

EVALUATORY STUDY OF ESSENTIAL HYPERTENSION WITH SPECIAL REFERENCE TO *SANTARPAN AND APATARPAN HETU*

Swati P. Sarnaik¹, Ranjit A. Deshmukh²

¹ Assitant. Professor, Dept. of Rognidan & Vikritivigyan, MUP'S Ayurved college, Hospital & Research Centre Degaon, Risod, Washim. 7028020647

² Associate Professor & HOD, Dept. of Rachana Sharir, Dr. Rajendra Gode Ayurved College, Hospital and Research Centre, Amravati. 7028020648

Email: drswaranjitd@gmail.com

ABSTRACT

Ayurveda symbolizes holistic approach towards treating disease and better prevention than cure as its one of the main motto. Hypertension is silent or hidden killer of mankind. An elevated arterial pressure is probably most important public health problem in developed countries. Hypertension is major risk factor for cardiovascular disease, stroke and kidney disease leading to high mortality. It is one among the various life style disorder, this result is form a no. of reason like stress, obesity, genetic disorder, excessive alcohol, salt intake, smoking, sedentary life style, so Classification of *hetu* in the category of *santarpan & apatarpan* can help to diagnose the cause of essential hypertension in *ayurvedic* perspective & thus can help to treat the condition also. This study also reflects that *nidanpariwarjan* is the best remedy for the hypertension. The present study reveals the causes of hypertension in *Ayurvedic* aspect. Hypertension is primarily diagnosed on basis of systolic and diastolic blood pressure while lipid profile is advocated to study the risk level. The effect of *santarpan* and *apatarpan hetu* was observed on systolic and diastolic blood pressure and lipid level to execute severity among them, so outcome of the study is to know the exact cause of hypertension.

Keywords: Hypertension, *Ayurvedic* pathogenesis, *Santarpan- Apatarpan hetu*, Blood pressure, Lipid profile.

INTRODUCTION

Human life has been considered as a valuable opportunity to achieve the prime goal of life viz. *dharma, artha, kama, moksha*. To achieve this, one needs a healthy & calm life. Whole ancient culture tried to achieve all four prime goals of life, so that they had a smooth, sound, safe, steady & healthy life style. On other hand, today mankind is trying to gain good financial status to fulfill all physical desire. Howev-

er, during ensuing century, there have been tremendous changes in lifestyle. Therefore today's metaphysical society is facing unsteady, weaken, hard & everyday changing lifestyle. The miserable gift of stressful, hectic lifestyle, diet habit, an environmental changes that man has become victim of many disease like obesity, hypertension, diabetes, AIDS etc. Among which most potent gift is hypertension.

Hypertension is silent or hidden killer of mankind. An elevated arterial pressure is probably the most important public health problem in developed countries. Most sufferers are asymptomatic & as per available report, in more than 95% cases of hypertension underlying cause is not found, such patients are said to have essential hypertension. Essential hypertension is common asymptomatic, readily detectable, usually easily treatable & of uncured them often leads to lethal complications. If it is untreated in the long run, it chiefly affects heart, brain & retina. Thus now days it has become a life threatening disease.

Though, *Ayurvedic* texts provides no straight reference to essential hypertension, here is an effort made to understand the possible pathogenesis in terms of involved factors like *dosha*, *dushya* etc. According to *Aacharya Agnivesh* naming of a disease is not essential, removal of disease is more important. *Aacharya charaka* recommended that if a physician is unable to diagnose the disease, he should treat the disease considering *rog prakriti*, *rog adhishtan*, *rog samutthan*. *Chakrapanidatta* in his commentary includes *vyadhi hetu*, vitiation of *dosha* due to these *hetu*, *vyadhi udbhavsthana* *vyadhi adhishtana* & *vyadhi vyaktisthana* to diagnose & treat the disease.

Understanding Essential Hypertension in the light of *Tridoshas* principle of *ayurveda* it is found that it is “*vata pitta pradhan tridoshas & raktashrit vyadhi*”. In *vata prakopak samprapti*, *Vata* being *ruksha* (dry) & *sheeta* (cold) in nature may cause stiffness of vessels which increases peripheral vascular resistance & leads to hypertension, due to *pitta prakopit hetu*, *ushna tikshna* & *drava guna* of *rakta* increases which results in increased blood volume & which exert the pressure on the wall of blood vessel & leads to hypertension, Third mechanism due to *kapha prakopit hetu*, which cause defect in the vascular smooth muscle (atherosclerotic changes caused by factors like hyperlipidemia) where the blood vessel lose their normal tone & thus increase peripheral resistance causing hypertension. Based on these points it can be deduced that in the patholo-

gy of hypertension all 3 *doshas* are involved & which turns affect the *rasa & rakta dhatu* to cause this condition. Due to these *samprapti*, vitiation of psychological factor viz. *raja & tama* is also present. This vitiated *doshas* leads to vitiation of *rasavaha*, *raktavaha* & *manovaha srotas*.

In the context of “*vyadhi hetu*”, *Aacharya charaka* explained *santarpaniyam adhyaya* which focus the cause of different disease in context of *santarpan* & *apatarpan*. Therefore detail literary review can be observed that *vata*, *pitta*, *kapha*, *rasa*, *rakta dushtihetu* can be classified in two categories i.e.

- 1) *Santarpan aahar vihar janya hetu*
- 2) *Apatarpan aahar vihar janya hetu*

ETIOLOGY OF HYPERTENSION-

- *Santarpan hetu* responsible for Hypertension-
- 1) *Ati madhur bhojan-Madhur rasa* is constituted with *prithvi & jala mahabhuta*, therefore it has *guru manda shita*, *mrudu* property. It produce *ama* & *apakva meda* & ultimately causes *medovridhi*. these property lead to produce obstruction in *rasavaha srotas*.
 - 2) *Ati amla bhojan-Amla rasa* is *prithvi & agni mahabhuta pradhana*, it can cause the *pitta & rakta dushti*.
 - 3) *Ati lavan bhojan-Lavan rasa* is *jala & agni mahabhuta pradhan*, it can cause *pitta, rakta dushti*. *Visyandan* property of *lavan rasa* may be pointing toward change in osmolarity, which could be factor in pathogenesis of essential hypertension.
 - 4) *Ati guru bhojan-Overconsumption of guru aahara* causes *strotouplepa*, it results in narrowing of lumen of artery.
 - 5) *Ati snigdha bhojan-Overconsumption of ati snigdha aahara* causes, *rasavaha & medovaha srotas dushti*. *Snigdha guna* has *kledan property* which causes retention of *jala* & other constituents which leads to increase Hypertension.
 - 6) *Ati vidahi bhojan-It can cause rakta dushti*, vitiated *raktavaha srotas* causes *shonitaj roga*.

- 7) *Samashana* –*Samashana* means taking *pathyakara* & *apathyakara aahara* at a time, due to this *agnimandya* occur and *ama* is formed which produce obstruction in *rasavaha srotas* & *dhamni pratichaya* formed.
- 8) *Adhyashana*-*Adhyashana* means taking food before the previously taken meal is digested, it is also one of the causes of *shonitaj roga*, and due to obstruction of *vyan vatagets* vitiated which leads to forceful *viksepna karma* which exerts excessive pressure on *rasa-raktavahini*.
- 9) *Ati abhishyandi bhojan*-It can cause *kaphaprapkop* which leads to *uplep* in *sira*, *dhamani*, *srotas*.
- 10) *Ati mansa sevan*- It can cause *mansa*, *meda vriddhi* & *rakta dushti*.
- 11) *Madyapana*-*Madya* has *tikta*, *kashay rasa*, *ushna*, *tikshna*, *sukshama*, *vishada*, *ruksha*, *ashukari*, *vyavayi* properties. It can cause *rakta dushti* along with *vata pitta dushti*, *kashay rasa* constricts vessels.
- 12) *Ati nidra*-Due to *ati nidra kapha* & *pitta* get vitiated & elevation of *tamoguna* causes *manodushti*.
- 13) *Divaswapa*-It can cause *jathragnimandya*, *medodhatvagni mandya*, due to this *ama* & *apakva meda* produced causes *medovridhhi*. *Hridpradeshi pralepvat bhavana in divaswapa* .
- 14) *Avyayama*-It can cause *kaphaprapkopa* & *medovridhhi* leading to obstruction in *rasavaha srotas*.
- 15) *Acheshta*- It can cause *kaphaprapkopa* & *medovridhhi*.
- 16) *Achinta*- It is important cause of *medoroga*, excess *apakva meda* leads to accumulation of *dhamni pratichaya*.
- 17) *Atiharsha*-It can causes *kaphaprapkopa* & *medovridhhi*.
- 18) *Vishaditva*-*Vishaditva* is a *tamas manoguna*, it affects *mana* & *hridaya kriya*.
- *Apararpan hetu* responsible for Hypertension-
- 1) *Ati katu rasa sevan*-*Vagbhata* explained that *katu rasa* causes *sira sankoch*.
- 2) *Ati tikta rasa sevan*-According to *vagbhata* it can causes *dhatukshaya* & *vatavyadhi*.
- 3) *Ati kashay rasa sevan*-*Charaka* explained that it can cause *strotorodha* & *sushruta* mention that it can cause *hrudayapida*.
- 4) *Alpabhojan*-Due to this diminution of *bala*, *pushti* & *oja* cause *vataprapkopa* & *sankoch* of *sira* occur.
- 5) *Shushka bhojan*-It can cause *vataprapkop*, loses its *snigdhatva* resulting in *sira*, *dhamani sankocha* & *kathinya*.
- 6) *Ruksha bhojan*-*Vata prakopa* occurred.
- 7) *Ati kshar sevan*- It exerts pressure over *sira* & *dhamni* raising BP.
- 8) *Ati langhan*- *Vagbhata* explains that *atilanghana* causes *hrudshula*.
- 9) *Ati vyayam*- Due to this *vata pitta prakopa* & *raktadushti* occur.
- 10) *Ati jagaran*- According to *sushruta*, ignoring normal sleep at night aggravates *vata-pitta dosha* & affects physical, psychological health.
- 11) *Visham upchara*- Due to this damage of vital organ occur & contributes in production of toxins, causes *vata prakopa* .
- 12) *Vegvidharana*- *Vata prakopa* occur which cause of *sira sankocha*.
- 13) *Plavana*- Due to this *vata prakopa* occur.
- 14) *Ati atap sevan*- It can cause *pitta prakop* & *rakta dushti* .
- 15) *Shramadhikya*- *Rakta* & *mansa kshaya* occur, due to which *vata*, *pitta* get vitiated.
- 16) *Abhighat*- In *Abhighat* vitiated *vata* mixed with *rakta*.
- 17) *Chinta*- *Chinta* causes *ojakshay* & *rasavaha srotas dushti* which affect the *rasa rakta samvahan*.
- 18) *Bhaya*- It can cause *vataprapkopa* & *sirasankocha*.
- 19) *Shoka*- It is *manas vikara* affect *hridaya* by increasing cardiac output resulting in Hypertension & *vataprapkopa*, *sirasankoch* occurred.
- 20) *Krodha*- It can cause *vata* & *pitta prakopa* which leads to vitiation of *rakta dhatu*.

SAMPRAPTI GHATAK OF HYPERTENSION-

- 1) **Nidana-** *Vataprakopak, pittaprakopak, kaphaprakopak, rasa dushti, rakta dushti, vataraktadushti, manas dosha dushti nidana* are involved.
- 2) **Dosha-**
Vata- vyan, prana, apana, samana
Pitta- pachaka, sadhaka
Kapha- avalambaka
Manasa- raja, tama
- 3) **Srotas-** *Rasavaha, raktavaha, manovaha*
- 4) **Srotodushhti prakara-** *Atipravrutti, sanga*
- 5) **Agni-** *Jatharagnimandya, dhatvagnimandya*
- 6) **Ama-** *rasagata*
- 7) **Udhabhava sthana-** *Pakvashaya- amashaya*
- 8) **Avayava-** *Hrudaya, dhamani, sira*
- 9) **Adhishtana-** *Sharir & manasa*
- 10) **Sancharasthana-** *Sarva sharira*
- 11) **Rogamarga-** *madhyama*
- 12) **Svabhava-** *chirkalina*

Aim & Objectives:

Aim-

To evaluate essential hypertension in terms of *santarpan & apatarpan hetu* observing its effect on systolic & diastolic blood pressure & lipid profile to execute severity among them.

Objectives-

1. To study *santarpan & apatarpan hetu* of essential hypertension & to execute severity among them.
2. To compare the level of systolic & diastolic BP & lipid level in the patient of essential hypertension due to *santarpan & apatarpan hetu*.

1. Santarpan hetu-

S.N	HETU
1	<i>Ati madhur bhojan</i>
2	<i>Ati amla bhojan</i>
3	<i>Ati lavan bhojan</i>
4	<i>Ati guru bhojan</i>
5	<i>Ati snigdha bhojan</i>
6	<i>Ati vidahi bhojan</i>
7	<i>Samashan (Combine intake of hit, ahit bhojan)</i>
8	<i>Adhyashana (excessive consumption of food)</i>

Material & Method:-

1] Material-

100 patients attending OPD/IPD of *kayachikitsa* department of SAM, SANGAMNER are selected randomly according to inclusion & exclusion criteria for the study irrespective of sex, religion.

1. Inclusion criteria-

- a) Patient between age 30 to 50 yrs irrespective of gender & occupation.
- b) Diagnosed patient hypertension (having hypertension more than 1 year)

2. Exclusion criteria-

- a) Patients below age 30 & above 50 yrs.
- b) ANC women & lactating mother.
- c) Patient suffering from- malignancy, TB, renal failure, hepatitis, D.M.

2] Methodology

- a. Screening of the patients was done.
- b. **GROUP A-** 50 patients having hypertension due to *santarpan hetu* were screened & selected.
- c. **GROUP B-** 50 patients having hypertension due to *apatarpan hetu* were screened & selected.
- d. Systolic & diastolic blood pressure level in both groups was recorded.
- e. Serum triglyceride & serum cholesterol level in both groups was recorded.
- f. Average values of blood pressure level & lipid levels in both groups were compared.
- g. Assessment of all the selected cases was done according to the following assessment criteria.

A. Assessment of patients according to hetu

9	<i>Ati abhishyandi bhojan</i>
10	<i>Ati mansa sevan</i>
11	<i>Madyapan</i>
12	<i>Ati nidra</i>
13	<i>Diwaswap</i>
14	<i>Avyayam</i>
15	<i>Acheshta</i>
16	<i>Achinta</i>
17	<i>Atiharsha</i>
18	<i>Vishaditwa (mudhata)</i>

2. Apatarpan hetu-

SN	HETU
1	<i>Ati katu rasa sevan</i>
2	<i>Ati tikta rasa sevan</i>
3	<i>Ati kashay rasa sevan</i>
4	<i>Alpa bhojan</i>
5	<i>Ruksha bhojan</i>
6	<i>Shushka bhojan</i>
7	<i>Ati kshar sevan</i>
8	<i>Ativyayama</i>
9	<i>Atijagran</i>
10	<i>Visham upachar (wrong treatment)</i>
11	<i>Vegvidharan</i>
12	<i>Plavana (swimming)</i>
13	<i>Aatap sevan</i>
14	<i>Langhan</i>
15	<i>Shramadhikya</i>
16	<i>Abhighata</i>
17	<i>Chinta</i>
18	<i>Bhaya</i>
19	<i>Shoka (dukhabhahulya)</i>
20	<i>Krodha</i>

B. Assessment of blood pressure levels

1. Systolic blood pressure
2. Diastolic blood pressure

C. Assessment of lipid profile levels

1. Serum Triglyceride
2. Serum Cholesterol
3. HDL Cholesterol
4. LDL Cholesterol
5. VLDL cholesterol

OBSERVATION & DISCUSSION

As such the direct description of hypertension is not available in *ayurvedic* classical text but there is a

trend to describe this disorder by literally translating the term by making some prefix to the term *rakta*. In literal translation of hypertension, *rakta* is used as common prefix & different suffix as to denote the pressure like '*bhara, daba, chapa, sampida*' etc. The process of nourishment of various *dhatu* (body tissue) & excretion of metabolic waste product of *dhatu* are going on continuously within human body. The mechanism is carried out by the *rasaraktasamvahana*[13]. The main organ of this system is *hrudaya*. The circulation of *rasa rakta* is achieved & regulated by various mechanisms. The *rasa rakta* is circulated through the *sira, dhamani*.

For proper circulation certain amount of pressure is needed. This pressure is generated by pumping action of *hrudaya*, the state of wall of *sira*, size of lumen & volume of blood[3]. For proper supply of nutrients & excretion of waste as per requirements during variations in external & internal environments, the pressure within the *sira* & *dhamani* needs to be change accordingly. This changes of pressure is regulated by the complex interaction of *tridosha* as all the functions of the body are regulated by *tridosha*[2]. The various *dosha* involved in this regulation process are *pran*, *saman*, *vyan*, *apan vata*, *pachaka* & *sadhaka pitta*, *avalambak kapha* [4][5]. *Medovaha srotas*[6] is closely related to the lipid metabolism & *manovaha srotas* [7] is also involved in manifestation of Hypertension by psychogenic stress.

The present study is mainly related to the essential hypertension & its etiological factors (*hetu*) in *ayurved* perspectives. It is related to the elaboration of possible causes of essential hypertension available in *ayurved* literature and correlates their cause & effect relationship. *Ayurved* literature does not provide straight reference of essential hypertension. It is in scattered & clue form.

As literary review concludes that essential hypertension is a disease condition mainly related to *hridaya* & its components that is *vata dosha*, *pitta dosha*, *kapha dosha*, *rasa-rakta dhatu* & its *srotas*. Considering above factors it can be concluded that essential hypertension is *vata pitta pradhan tridoshaj* & *raktashrit vyadhi*. Vitiating of these components result into raised blood pressure which is the cardinal sign of hypertension. Therefore the cause (*hetu*) of vitiating of these components are ultimate causes of hypertension but these cause are not listed categorically in *ayurveda* text, so it is very essential to categorise these causes to provide scientific basis & easy access of the listed *hetu*, so after detail review

& study of all these *hetu* it is observed that these cause either create *vridddhi* or *kshaya* & then leads to *etiopathogenesis* in two way. *Vridddhikar hetu* leads to *santarpan* of *dosha dushya*, *jatharagnimandya*, *srotouplep*, *avarodhajanya samprapti* and *kshayakar hetu* leads to *apatarpan* of *dosha dushya*, *agnidushti*, *strotovaigunya*, *shaithilya of dhamni & sira*. Therefore these *dosha*, *dushya*, *srotas*, *agni* vitiating *hetu* can be classified into 2 main categories that is *santarpan aahar vihar janya hetu* & *apatarpan aahar vihar janya hetu* considering pathogenesis of hypertension. *Santarpan hetu* nourishes the *rasadi dhatu* in excessive quantity due to which *rasa*, *rakta*, *mansa*, *meda dhatu* increases in abnormal quantity. Lipids are group of naturally occurring molecules that include fats, waxes, sterol. These lipids resemble to excessive & vitiating *meda dhatu*. In this way maximum consumption of *santarpan hetu* & less metabolism of lipids increases its level in blood. Therefore lipid level are higher in *santarpanoth* patients, continuous sevan of *santarpan dhatu* also causes *kaphaprakopa* & *jatharagnimandya* which result in formation of *aama* & causes obstruction in *srotas*, thus excessively produced *rasadi dhatu*, *aama* & *vikrut medodhatu* obstruct *sira*, *dhamni* & *srotas* producing atherosclerosis which result in hypertension. In *apatarpan hetu vataprakopa* associated with *pittadushti* is the most important factors for higher blood pressure levels. It can causes *dhatukshay* & vitiating *rakta*, *mansa* & *meda dhatu* & vitiating *pitta* increases volume of vitiating blood. *Rakta*, *mansa*, *meda dhatu* is related with *sira*, *dhamni* & *rasaraktasamvahan kriya*, vitiating of *rakta dhatu* due to *vataprakop* causes *kharatva*, *shaithilya*, *sankoch* of *sira* & *dhamni*. *Sankoch* of *sira* causes narrowing of lumen, *shaithilya* of *sira* causes loosening in texture. Thus increases volume of vitiating blood when passes through *sankuchit*, *shital*, thickened, narrow *sira* & *dhamni*, it get obstructed producing arteriosclerosis which result in hypertension.

Statistical Analysis-

The present study is observational in between two groups with independent variables, so unpaired t- test applied to test significance of observation.

S N		Systolic BP		Diastolic BP		Sr. triglyceride		Sr.cholesterol		HDL		LDL		VLDL	
		A	B	A	B	A	B	A	B	A	B	A	B	A	B
1	Average	152.64	157.52	94.44	95.64	179.26	158.48	215.96	197.76	41.96	43.54	105.92	97.40	29.43	27.61
2	Mean	76.32	78.76	47.22	47.82	89.63	79.24	108.0	98.88	20.98	21.77	52.96	48.70	14.72	13.81
3	Median	76.32	78.76	47.22	47.82	89.63	79.24	108.0	98.88	20.98	21.77	52.96	48.70	14.72	13.81
4	SD	107.9	111.4	66.78	67.63	126.8	112.1	152.7	139.8	29.67	30.79	74.90	68.87	20.81	19.52
5	P-value	0.9843		0.9937		0.9387		0.9561		0.9815		0.9582		0.9681	

CONCLUSION

Classification of *hetu* in the category of *santarpan* & *apatarpan* can help to diagnose the cause of essential hypertension in *ayurvedic* perspective & thus can help to treat the condition also. This study also reflects that *nidanpariwarjan* is the best remedy for the hypertension. In present study it is observed that, average blood pressure of *apatarpan hetu* is more common than *santarpan hetu* while lipid level of *santarpan hetu* is on higher side. Thus *santarpan hetu* leads to atherosclerosis while *apatarpan hetu* leads to arteriosclerosis to cause essential Hypertension.

Ati lavan bhojan is the most common *hetu* found in 46 patients while *chinta* recorded in 40 patients it clearly indicates the severity of these *hetu*. *Ati lavan bhojan* is *aahariya santarpan hetu* while *chinta* is *manas apatarpan hetu*. Presence of 40 patient with *chinta* clearly indicate that continuous stressful psychological condition is also equally responsible for hypertension. Highest average value of blood pressure recorded in *madyapana* patients followed by *chinta*. Despite of these *hetu ati mansa seven, ati katu rasa seven, ati kashaya rasa seven, ati lavan bhojan, ati kshar seven, shramadhikya, ati vidahi bhojan, adhyashan* are the *hetu* contributing in high BP.

As far as lipid concern, serum triglyceride levels found maximum in *samashan*, serum cholesterol & LDL level in *madyapana* while VLDL in *ati guru bhojan*. Despite of these *hetu achinta, diwaswap, guru bhojan, lavan bhojan, vidahi bhojan, ati mans seven, atinidra & amla bhojan* contributes in increasing all lipids. It is clear that top 9 *hetu* increasing lipid levels are from *santarpan* group while *ati kashay rasa sevan* is the only *hetu of apatarpan* which increasing lipid level..

REFERENCES

1. Kashinath Shastri & Gorakhnath Chaturvedi, Charaka Samhita Vidhyotini Tika (Sutrasthana), 11th edition, Varanasi, Chaukhamba Bharati Academy, 1983, Sutrasthana 18/45-46- 383.
2. Yadavji Trikamji, Narayan Ram, Sushruta samhita (Nivandha samgraha commentary of Dalhan & the Nyayachandrika panjika of Gayadasa), 1st edition, Varanasi, Chaoukhambha Surabharati Prakashan, 2003 sutrasthana 21/8 - 100.
3. O. Rourke M. Arterial stiffness, systolic Blood Pressure, And Logical Treatment Of Arterial Hypertension. Hypertension. 1990; 15(4):339-34.
4. Dhundi SN, Yadav PR, Prajapati P, Etiology Based Study Of Hypertension In An Ayurvedic Approach. Anc Sci Life. 2010; 30(2):33-41.
5. Sahu D, Indoria AK, Gupta MC, Understanding Hypertension On Ayurvedic Perspective- a critical review. Ayurpharma Int J Ayur Alli Sci- 2015; 4(3): 48-53.
6. Zicha J, kunes J, Devynck MA. Abnormalities Of Membrane Function And Lipid Metabolism In Hypertension: A review. Am J Hypertens.1999;12(3):315-331.
7. Patel Dhananjaya et al, Role Of Manas Bhavas In The Etiopathogenesis Of Uccharaktachap & Its Management With Medhya Rasayana & Shirodhara, MD thesis, GAU, Jamnagar 2003.
8. Shukla Vidyadhar, Charak Samhita (Sutrasthana), 4th edition, Pune, 701, Vaidyamitra prakashan, 2009, Sutrasthana 23/3-5 - 285.
9. Shukla Vidyadhar, Charak Samhita (Sutrasthana), 4th edition, Pune, 701, Vaidyamitra prakashan, 2009, Sutrasthana 23/26-27, p. 287.
10. Sharma Priyavrata, Charak Samhita (Chikitsasthana with chakrapanidatta's Ayurveda Dipika) 5th edition, Varanasi , Chaukhamba Sanskrit Pratishthan, 2003, Chikitsasthana , 28/15-18 p. 690
11. Sharma Priyavrata, Charak Samhita (Nidansthana with chakrapanidatta's Ayurveda Dipika) 5th edition,

- Varanasi , Chaukhamba Sanskrit Pratishthan, 2003, Nidansthana , 1/22 p. 473
12. Sharma Priyavrata, Charak Samhita (Nidansthana with chakrapanidatta's Ayurveda Dipika) 5th edition, Varanasi , Chaukhamba Sanskrit Pratishthan, 2003, Nidansthana , 1/25 p. 474
13. Sharma Priyavrata, Charak Samhita (Chikitsasthana with chakrapanidatta's Ayurveda Dipika) 5th edition, Varanasi , Chaukhamba Sanskrit Pratishthan, 2003, Chikitsasthana , 15/36 p. 366
14. Sharma Priyavrata, Charak Samhita (Vimansthana with chakrapanidatta's Ayurveda Dipika) 5th edition, Varanasi, Chaukhamba Sanskrit Pratishthan, 2003, Vimansthana , 5/13 p. 544
15. Sharma Priyavrata, Charak Samhita (Vimansthana with chakrapanidatta's Ayurveda Dipika) 5th edition, Varanasi, Chaukhamba Sanskrit Pratishthan, 2003, Sutrasthana 24/5-10, p. 289.
-

Source of Support: Nil

Conflict Of Interest: None Declared

How to cite this URL: Swati P. Sarnaik & Ranjit A. Deshmukh: Evaluatory Study Of Essential Hypertension With Special Reference To Santarpan And Apatarpan Hetu. International Ayurvedic Medical Journal {online} 2018 {cited July, 2018} Available from: http://www.iamj.in/posts/images/upload/1409_1416.pdf