for treatment of *Unmada*. While analysing the compound it was detected that its each ingredient has been evaluated on arterial hypertension at one or other centres having been obtained with encouraging results. Expecting a synergistic action the composition was selected for trial. Finding all patients as ambulents *Ghana Vati* form of the *Yoga* was considered convenient for dispensation. *Brahmyadi Ghana Vati* comprises of the following ingredients with their respective proportions, (1) *Brahmi* -

200 gm., (2) *Sarpagandha* - 200 gm., (3) *Jatamansi* - 200 gm., (4) *Tagara* - 200 gm., (5) *Vacha* - 100 gm., (6) *Kustha* - 100 gm., (7) *Khurasani Ajawain* - 50 gm.

The medicine was manufactured and standardised according to *Vati* preparation method in Rasashastra pharmacy deptt., of G.A.M., Puri. Each pill was of 500 mg. weight and the medicine was supplied in a polythene pack containing 30 pills. Each patient was dispensed with one pack for 10 days use. Then the patient was asked to report for 2nd checkup and take delivery of the 2nd pack. This procedure continued till a course of 30 days completed.

Diet and other instructions : Each patient was advised not to intake excess salt or foods with high sodium content. Restriction in intake of cholesterol and saturated fat foods was also imposed. Patients were instructed to give up their habit of smoking, shed off emotional and environmental stress and perform regular exercise and yogic practices.

Materials and Methods

Patients suffering from essential hypertension mostly newly diagnosed and a few known cases who have not undergone regular treatment for their condition. All varieties of essential hypertension classified according to diastolic blood pressure value by W.H.O. as mild, moderate and severe were included in the study. After excluding the mismatched control, drop-outs and cases who did not fulfill the criteria of diagnosis, 40 patients were registered for study. The patients were divided in trial and control group consisting of 20 patients each. Trial group patients

were treated with *Brahmyadi Ghana Vati* 500 mg., tablet twice daily and control group patients were treated with atenolol 50 mg., tablet twice daily. All the patients were advised to curtail their intake of salt and fat. Most cases were ambulatory who preferred domiciliary treatment as our patients. Few severe cases were asked to take admission in hospital, who were apprehended to suffer from any target organ involvement.

Patients were selected according to their B.P. values. Only these patients with a supine diastolic pressure between 96 and 155 mm. of Hg., after a 10 minute rest were selected. B.P. was measured using a mercury manometer, systolic and diastolic pressures being determined by phase I and V of Korotkoff sounds respectively. Patients with malignant hypertension of stage III and IV or liable hypertension were not included in the study.

Criteria of diagnosis : Selected cases were thoroughly examined under a proforma prepared for the purpose. In evaluating patients with hypertension the initial history, physical examination and laboratory tests were directed at, uncovering secondary forms of hypertension establishing a pretreatment baseline, assessing factors which may influence treatment and determining risk factors for development of complications.

Exclusion criteria were secondary hypertension, cardiac failure, confirmed renal failure, severe hepatic insufficiency, hyperuricaemia with gout, serum potassium level less than 3.5mm. 01/l, plasma

creatinine more than 100 mm 01/l, pregnancy or past history of allergy to sulfonamides and related derivatives. Other motives for withdrawal were certain motivated afflictions such as second or third degree auriculoventricular block, frequent extra systole and hepatic failure. Constant elevation of B.P. with diastolic B.P. more than 96 mm of Hg. noted by repeated estimation was the foremost criterion of diagnosis. B.P. of each patient was measured in decubitus after ten minutes rest. Heart rate was noted at rest and a 3rd measurement made after 1 minute of orthostatism. After general physical examination cardiovascular signs specific to essential hypertension such as ringing A₂, left ventricular hypertrophy, systolic murmur, S₃, S₄ gallop and diastolic murmur were thoroughly searched by systemic examination.

In each case the following laboratory investigations were carried out 1) urine examination, 2) stool examination, 3) blood examination (T.L.C., D.L.C., T.R.B.C., E.S.R., Hb% and P.C.V.), 4) X-ray of chest PA view, 5) E.C.G., 6) fasting blood sugar, 7) total blood cholesterol, 8) serum urea, 9) serum creatinine, 10) serum potassium.

Criteria for assessment : In order to assess the severity of illness and the effect of treatment each case was evaluated prior to commencement of treatment periodically during the course of treatment at the end of 10, 20 and 30 days. The disease primarily being an asymptotic condition B.P. value was considered the cardinal feature for assessment. The condition was further

analysed on the mode of onset and duration of both labile and constant elevation of B.P. The sign & symptom were classified as features related to vitiated *Dosha Dhatu Mala* and features relevant to elevation of B.P. Each feature was graded as mild, moderate and severe.

Interpretation of result : Assessment of the overall effect of treatment was interpreted in the following categories :

1. **Marked improvement:** 75% or more reduction of B.P. to normal limit and same percentage of relief and improvement in sign, symptom and laboratory investigation values.
2. **Moderate improvement:** 50% to 74% reduction of B.P. to normal limit and same percentage of relief and improvement in sign, symptom and laboratory investigation values.
3. **Slight improvement:** 25% to 49% reduction of B.P. to normal limit and same percentage of relief and improvement in sign, symptom and laboratory investigation values.
4. **No improvement:** Less than 25% reduction in B.P. less than 25% relief in sign, symptom and no or negligible change in laboratory investigation values.

Observations

The observations of clinical findings are given in following tables which are self explanatory.

Table 1
Rakta Vata duration of illness in the cases

Duration of illness (in month)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Number of cases	12	6	1	2	1	—	5	1	—	2	—	2	3	2	—	2	—	1

Table 2
Pulse rate of the patients

Pulse rate	75-80	81-85	86-90	91-95	96-100
Number of cases	18	10	6	4	2

Table 3
Systemic signs in the patients

Cardiovascular Sign	Ringing A ₂	L.V.H.	S ₃ gallop	S ₄ gallop	Systolic murmur
Number of cases	8	12	10	1	6

Table 4
Keith-Wagenar-Barker classification of fundus*

Optic fundus	Normal fundus	Change			
		Grade-I	Grade-II	Grade-III	Grade-IV
Number of cases	24	10	4	2	-

* Fundus gives 4 types of grading of hypertension and roughly indicates its duration and etiology.

Table 5
Blood cholesterol in the patients

Blood cholesterol (in mg.)	110-140	141-170	171-200	201-230	231-260
Number of cases	12	10	2	-	16

Table 6
Blood urea of the cases

Blood urea (in mg. percentage)	20-25	26-30	31-35	36-40	41-45
Number of cases	12	18	2	6	2

Table 7
Fasting blood sugar (glucose oxidase) method

Fasting blood-sugar (in mg. percentage)	70-80	81-90	91-100	101-110
Number of cases	12	14	10	4

Table 8
Serum creatinine in patients

Serum creatinine (in mg. %)	0.5-1.00	1.0-1.5	1.6-2.00
Number of cases	20	16	4

Table 9
Serum potassium in patients

Serum potassium (in mg.)	3.09-3.99	4.00-4.09	4.10-4.19	4.20-4.29	4.30-4.39
Number of cases	2	20	-	10	8

Table 10
Electro-cardiogram of the *Raktavata* patients

Electro-cardiogram	Normal E.C.G.	L.V.H.	L.V.H with strain	Extra systol
Number of cases	26	14	2	1

Table 11
X-ray chest of the *Raktavata* patients

X-ray chest	Normal Skiagram	L.V.H.	Aoticknob prominance	Basal congestion
Number of cases	28	12	2	1

Discussion & Results

As the sample size in this study is very small i.e., 40, divided into two groups viz., trial group consisting of 20 patients and control group consisting of 20 patients, we do not comment regarding the prevalence, age, sex, non-compliance smoking habit, family history, inhabitation, occupation and socio-economic status, diet, salt intake, *Sara, Samhanana, Satwa & Prakriti*.

However the clinical findings design was that of an open study for one month active treatment in both trial and control groups and at the end of the course the results of both groups were compared in order to assess the efficacy of indigenous trial compound on essential hypertension.

In tune with a symptomatic nature of early hypertension 30% patients did not present for any symptom concerning to their raised pressure. Rather they complained some other illness but on routine physical examination their high

blood pressure could be diagnosed. Known cases complained some symptoms of which common occurrences were giddiness, insomnia and dyspnoea. Detailed methodical evaluation demonstrated mean systolic and diastolic blood pressure values respectively as 172.4 ± 23.31 mm. of Hg. and 133.8 ± 16.72 mm. of Hg., and mean pulse rate 82.6 ± 6.24 beats/min. Obesity was recorded in 20% of cases (Table 13).

Ringing A₂, and having apical impulse with systolic murmur were common cardiovascular findings. Careful auscultation in few cases revealed S₃ and S₄ gallop. Left ventricular hypertrophy was clinically elicited in 14 number of cases which afterwards was confirmed by E.C.G. and X-ray.

Recently increasing attention has been paid to the effects of anti-hypertensive drug therapy on plasma lipid profile indicated by numerous review articles (Ames, 1968). The most talked about coronary risk factor i.e.,

Table 12
Statistical analysis showing the effectiveness of T.D.¹ & C.D.².

Symptoms & signs	Giddiness	Insomnia	Dyspnoea	Palpitation	Chest-pain	Headache	Diffractive vision	Hemiplegia	Ringing A ₂	L . V . H .
Trial drug group										
Mean± S.D.	1.33±	1.88±	1.11±	1.0±	1.16±	2.0±	1.0±	3.0±	1.5±	1.67±
initial	0.47	0.31	0.31	0	0.37	0	0	0	0.5	0.75
Mean± S.D.	0.33±	0.44±	0.33±	0.14±	0.0±	0.75±	1.0±	2.0±	0.5±	1.5±
after treatment	0.47	0.5	0.47	0.35	0	0.43	0	0	0.5	0.5
't' value	>5.04	>5.04	>5.04	>4.32	>4.77	>3.18	-	-	>3.18	<2.57
'P' value	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	-	-	<0.005	>0.05
Remark	Significant	Significant	Significant	Significant	Significant	Significant	Not effective	Partial effective	Significant	Not effective
Control drug group										
Mean± S.D.	1.33±	1.89±	1.11±	1±	1.17±	2.0±	1±	3±	1.5±	1.67±
initial	0.47	0.31	0.30	0	0.37	0	0	0	0.5	0.75
Mean± S.D.	0.00±	0.11±	0±	0±	0±	0.5±	1±0	1±	0±0	0.33±
after treatment	0.00	0.31	0	0	0	0	0	0	0	0.75
't' value	>5.04	<5.04	<5.04	>5.4	<6.86	<4.18	-	-	>4.18	>4.77
'P' value	<0.001	<0.001	<0.001	<0.001	<0.01	<0.025	-	-	<0.025	<0.05
Remark	Highly significant	Significant	Not effective	Partial effective	Significant	Highly significant				

>= greater than, <=Less than, the above t-values are examined, 't'= test of significance, 'P'=Probability, Tabulated t-values are as follows: $t_{\alpha/2}, 0.1\% = 5.04$, $t_{\alpha/2}, 0.5\% = 4.32$, $t_{\alpha/2}, 0.5\% = 4.77$, $t_{\alpha/2}, 0.5\% = 3.18$, $t_{\alpha/2}, 5\% = 2.57$, $t_{\alpha/2}, 0.1\% = 6.86$, in the above table the calculated 't'-values are compared with the tabulated t-value.

Table 13
Effectiveness of the sign/symptom

Sign & symptom Measures	Control group			Trial group		
	Systolic pressure	Diastolic pressure	Pulse rate	Systolic pressure	Diastolic pressure	Pulse rate
Mean±S.D.	166.8±	105.9±	80.4±	172.4±	133.8±	82.6±
initial	20.03	6.24	4.36	23.31	16.72	6.24
Mean±S.D.	138.4±	91±	73.7±	151.8±	102.7±	76.4±
after treatment	11.88	5.2	2.47	20.39	12.96	4.92
't' value	>3.88	>3.88	>3.88	>3.88	>3.88	>3.88
'p' value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Remarks	Highly significant					

Tabulated value $t_{19}, 0.1\% = 3.88$, in the above table the calculated values are compared with the tabulated value.

Table 14
Effectiveness of the lab-findings.

Sign & symptom Laboratory findings measures	Control group				Trial group			
	Blood cholesterol	Blood urea	Serum creatinine	Serum potassium	Blood cholesterol	Blood urea	Serum creatinine	Serum potassium
Mean±S.D.	202.7 ±	34.15±	0.97±	4.03	184.8±	29.45±	1.00±	4.10±
initial	26.90	6.33	0.05	0.24	54.69	6.07	0.03	0.26
Mean±S.D.	180.85±	31.5±	-	4.1±	166.8±	26.45±	1.01±	3.93±
after treatment	19.52	6.56	-	0.18	43.16	4.97	0.21	0.25
't' value	>3.88	>3.88	-	<2.09	>3.38	>3.88	>2.09	>3.88
'P' value	<0.001	<0.001	-	>0.05	<0.001	<0.001	<0.05	<0.001
Remark	Highly significant	Highly significant	Not effective	Not significant	Highly significant	Highly significant	Highly significant	Highly significant

Tabulated value $t_{19}, 0.1\% = 3.88, t_{19}, 5\% = 2.09$

Table 15**Clinical assessment of result (T.D. & C.D.)**

Result	Marked improvement	Moderate improvement	Slight improvement	No improvement
T.D.	6	6	5	3
C.D.	16	4	-	-

T.D. = Trial drug, C.D. = Control drug

hypercholesterolaemia was searched for. It was detected in 40% cases of which 6 patients were males and 10 females. The low prevalence of cholesterolaemia in females as reported in text book goes in contrast to their findings, perhaps because of small number of random samples. The effect of hypertension on individual was also investigated. Common target organs likely to be involved in hypertension are heart, kidney and brain. Left ventricular hypertrophy found in 35% of cases implies that the disease was present with them for a considerable period of time.

From recent studies it seems that the cardiovascular risk of hypertension depends not only on B.P. on resting conditions but more particularly on increase of B.P. induced by daily physical activity and emotional response.

Effect of treatment on B.P. : *Brahmyadi Ghana Vati* provoked a significant reduction in systolic blood pressure observed after 5 minutes, of decubitus, the systolic pressure decreasing from

172.4 ± 23.31 to 151.8 ± 20.39 after 20 days treatment. Analysis of variance showed the fall in systolic B.P. induced by *Brahmyadi Ghana Vati* during 1 month treatment was highly significant ($P < 0.001$). Also the trial drug provoked a fall in diastolic blood pressure from 133.8 ± 16.72 to 102.7 ± 12.96 mm. of Hg. after 30 days course. The analysis of variance showed the fall of diastolic B.P. by *Brahmyadi Ghana Vati* for one month treatment was highly significant ($P < 0.001$).

The maximal reduction in systolic and diastolic B.P. was induced by atenolol in comparison to *Brahmyadi Ghana Vati* while control drug invoked 77.77% of reduction in systolic and 90.90% reduction in diastolic pressure, trial drug produced 47.6% and 45.83% respectively. Another noticeable difference was that the trial drug stabilises the B.P. at its maximal effective level, more or less after 20 days of treatment. But with atenolol systolic and diastolic pressures start to exhibit a downward trend from the very date of the beginning of treatment.

Table 16**Percentage of improvement obtained against each individual case**

Case No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Trial drug (percentage)																				
Group	58.1	61.1	69.66	78.33	43.50	87.3	7.00	16.66	43.26	40.00	27.5	51.66	75.53	22.33	23.6	44.03	80.33	57.5	70.00	97.00
Control drug (percentage)																				
Group	99.46	97.05	11.00	181.24	84.96	10.00	112.5	54.29	85.00	57.37	125.00	66.02	95.39	51.84	86.97	82.61	80.35	81.66	90.76	122.00

Table 17**Blood pressure of the patients**

B.P. Range	95-100	101-110	111-120	121-130	131-140	141-150	151-160	161-170	171-180	181-190	191-200	201-210	211-220	221-230
Number of cases	6(D)	24(D)	4(D)	-	-	2(D) 4(D)	6(S)	14(S)	6(S)	4(S)	2(S)	-	6(S)	2(S)

D = Diastolic, S = Systolic

Effect on heart rate : The initial heart rate in the trial group was 82.6 ± 6.24 beats/min. but after 30 days of treatment with the T.D. it reduced to 76.4 ± 4.92 beats/min. Comparision shows trial and control drugs respectively invoke 60% and 87.5% reduction of pulse rate towards the normal value after one month treatment.

Effect on body weight : No significant changes in body weight were noted with trial & control drugs.

Effect on biological values : After one month treatment with T.D. blood cholesterol, urea and potassium were significantly reduced with 'P' value less than 0.001, but serum creatinine was marginally raised. Similar result was also observed with control drug.

Effects on symptom and cardiovascular sign : Comparision shows a significant difference between two groups calculated on the basis of scoring. The initial score of 102 in trial group reduced to 38 invoking 62.6% relief. In control group initial score 102 decreased to 8 showing a highly significant reduction of 92.1%.

Side effects : In *Brahmyadi Ghana Vati* group no side effect was noticed.

Conclusion

In this study the treatment of essential hypertension by *Brahmyadi Ghana Vati*

led to lowering of B.P. in all and normalisation in 15% of mild to moderate hypertension. A significant reduction in both systolic and diastolic pressure was observed by 20 days of treatment and increased during the course of one month period. Heart rate was also modified significantly during this short term study. It was of interest to note that the drug provoked slight body weight loss during the one month treatment suggesting that this compound causes water and sodium elimintion and therefore differs from vasodilator compounds. It is of interest to note that patients aged over 60 years responded in the same way as the others, without there being any instances of orthostatic hypotension or any particular bio-chemical abnormality. Bio-chemical acceptability was very good with slight degree reduction in blood cholesterol, urea and potassium and the later on test confirmed a very mild kaliuretic effect. The clinical tolerance was excellent, assessed by both patients and investigators as the drug confirmed 62% reduction of symptoms and signs in respect to raised pressures. Analysis of electrocardiograms failed to show any significant change with the exception of heart rate which decreased moderately.

Therefore, on point of view of Ayurvedic treatment- *Brahmyadi Ghana Vati* may be accepted as the drug of choic

in the primary treatment of mild or moderate hypertension. It offers the possibility of effectiveness and very well tolerated therapy ensuring reliability and good acceptance in use.

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सारांश

ब्राह्म्यादि घन वटी का रक्तचाप वात पर अध्ययन

सुरा तरंगिणी रथ, राधाकान्त मिश्र एवं ब्रज किशोरदास

इस अध्ययन के अंतर्गत ४० रोगियों पर इस औषधि का प्रभाव अध्ययन किया गया। ये सभी रोगी रक्तवात से पीड़ित थे। जिनका निम्न रक्तचाप ६६ से १५५ एम.एम. पाया गया। सम्पूर्ण रोगियों को २ वर्ग में विभाजित किया गया। २० रोगियों में ब्राह्म्यादि घन वटी तथा द्वितीय वर्ग के ५०० मिलीग्राम मात्रा में दिन में २ बार, शेष २० रोगियों में एटिनोलोल ५० मिलीग्राम दिन में दो बार प्रयोग किया गया। रोगियों को वसा एवं लवण न लेने का निर्देश दिया गया। ३० दिन के अध्ययन के बाद पाया गया कि ब्राह्म्यादि घन वटी से रक्तचाप के ३० प्रतिशत रोगियों में अधिक लाभ, ३० प्रतिशत रोगियों में सामान्य लाभ तथा २५ प्रतिशत रोगियों में अल्पलाभ एवं १५ प्रतिशत रोगियों में कोई लाभ नहीं देखा गया।

विश्लेषण से ज्ञात हुआ है कि रक्तचाप कम करने में ब्राह्म्यादि घन वटी एक प्रभावकारी औषधि है। ज्ञात औषधि एटिनोलोल से ८० प्रतिशत रोगियों में अच्छा लाभ और २० प्रतिशत रोगियों में सामान्य लाभ देखा गया।