

ROLE OF *SHIRODHARA BY BRAHMI TAILA* IN ESSENTIAL HYPERTENSION: A  
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## ABSTRACT

Hypertension is a most common life style disorder and an important public health challenge in both economically developing and developed countries. Also it is one of the psycho-somatic disease and important risk factors for cardiovascular mortality. It has been estimated that hypertension accounts for 6% of deaths all over world. With the increasing age, the burden of hypertension increases and more among the individuals aged  $\geq 60$  years and its prevalence is 65.4%. There is no any direct reference of Hypertension in Ayurveda. So according to its dosha, dusya, lakshana etc. we can correlate with raktagata vata, vata vyadhi or rakta vridhhi etc. In India, Shirodhara is a common and ancient ayurvedic procedure, and its clinical benefits are being observed in thousands of patients. It involves the rhythmic and consistent flow of lukewarm oils or any medicated liquid on the forehead for atleast 30 mintues. Brahmi is a medhya drug along with anti hypertensive effects. Taila itself has vatahara, suksma and sinigdhtva properties. So Shirodhara by medhya drug i.e. Brahmi taila may be probably beneficial and useful for breaking the pathogenesis of Essential Hypertension.

**KEYWORDS:** Hypertension, Essential hypertension, Raktagata vata, Shirodhara, Brahmi taila.

## INTRODUCTION

Hypertension now becomes a cause of global concern and it is truly called a "Silent Killer" because it rarely exhibits symptoms in early stage, until it damages the heart, brain or kidney. In present era, Hypertension is one among the most common public health issue. Now-a-days prevalence rate of hypertension is increasing day-by-day due to rapid modernization, stressful life, improper life style and unhealthy dietary habits.<sup>[1]</sup> Its estimated that approximately 1 billion people worldwide are suffering from hypertension and by the year 2025, its number is expected to increase to 2.5 billion.<sup>[2]</sup> Incidence of Hypertension is also high among the Indian population and 14% of people in India are suffering from hypertension in which majority of them have essential hypertension.<sup>[3]</sup> Essential hypertension is characterized by chronic elevation of blood pressure due to an unknown etiology.<sup>[4]</sup> It affects nearly 95% of hypertensive patients.<sup>[5]</sup> In US, more than 65 million adults have essential hypertension.<sup>[6]</sup> The pathogenesis of essential hypertension is not clear and very difficult to understand. In present era, people are breathing under various stresses, anxiety and unnatural food habits.<sup>[7]</sup> This type of lifestyle produces a lot of health issues in the form of psycho-physiological disturbances and hypertension is one of them.<sup>[8]</sup> Hypertension is more

common in some ethnic groups, particularly in American Blacks and Japanese, and approximately 40-60% is explained by the genetic factors.<sup>[9]</sup> It may also be caused by some environmental factors include high salt intake, stress, heavy consumption of alcohol, obesity, lack of exercise and impaired intrauterine growth etc.<sup>[10]</sup> Since Essential Hypertension is usually asymptomatic and requires lifelong treatment, as a result, only 70% of these people become aware that they have elevated Blood Pressure, only 59% are being treated, and only 34% have well controlled BP.<sup>[11]</sup> The sustained high BP due to undiagnosed, untreated or sub-optimally treated hypertension leads to the target organ damage.<sup>[12]</sup> Epidemiological data indicate that Essential Hypertension is a major modifiable risk factor for stroke, coronary heart disease, congestive heart failure and renal failure and also for all clinical manifestations of atherosclerosis.<sup>[13]</sup>

In *Ayurveda*, Hypertension is not described in any *Grantha's* and *Samhita's*, so the exact co-relation is difficult to find out.<sup>[14]</sup> So in *Ayurveda*, the disease can be explained on the basis of *Dosha*, *Dushya*, *Strotas*, *Lakshana* and can be correlated with *Raktagata vata*. According to Ayurveda, Vyan vayu are responsible for blood circulation and for high blood pressure, vitiated

vyana vayu is mainly responsible.<sup>[15]</sup> In hypertension all the three doshas i.e Vata, Pitta and Kapha gets involved.

In this condition, in circulating *rakta dhatu* vitiated *vata dosha* gets lodged and causes disturbance in its circulation.<sup>[16]</sup> Since *rakta dhatu* and *pitta dosha* are related in an inseparable relationship, thus the distribution of *rakta* also leads to the distribution of *pitta*.<sup>[17]</sup> In this context, *rakta gata vata* is basically a disorder of blood i.e *rakta dhatu prakopa* caused by morbid *vata* and *pitta dosha*.<sup>[18]</sup> The *kapha dosha* will also be disturbed leading to loss of support and veracity to the cardiac functions.<sup>[19]</sup> Pathologically when the *avalambhaka kapha* increases, they cause blockage in the arteries and arterioles leading to atherosclerosis and peripheral resistance.<sup>[20]</sup> This can also cause disturbance in circulation which further cause *Rakta gata vata*.

So the management of Essential Hypertension can be a great challenge for allopathic as well as *ayurvedic* medical science because of its unknown etiology, difficulty in early diagnosis and chronicity of the disease. In modern medicine, there are various drugs available for controlling blood pressure eg.  $\beta$ -Blockers, calcium channel blockers and diuretics etc. but long usage of

these drugs may have many side effects. Hence, it is need of time to prevent and manage the disease and to avoid further hazards or complications.<sup>[21]</sup> *Ayurveda* provides holistic approach for the management of the disease. *Shirodhara* is a classical and a well-established *ayurvedic* procedure which can be used for treating the essential hypertension.

### Hypertension

Hypertension is defined as abnormally high arterial blood pressure. According to the Joint National Committee 7 (JNC7), normal blood pressure is a systolic BP < 120 mmHg and diastolic BP < 80 mmHg.<sup>[22]</sup> Hypertension is defined as systolic BP level of  $\geq 140$  mmHg and/or diastolic BP level  $\geq 90$  mmHg.<sup>[23]</sup> Although majority of hypertensive patients remain asymptomatic, some people with hypertension may have headaches, vertigo, lightheadedness, fainting episode or altered vision etc.<sup>[24]</sup>

The grey area falling between 120–139 mmHg systolic BP and 80–89 mmHg diastolic BP is defined as “Pre-hypertension”.<sup>[25]</sup> Although Pre-hypertension is not a medical condition in itself, but pre-hypertensive subjects are at more risk of developing Hypertension.<sup>[26]</sup>

### Classification of Hypertension<sup>[27]</sup>

CATEGORY	SYSTOLIC (mm Hg)	DIASTOLIC (mm Hg)
Normal	<120	<80
Pre hypertension	120 to 139	80 to 89
Hypertension	>140	>90

### Stages of Hypertension<sup>[28]</sup>

STAGES	SYSTOLIC (mm Hg)	DIASTOLIC (mm Hg)
STAGE 1	140 to 159	90 to 99
STAGE 2	$\geq 160$	$\geq 100$

### Essential Hypertension

More than 95% of patients have no identifiable underlying cause of hypertension and therefore they are said to have essential or idiopathic hypertension.<sup>[29]</sup> It is also known as primary hypertension and its occurrence is probably multifactorial.

Some predisposing factors are

#### Role of genetics

Epidemiological studies suggest that 20-60% of those with essential hypertension, another member of the family is affected and genetic factors may be the cause.

#### Age and Sex

Almost all surveys show that blood pressure rises with age in both men and women. In adult women, BP is lower than in men of comparable age, but the rise is more steep thereafter and around middle-age BP is about the same; in latter life it is higher in women.<sup>[30]</sup>

### Environmental Factors<sup>[31]</sup>

The following factors are implicated in pathogenesis of essential hypertension:-

- Obesity (high BMI)
- Cigarette smoking, Alcohol intake
- High sodium intake
- Stress, anxiety
- Drugs e.g. Non steroidal anti-inflammatory
- Physical inactivity – Sedentary individuals have a 20% to 50% increased risk of developing hypertension<sup>[32]</sup>

### Shirodhara

*Shirodhara* is an ancient *Ayurvedic* therapy described by *Vagbhata* in *Ashtang hridaya sutra sthan* and *Kasture* in *Ayurvedic Panchakarma vinyan*. It is also described in other books of *panchkarma*. The etymology of the word *Shirodhara* is from ‘*shira* = head’ and ‘*dhara* = a steady flow’ which means pouring any liquid on the head in a steady flow. It is a form of *Snehana* procedure. It is a process in which medicated oil, milk, buttermilk or

*kwath* is poured in a continuous stream on the head, especially on the forehead from a specific height and specific period continuously and rhythmically.<sup>[33]</sup> Depending upon the drug components *dhara* is known by different names like *Takradhara*, *Tailadhara*, *Kshiradhara*, *Kwathdhara* and *Jaladhara*.<sup>[34]</sup> This procedure induces a relaxed state of awareness and results in a dynamic psycho-somatic balance. Medicated liquid used for *shirodhara* can be taken according to the disease and individual need of the patient. *Taila dhara* is one of the variety of *shirodhara* which is considered specifically effective in various disorders where *vata dosha* play a predominant role and *raktagata vata* is a *vata* and *rakta pradhana* disease so it will be effective in this disease.<sup>[35]</sup> Acharya Vagbhata has described it under the 'Seka' which is a type of *Murdha taila* and Acharya Charaka and Sushruta stated its use in various type of *shiroroga* like *pittaja shiroroga*, *shankhaka roga*.<sup>[36,37,38]</sup> The pressure of oil on to the forehead creates a vibration and then the oil saturates the forehead and scalp and penetrates into nervous system.<sup>[39]</sup> Gentle pressure and soothing warmth of the oil allows the body, mind and nervous system to experience a deep state of relaxation.<sup>[40]</sup>

Looking at Essential Hypertension from this perspective, we can use *Brahmi taila* for *shirodhara*. In the pathogenesis of this disease we can assume that vitiated *vata dosha* and *rakta dhatu* are the main cause. *Pitta* and *kapha* dosha complement the effect of vitiated *vata* and support in the progression of disease with *Rasa*, *Rakta* being the main mediator of vitiation and this suggests the involvement of *Tridosha* in this disease.<sup>[41]</sup> *Shirodhara* by using *Brahmi taila* will be useful in breaking the pathogenesis of the disease because *Brahmi* (*Bacopa monnieri*) itself is a *medhya*, *rasayana* and *kaphavata shamaka* which is specifically used in *nidravikara* (sleep disorders) and *manoroga* (psychiatric disorders).<sup>[42]</sup> *Brahmi taila* has *bhrumhaniya* (nourishing), *medhya* (nootropic), *rasayana* (rejuvenative), *medohara* (anti-dyslipidemic), *nidrajanana* (sleep promoting), *shothahara* (anti-inflammatory), *chittowegahara* (anxiolytic) and *hrudya* (cardiotrophic) properties.<sup>[43]</sup> *Shirodhara* is also a purifying and rejuvenating therapy designed to eliminate toxins and mental exhaustion and pacifies the aggravated *Vata Dosha* in *Shira* and balancing the *Prana Vayu* and *Vyana Vayu* around the head.<sup>[44]</sup> *Vyana Vayu* itself is responsible for circulation of blood in the body, so we can say that *Shirodhara* by *Brahmi taila* will be effective for hypertension.<sup>[45]</sup>

**After treatment** –Cover the head and rest for at least one hour and wait for 2-3 hours before rising the oil out of the hair to allow for the full effect of treatment.<sup>[46]</sup> Avoid cold breezes, hot sun, exercise and travelling for rest of the day.

### Probable Mode Of Action Of *Shirodhara* By *Brahmi Taila*

According to *Ayurvedic* classics, *shirodhara* is beneficial for *Vata* and *Pitta dosha*.<sup>[47]</sup> The action and qualities of the liquid used in *shirodhara* counters the effects of imbalance *doshas*. It soothes, nourishes and pacifies the *doshas* through the application of liquid to the forehead, scalp and nervous system.<sup>[48]</sup> In the procedure of *Shirodhara*, a particular pressure and vibration is created over the forehead and this vibration is amplified by hollow sinus present in the frontal bone.<sup>[49]</sup> The vibration is then transmitted inwards through the fluid medium of the cerebrospinal fluid (CSF) and thus this vibration along with little temperature may activate the functions of thalamus and basal forebrain which then brings the amount of serotonin and catecholamine to the normal stage inducing the sleep.<sup>[50]</sup> Due to continuous and rhythmically pouring of *taila dhara* also lead to state of concentration and enhance the release of serotonin and produces chemical substance like acetylcholine and small amount of acetylcholine causes fall of blood pressure and supine position also helps in relaxation.<sup>[51]</sup>

*Brahmi Taila* is used for *Shirodhara*. *Taila* itself is having the *Vatahara*, *Sukshma* and *Snigdhatva* properties which helps *Tarpaka Kapha* in proper facilitation and sound connection of *Indriyas* and *Vishaya* which was deranged earlier by aggravated *Vata dosha*.<sup>[52]</sup> Due to its *sukshma guna* it easily penetrates in the deep channels inside the body. Active components of *Taila* penetrate into the circulation via forehead and produces *Vatahara* effect and it also produces lubrication and nutrition.<sup>[53]</sup> *Brahmi* is a *medhya* drug which have *rasayana* (rejuvenative), *medohara* (anti-dyslipidemic), *nidrajanana* (sleep promoting), *shothahara* (anti-inflammatory), *chittowegahara* (anxiolytic) and *hrudya* (cardiotrophic) properties along with anti hypertensive effects.<sup>[54]</sup> It also balances the *vata* and *kapha dosha*. Hence, *Shirodhara* facilitates for better working by its *Medhya* effect and the continuous pouring of liquid in relaxed and comfortable position has an additional benefits.<sup>[55]</sup>

Materials used for *Shirodhara* should be comfortably warm which causes vasodilatation of all the channels and thereby improving their circulation which in turn improves the blood circulation of the Brain.<sup>[56]</sup> Improvement in circulation to the hypothalamus also improves the function of Autonomic Nervous System as its stimulation during stress causes many physiological disturbances.<sup>[57]</sup>

By affecting in all these ways, *Shirodhara* by *Brahmi taila* can probably give better results in the Essential Hypertension.

### CONCLUSION

*Shirodhara* is a classical, a well established and an ancient *ayurvedic* procedure of slowly and steadily pouring of medicated oil or other liquids on the forehead.

The oil will be comfortably warm and the process continues for at least 25 minutes. The person experiences unexplainable relaxation and brightness, which provides complete rest to the mind. *Brahmi taila* used for *shirodhara* provides its additional effects like *medhya*, *rasayana*, *medohara*, *nidrajanana*, *shothahara*, *chittowegahara* and *hrudya* properties which allows one to overcome stress related conditions like insomnia, anxiety, chronic headaches, hypertension etc. *Shirodhara* brings in several benefits including improved blood circulation to the brain, reduces nervous tension, and helps in sound sleep and it also provides nourishments to the scalp, strengthen the hair and skin of the head. It improves the functioning of sense organs and central nervous system, also improves the mood and prevents many mental illnesses like depression. Considering all above points, it can be concluded that *Shirodhara* by *Brahmi taila* may be quite effective in management of Essential hypertension.

## REFERENCES

1. Management of Hypertension through Ayurveda: A Review Article by Sukmani Shankar Dhurve, A. K. Burley in 2017 [www.iamj.in/current\\_issue/images/upload/1211\\_121\\_6.pdf](http://www.iamj.in/current_issue/images/upload/1211_121_6.pdf)
2. Sanwariya Rahul Kumar Et; Al: Shirodhara in Management of Hypertension - A Review Article [www.iamj.in/current\\_issue/images/upload/79\\_82.pdf](http://www.iamj.in/current_issue/images/upload/79_82.pdf)
3. Effect of Brahmi vati and Sarpagandha Ghana vati in management of essential hypertension- A randomized, double blind, clinical study by D. Mishra, B.R. Tubaki / Journal of Ayurveda and Integrative Medicine, 2019; 10: 269-276270. <http://dx.doi.org/10.1016/j.jaim.2017.04.001>.
4. Essential Hypertension: Perspectives and future directions by Songcang Chen in [www.ncbi.nlm.nih.gov/pmc/articles/PMC4152852](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4152852), 2014.
5. Essential Hypertension: Perspectives and future directions by Songcang Chen in [www.ncbi.nlm.nih.gov/pmc/articles/PMC4152852](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4152852), 2014.
6. Essential Hypertension: Perspectives and future directions by Songcang Chen in [www.ncbi.nlm.nih.gov/pmc/articles/PMC4152852](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4152852), 2014.
7. Kawale *et.al* : Role of Shirodhara in the Management of Hypertension. World Journal of Pharmaceutical Research, 2020; 9(8).
8. Kawale *et.al* : Role of Shirodhara in the Management of Hypertension. World Journal of Pharmaceutical Research, 2020; 9(8).
9. Davidson's principle and practice of medicine, 19<sup>th</sup> Edition, Chapter, 12: 388.
10. Davidson's principle and practice of medicine, 19<sup>th</sup> Edition, Chapter, 12: 388.
11. Essential Hypertension: Perspectives and future directions by Songcang Chen in [www.ncbi.nlm.nih.gov/pmc/articles/PMC4152852](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4152852), 2014.
12. Essential Hypertension: Perspectives and future directions by Songcang Chen in [www.ncbi.nlm.nih.gov/pmc/articles/PMC4152852](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4152852), 2014.
13. Essential Hypertension: Perspectives and future directions by Songcang Chen in [www.ncbi.nlm.nih.gov/pmc/articles/PMC4152852](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4152852), 2014.
14. Management of Hypertension through Ayurveda: A Review Article by Sukmani Shankar Dhurve, A. K. Burley in 2017 [www.iamj.in/current\\_issue/images/upload/1211\\_121\\_6.pdf](http://www.iamj.in/current_issue/images/upload/1211_121_6.pdf).
15. Management of Hypertension through Ayurveda: A Review Article by Sukmani Shankar Dhurve, A. K. Burley in 2017 [www.iamj.in/current\\_issue/images/upload/1211\\_121\\_6.pdf](http://www.iamj.in/current_issue/images/upload/1211_121_6.pdf).
16. Kawale *et.al*: Role of Shirodhara in the Management of Hypertension. World Journal of Pharmaceutical Research, 2020; 9(8).
17. Kawale *et.al*: Role of Shirodhara in the Management of Hypertension. World Journal of Pharmaceutical Research, 2020; 9(8).
18. Kawale *et.al*: Role of Shirodhara in the Management of Hypertension. World Journal of Pharmaceutical Research, 2020; 9(8).
19. Kawale *et.al*: Role of Shirodhara in the Management of Hypertension. World Journal of Pharmaceutical Research, 2020; 9(8).
20. Kawale *et.al*: Role of Shirodhara in the Management of Hypertension. World Journal of Pharmaceutical Research, 2020; 9(8).
21. Management of Hypertension through Ayurveda: A Review Article by Sukmani Shankar Dhurve, A. K. Burley in [www.iamj.in/current\\_issue/images/upload/1211\\_121\\_6.pdf](http://www.iamj.in/current_issue/images/upload/1211_121_6.pdf), 2017.
22. Prevalence and Associated Risk Factors of Hypertension: A Cross-Sectional Study in Urban Varanasi by Shikha Singh, Ravi Shankar, and Gyan Prakash Singh in [www.hindawi.com/journals/ijhy/2017/5491838](http://www.hindawi.com/journals/ijhy/2017/5491838), 2017.
23. Prevalence and Associated Risk Factors of Hypertension: A Cross-Sectional Study in Urban Varanasi by Shikha Singh, Ravi Shankar, and Gyan Prakash Singh in [www.hindawi.com/journals/ijhy/2017/5491838](http://www.hindawi.com/journals/ijhy/2017/5491838), 2017.
24. Prevalence and Associated Risk Factors of Hypertension: A Cross-Sectional Study in Urban Varanasi by Shikha Singh, Ravi Shankar, and Gyan Prakash Singh in [www.hindawi.com/journals/ijhy/2017/5491838](http://www.hindawi.com/journals/ijhy/2017/5491838), 2017.
25. Prevalence and Associated Risk Factors of Hypertension: A Cross-Sectional Study in Urban

- Varanasi by Shikha Singh, Ravi Shankar, and Gyan Prakash Singh in [www.hindawi.com/journals/ijhy/2017/5491838](http://www.hindawi.com/journals/ijhy/2017/5491838), 2017.
26. Prevalence and Associated Risk Factors of Hypertension: A Cross-Sectional Study in Urban Varanasi by Shikha Singh, Ravi Shankar, and Gyan Prakash Singh in [www.hindawi.com/journals/ijhy/2017/5491838](http://www.hindawi.com/journals/ijhy/2017/5491838), 2017.
  27. Textbook of medicine – Dr. S.N Chugh, 3<sup>rd</sup> Edition, Unit 4, Chapter, 8: 252.
  28. Textbook of medicine – Dr. S.N Chugh, 3<sup>rd</sup> Edition, Unit 4, Chapter, 8: 252.
  29. Textbook of medicine – Dr. S.N Chugh, 3<sup>rd</sup> Edition, Unit 4, Chapter, 8: 252
  30. API Textbook of medicine, 9<sup>th</sup> Edition, Section 12, Chapter, 20: 685.
  31. Textbook of medicine – Dr. S.N Chugh, 3<sup>rd</sup> Edition, Unit, 4(8):: 252.
  32. API Textbook of medicine, 9<sup>th</sup> Edition, Section 12, Chapter 20, Page no. 685
  33. Principles and Practice of Panchakarma by Dr. Vasant C. Patil; Snehana Karma, 162.
  34. Principles and Practice of Panchakarma by Dr. Vasant C. Patil; Snehana Karma, 162.
  35. Sanwariya Rahul Kumar *Et; Al:* Shirodhara in Management of Hypertension - A Review Article [www.iamj.in/current\\_issue/images/upload/79\\_82.pdf](http://www.iamj.in/current_issue/images/upload/79_82.pdf)
  36. Vagbhata, Astanga Hridaya, translated by K.R.Srikantha Murthy, Chaukhamba Publications, 5th edition, 2007, Sutra Sthana, 22nd Chapter, Verse 24,25,26, 520: 273.
  37. Charak Samhita- Uttarardh by Pt. Kashinatha Sastri Dr. Gorakhanatha Chaturvedi: Chaukhamba surbharti Prakashan, 2012.
  38. Sushruta Samhita –Uttartantra by Kaviraj Ambikadutta Shastri A.M.S.; Chaukhamba Sanskrit Sansthan, 2010.
  39. Sanwariya Rahul Kumar *Et; Al:* Shirodhara in Management of Hypertension - A Review Article [www.iamj.in/current\\_issue/images/upload/79\\_82.pdf](http://www.iamj.in/current_issue/images/upload/79_82.pdf)
  40. Sanwariya Rahul Kumar *Et; Al:* Shirodhara in Management of Hypertension - A Review Article [www.iamj.in/current\\_issue/images/upload/79\\_82.pdf](http://www.iamj.in/current_issue/images/upload/79_82.pdf)
  41. Sanwariya Rahul Kumar *Et; Al:* Shirodhara in Management of Hypertension - A Review Article [www.iamj.in/current\\_issue/images/upload/79\\_82.pdf](http://www.iamj.in/current_issue/images/upload/79_82.pdf)
  42. Dravyaguna Vigyan- Part II by P.V. Sharma: Chaukhamba Bharati Academy. Medhyadi varga, 7.
  43. Effect of Brahmi vati and Sarpagandha Ghana vati in management of essential hypertension- A randomized, double blind, clinical study by D. Mishra, B.R. Tubaki / Journal of Ayurveda and Integrative Medicine, 2019; 10: 269-276270. <http://dx.doi.org/10.1016/j.jaim.2017.04.001>.
  44. Shital Bhagiya *et al;* Anti-Hypertensive Effect of Virechana, Basti karma And Shirodhara – A Review [ayurpub.com/wp-content/uploads/2016/08/442-450.pdf](http://ayurpub.com/wp-content/uploads/2016/08/442-450.pdf).
  45. Shital Bhagiya *et al;* Anti-Hypertensive Effect of Virechana, Basti karma And Shirodhara – A Review [ayurpub.com/wp-content/uploads/2016/08/442-450.pdf](http://ayurpub.com/wp-content/uploads/2016/08/442-450.pdf).
  46. Sanwariya Rahul Kumar *Et; Al:* Shirodhara in Management of Hypertension - A Review Article [www.iamj.in/current\\_issue/images/upload/79\\_82.pdf](http://www.iamj.in/current_issue/images/upload/79_82.pdf)
  47. Sanwariya Rahul Kumar *Et; Al:* Shirodhara in Management of Hypertension - A Review Article [www.iamj.in/current\\_issue/images/upload/79\\_82.pdf](http://www.iamj.in/current_issue/images/upload/79_82.pdf)
  48. Sanwariya Rahul Kumar *Et; Al:* Shirodhara in Management of Hypertension - A Review Article [www.iamj.in/current\\_issue/images/upload/79\\_82.pdf](http://www.iamj.in/current_issue/images/upload/79_82.pdf)
  49. Sanwariya Rahul Kumar *Et; Al:* Shirodhara in Management of Hypertension - A Review Article [www.iamj.in/current\\_issue/images/upload/79\\_82.pdf](http://www.iamj.in/current_issue/images/upload/79_82.pdf)
  50. Sanwariya Rahul Kumar *Et; Al:* Shirodhara in Management of Hypertension - A Review Article [www.iamj.in/current\\_issue/images/upload/79\\_82.pdf](http://www.iamj.in/current_issue/images/upload/79_82.pdf)
  51. Shital Bhagiya *et al;* Anti-Hypertensive Effect of Virechana, Basti karma And Shirodhara – A Review [ayurpub.com/wp-content/uploads/2016/08/442-450.pdf](http://ayurpub.com/wp-content/uploads/2016/08/442-450.pdf)
  52. Shital Bhagiya *et al;* Anti-Hypertensive Effect of Virechana, Basti karma And Shirodhara – A Review [ayurpub.com/wp-content/uploads/2016/08/442-450.pdf](http://ayurpub.com/wp-content/uploads/2016/08/442-450.pdf).
  53. Shital Bhagiya *et al;* Anti-Hypertensive Effect of Virechana, Basti karma And Shirodhara – A Review [ayurpub.com/wp-content/uploads/2016/08/442-450.pdf](http://ayurpub.com/wp-content/uploads/2016/08/442-450.pdf).
  54. Effect of Brahmi vati and Sarpagandha Ghana vati in management of essential hypertension- A randomized, double blind, clinical study by D. Mishra, B.R. Tubaki / Journal of Ayurveda and Integrative Medicine 10 (2019) 269-276270 <http://dx.doi.org/10.1016/j.jaim.2017.04.001>.
  55. Shital Bhagiya *et al;* Anti-Hypertensive Effect of Virechana, Basti karma And Shirodhara – A Review [ayurpub.com/wp-content/uploads/2016/08/442-450.pdf](http://ayurpub.com/wp-content/uploads/2016/08/442-450.pdf).
  56. Shital Bhagiya *et al;* Anti-Hypertensive Effect of Virechana, Basti karma And Shirodhara – A Review [ayurpub.com/wp-content/uploads/2016/08/442-450.pdf](http://ayurpub.com/wp-content/uploads/2016/08/442-450.pdf).
  57. Shital Bhagiya *et al;* Anti-Hypertensive Effect of Virechana, Basti karma And Shirodhara – A Review [ayurpub.com/wp-content/uploads/2016/08/442-450.pdf](http://ayurpub.com/wp-content/uploads/2016/08/442-450.pdf).
  58. Ayurvediya Panchakarma Vigyan by Vaidh Haridas Shreedhar Kasture, 2014.