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Ayurvedic Approach of Peripheral Vascular Disease - A Review

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ABSTRACT

Introduction: Peripheral Vascular Disease (PVD) affects the circulatory system of the body. Prevalence of PVD is 12 to 20 % over 60 years which is higher in male and up to 40 % of the people are asymptomatic. In *Ayurveda*, concept of *Sira*, *Dhamani* plays major role in understanding the pathogenesis of the *Dhamani Praticchaya*, *Vataraktha*, *Siragata Vata* and *Siraja Granthi* which can be correlated with Atherosclerosis Obliterans, Thromboangitis Obliterans, Arterial Embolism, Deep Vein Thrombosis, Raynaud's phenomenon, Varicose vein, Aneurysm and Popliteal Aneurysm.

Materials and Methods: *Sira*, *Dhamani*, *Dhamani Praticchaya*, *Vataraktha*, *Siragata Vata* and *Siraja Granthi* references are taken from *Samhita*. Various articles and case study taken from e-source is critically analysed in correlating PVD with above mentioned diseases and better treatment modalities.

Result and Discussion: *Dhamani Praticchaya*, *Vataraktha*, *Siragata Vata* and *Siraja Granthi* can be correlated with Atherosclerosis Obliterans, Thromboangitis Obliterans, Arterial Embolism, Deep Vein Thrombosis, Raynaud's phenomenon, Varicose vein, Aneurysm and Popliteal Aneurysm. In *Vataraktha*, due to *Sanga* vitiated blood stays and causes discolouration, in the same way, in DVT and Aneurysm with thrombosis have venous back flow of blood due to blood clot which causes discolouration. *Vataraktha* classified into two types based on its site, so its treatment modalities differ from each other. Efficacy of *Manjisthadi Kshara Basti* in *Vataraktha* is mentioned through case study.

Conclusion: *Dhamani Praticchaya*, *Vataraktha*, *Siragata Vata* and *Siraja Granthi* are correlated with specific PVD. Life style modification and healthy food habits helps in the prevention of PVD.

Key Words *Ayurveda*, *Dhamani*, *Peripheral Vascular Disease*, *Sira*, *Treatment*

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INTRODUCTION

Peripheral Vascular Disease (PVD) is a circulatory disorder which causes narrowing of blood vessels to all parts of the body other than the brain and heart¹. It is characterised by a reduction in blood flow and oxygen through the peripheral vessels. When the oxygen need of the

tissues exceeds the supply, areas of necrosis and ischemia will develop². There are two types of PVD – Functional and Organic. Functional PVDs doesn't involve defects in blood vessel structure but often related to spasm which may come and go (Raynaud disease). Organic PVDs are caused by structural changes in the blood vessels that

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could include inflammation and tissue damage (Peripheral Artery Disease)¹. Prevalence of PVD is 12 to 20 % over 60 years which is higher in male and up to 40 % of the people are asymptomatic³.

Atherosclerosis Obliterans, Thromboangitis Obliterans, Arterial Embolism, Deep Vein Thrombosis, Raynaud's phenomenon, Varicose vein, Aneurysm and Popliteal Aneurysm comes under PVD².

MATERIALS AND METHODS

Information related to *Sira*, *Dhamani*, *Dhamani Praticchaya*, *Vataraktha*, *Siraghata Vata* and *Siraja Granthi* are collected from classical literature and correlating aspects from contemporary articles. Collected data was analysed by considering the updated information from e-resource.

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Sira and Dhamani

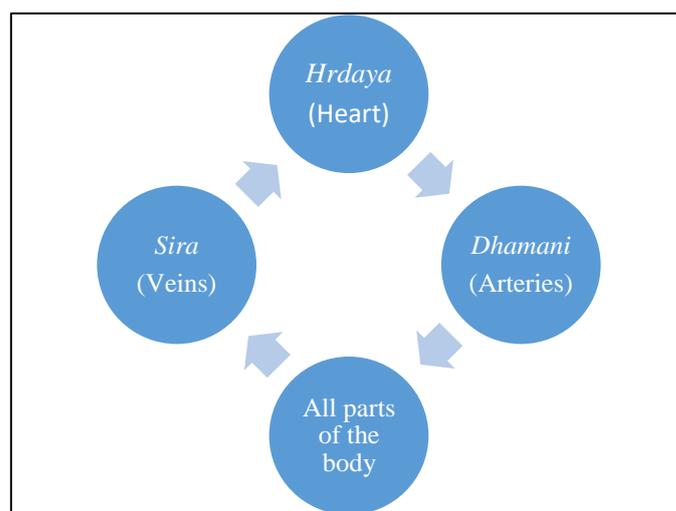
According to *Acharya Sushruta*, *Siras* (Veins) originate from the umbilical region and from there spread all over the body upwards, downwards and obliquely. There are 700 *Siras*. Among them, 40 *Siras* are considered as *Mula Siras* in our body⁴.

Acharya Charaka mentioned it as *Dhamanadhamanyah* means *Dhamani* (Arteries) are the pulsatile tubular structures which produce sound. As the foetal artery and foetal vein develops from *Nabhi*, *Acharya Susrutha*

mentioned it as *Nabhiprabhava*⁵. According to *Acharya Sushruta*, there are 24 *Mula Dhamanis*. Among them, ten have upward course (*Urdwa Dhamani*), ten have downward course (*Adho Dhamani*) and four run transversely (*Triyak Dhamani*)⁴.

Urdwa Gamana Dhamani sustains and maintain the integrity above the umbilicus such as abdomen, sides, back, chest, neck, shoulders and arms. These can be correlated to arteries supplying blood to upper part of the body.

Adho Gamana Dhamani maintains the integrity of parts of the body below the umbilicus such as large intestine, waist, stool and urine, organs of generation, anus, bladder and lower limbs of the body. These can be correlated to the arteries supplying blood to lower part of the body⁵. *Sira* and *Dhamani* in circulation of blood is depicted in flowchart no. 1⁴.



Flow chart no. 1 *Sira and Dhamani* in Circulation of blood

Dhamani Praticchaya, *Vatarakta*, *Siragata Vata*, *Siraja Granthi* are the diseases caused because of *Dosha* getting lodged in *Sira* and *Dhamani* gives

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more clear view regarding clinical symptoms, differentiation, treatment and management and can be correlated with diseases which comes under PVD.

Signs and symptoms of these diseases will have one or more of the following phenomena.

- 1) *Atipravruthi* - Excess flow of blood due to vasodilation like in excessive bleeding, swelling.
- 2) *Sanga* - Accumulation of aggravated *Medas* gets adhered to the arterial wall of the blood vessels causing narrowing of the lumen as in *Dhamani Prathichaya*.
- 3) *Granthi* - Leads to the consolidation or thickening of the blood vessels as seen in varicose vein.
- 4) *Vimarga Gamana* - Change in the direction of the normal flow of blood due to obstruction in *Srothas*.

Most of the diseases occurs in the *Srothas* based on the *Atipravrutti*, *Sanga*, *Granthi* and *Vimarga gamana*. *Dhamani Prathichaya* can be caused by disturbance in *Srothas* (pathway) which can be identified with *Nidana* and *Samprapthi* of the disease.

1. *Dhamani Prathichaya*

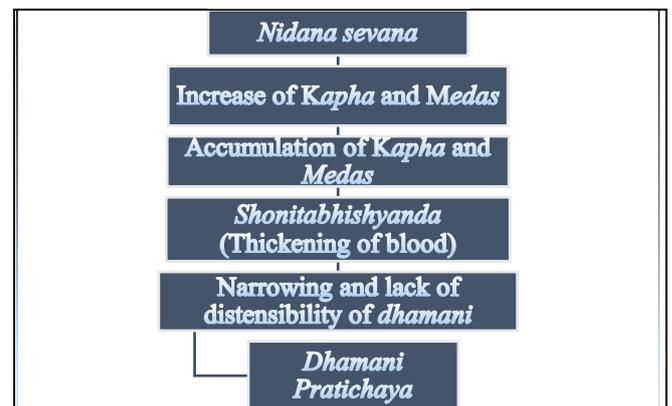
According to *Acharya Charaka*, *Dhamani Prathichaya* is mentioned under one among the 20 *Kaphaja Nanatmajavikara*.

Nidana (Causative factors)

Ahaara - *Madhura*, *Amla*, *Lavana Rasa* (Sweet, sour and salt taste), *Guru*, *Snigdha*, *Sheeta*, *Vidahi*, *Abhishyandi Guna*.

Vikara - *Atimatrashana* (More food intake), *Vegadharana* (Suppression of urges), *Avyayama* (Sedentary lifestyle) and *Vyasana* (Addictions)⁶.

Samprapthi (*Pathogenesis*) are shown in flowchart no. 2⁷.



Flow chart no. 2 *Samprapthi* of *Dhamani Prathichaya*

Chikitsa (Treatment)

In *Ayurveda*, first line of treatment for all the diseases is *Nidana Parivarjana* (Avoiding all the causative factors). As *Kapha* is mainly involved in this disease, *Kapha Dosha Chikitsa* can be adopted⁶.

Administration of *Teekshna Vamana* and *Virechana* (Vigorous emesis and purgation), intake of food which is *Ruksha* (Dry), *Ushna* (Hot) having *Katu*, *Tikta* and *Kashaya Rasa*, old beverages, sexual intercourse till contentment, remaining awake at night, various types of exercise, and *Vimardana* (Dry massage without applying oil) are the various treatment procedures for *Kapha Dosha*.

Emesis, *Yusha* (Vegetable soup), *Madhu* (Honey), *Medoghna Aushada* (Lipolytic drugs), *Dhumapana* (Smoking herbal sticks), *Upavasa* (Fasting), *Gandusa* (Holding medicinal

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decoctions in oral cavity) constitutes specific therapeutic procedures for *Kapha Dosha* can be carried out in this condition⁸.

Karma which may be beneficial in *Dhamani Prathichaya* includes *Snehana*, *Swedana*, *Lekhana*, *Chedana*, *Pramathi* and *Vayasthapana*.

Snehana

Abhyanga considered as *Bahya Snehana* which helps to dilate the superficial blood vessels and increase the blood flow. *Abhyanga* with more pressure increases the venous return and cardiac stroke volume. If done unilaterally, it helps to decrease the viscosity of blood and leads to haemodilution.

Swedana

Swedana increases temperature in the body that creates vasodilation in blood vessels by supplying oxygen. There are two types of *Swedana* – *Sagni* and *Niragni*. *Swedana* also gives relief from stiffness, heaviness and coldness⁷.

Lekhana

Drugs having *Lekhana Karma* mainly dries up and scrapes *Dhatu*, *Mala* resulting in lean body. *Dalhana* comments that *Lekhana Dravya* mainly acts on *Kapha Dosha* and *Meda Dhatu*. *Kshoudram*, *Ushnajala*, *Vacha*, *Yava* is considered as most important *Lekhaniya Dravya* according to *Sarangadhara Samhita*. According to *Acharya Charaka*, *Musta*, *Kusta*, *Haridra*, *Darumaridra*, *Vacha*, *Ativisha*, *Katurohini*, *Chitraka*, *Chirubilwa*, *Hemavathi* has the property of *Lekhana* and it is mentioned under

Lekhaniya gana. These drugs will be helpful in *Dhamani Prathichaya*.

Chedana

Chedana Dravya act on adhered *Dosha*, and separates or disunites them, eradicates or uproots forcefully out of the body. *Kshara*, *Maricha* and *Shilajathu* is considered as best *Chedaniya Dravya* according to *Sarangadhara Samhita*. According to *Acharya Charaka*, *Hingu Nirayasa* is the *Agrya* (Best) *Chedaniya Dravya*⁹.

In research, drugs possessing *Lekhana* and *Chedana Karma* may have antithrombotic action.

Pramathi

Pramathi Dravya expels accumulated *Dosha* and *Mala* from various *Srothas*. According to *Sarangadhara*, *Maricha* and *Vacha* is considered as the best *Pramathi Dravya*.

Vayasthapana

Drugs which prevent aging is considered as *Vayasthapana Dravya*. According to *Acharya Charaka*, *Amalaki* is the *Agrya* (Best) for *Vayasthapana Dravya*⁷.

Acharya Charaka has also mentioned drugs under *Vayasthapana gana* (one of the 50 *Mahakashaya*). They are *Amrita*, *Abhaya*, *Dhatri*, *Muktha*, *Sweta*, *Jivanti*, *Atirasa*, *Mandukaparni*, *Sthira*, *Punarnava*⁹.

Haridra, *Pippali*, *Harithaki*, *Kumbhi*, *Manjishtha*, *Vidarikanda*, *Kalamegha*, *Guggulu*, *Ardraka* are found to have potent anti-platelet aggregation bioactivity.

Ahaara

In *Charaka Samhita*, *Katu Rasa* is considered as the *Shonita Sanghatha Bhedana*.

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According to the research, *Amalaki* extract increases the production of nitric oxide which helps to maintain the normal blood flow⁷.

Prevention

Dhamani Prathichaya may be prevented by regular *Vasanthika Vamana* in *Kapha Prakruti* persons as *Vasanta* is the natural time of *Kapha Prakopa*. *Snehana* and *Swedana* will bring *Dosha* into *Mahasrotas* may be considered as gastrointestinal tract. Then this can be removed by emesis therapy.

The best diet includes *Mudga Yusha*, cooked sprouted *Mudga*, cows' milk. Regular exercise helps to reduce body fat. Patient suffering from *Dhamani Prathichaya* can consider food having *Katu* and *Tiktha Rasa* as diet⁶.

Dhamani Prathichaya can be partially correlated to Atherosclerosis obliterans, Thromboangitis obliterans, Arterial embolism.

Atherosclerosis obliterans

Atherosclerotic narrowing or obstruction of the inner and middle layer of the artery. Most common arterial obstructive disease occurs in the extremities especially lower extremities. Common sites of disease are femoral artery, iliac arteries and popliteal arteries. In diabetes mellitus patients, the disease becomes more progressive, affects the smaller arteries and often involves vessels below the knee.

Thromboangitis obliterans (TAO)

Acute inflammatory lesions and occlusive thrombosis of the arteries and veins. This disease

has a very strong association with cigarette smoking. It commonly occurs in male between 20 to 40 years. This may involve the arteries of the upper extremities (wrist) and usually affects the lower legs, toes, feet.

Arterial embolism

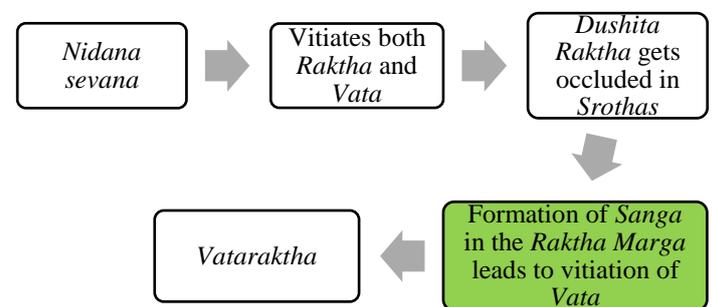
Embolus is a fragment of atherosclerotic plaque loosened from the aorta. Emboli tends to lodge in femoral or popliteal arteries which impairs the blood flow and develops ischemia².

2.Vataraktha

Vataraktha have similar pathogenesis and symptoms with many of the vascular occlusive diseases like Thrombosis, Aneurysm.

Pathogenesis of Vatarakta

Both *Vata* and *Raktha* is vitiated, treatment is given based on this. *Vataraktha* is classified into *Utthana*, *Gambira* and *Ubhayashrita Vataraktha* according to the site of pathogenesis¹⁰. Pathogenesis of *Vatarakta* is mentioned in flowchart no. 3.



Flow chart no. 3 Pathogenesis of *Vatarakta*

- *Uttana Vatarakta* – If *Twak* and *Mamsa* are involved, symptoms such as itching, blackish

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discolouration of skin, burning sensation and painful movements are perceived.

- *Gambira Vatarakta*- If all the *Dhathu* are involved in the pathogenesis, symptoms such as oedema, severe pain, joint pain, stiffness, numbness and deformity in joints are perceived.
- *Ubhayashrita*- All the signs and symptoms mentioned above are present here.

Treatment principle for *Utthana Vatarakta* includes *Aalepana*, *Abhyanga*, *Parisheka* and *Upanaha*.

Gambira Vatarakta treatment includes *Shodana Chikitsa* like *Virechana*, *Aasthapana basti* and *Sneha Basti*¹¹. *Acharya Sushruta* mentioned *Nirantara Rakthamokshana* that it should be done several times and *Shodana* done to expel the *Dosha* vitiated. If the accumulated *Dosha* affect deeper tissues therapies like *Parisheka*, *Rakthamokshana*, *Basti Karma* along with *Shamana Aushadies* can be given for pain management. *Rakthamokshana* with *Jalaukavacharana* can be done very effectively depending upon on the condition¹⁰.

Sixty-five-year-old male patient diagnosed as Popliteal Artery Aneurysm with complete thrombosis was managed with ayurvedic treatment for 2 months. No symptomatic relief in first 2 weeks then gradually his condition improved and showed good result. Following are the treatment prescribed for him.

- *Parisheka* with *Dhanyamla*, *Madhyastiyadhi Taila*, *Guloochyadi Kashaya*

adopted to reduce numbness, local inflammation and discolouration of foot.

- *Jalaukavacharana* (leech therapy) acts as thrombolytic, anticoagulant, vasodilator and anti-inflammatory effect by sucking toxins and blood impurities. Saliva of leech contains hirudin which inhibits the thrombus formation and dissolves the fibrin clots. It also helps in pain management and burning sensation. *Jalaukavacharana* done at regular interval of days.

- *Matra Basti* is type of *Sneha Basti* in which minimal amount of *Sneha* is given to the patient through anal route. In this case, *Sahacharadi Mezhukupakam* is given as *Matra Basti* twice daily helps in reducing discolouration, pain and burning sensation in lower limb.

Internal medicines prescribed in this case are as follows.

- *Maharasnadhi Kashayam*- Which helps in pain management and prescribed in *Vata Vyadhi*.
- *Chandraprabha Guggulu* – Helps in *Pada Vidaha Avastha*.
- *Kaisora Guggulu* – Helps in *Raktha Shodhaka*, *Raktha Vardhaka*.
- *Shilajathu Rasayana* is considered as *Agrya* in many non-curable diseases as it clears channels and may have thrombolytic action.
- *Shilajathu Rasayana* with *Varanadi Kashaya* acts as *Antavidradhinashana*¹². *Chakradutta* mentioned *Kshara Basti* and *Manjisthadi Kwatha* is mentioned by *Sharangadhara* in *Vatarakta*.

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A male patient of thirty-six-year-old diagnosed with Thromboangitis Obliterans of 40% narrowing of common femoral artery lumen was treated with *Manjistathadi Kshara Basti* gave good result.

Kala Basti is a type of *Basti* which is done for 16 days with combination of *Niruha* and *Anuvasana*. *Anuvasana Basti* is given with *Ksheerabala Tailam* after meals and *Niruha Basti* is given with *Manjisthadi Kshara Basti* containing *Saindhava*, *Guda*, *Shatapuspa Kalka*, *Ksheera Bala Taila*, *Manjisthadi Kwatha*, *Gomutra* and *Dhanyamla* with empty stomach on morning. *Gomutra* acts on *Kapha*, *Manjistha* with *Tridosahara* and *Rakthaprasadaka* action in the form of *Manjisthadi Kwatha* having *Tikta*, *Katu Rasa* and *Ushna Guna* acts on *Pitta* and *Raktha* becomes effective in the management of Thromboangitis Obliterans¹³.

According to *Ayurveda*, pain is mainly due to *Vata*, burning sensation is due to *Pitta* and pus due to *Kapha*. *Panchavalkala Kashaya Avagahana* acts as *Shothahara*, *Vranaropana* and *Vranaprakshalana*. *Jatyadi Tailam* applied over the external wound acts as *Snehana* and *Taila Pichu* with *Haridra* acts as cleansing, healing, antiseptic and soothing effect.

Other internal medications mentioned in *Bhaisajya Ratnawali* is as follows:

- *Harithaki Prayoga* – *Haritaki Churnam* with equal part of *Guda* and *Guduchi Swarasa* made into *Kwatha* is effective in *Janugata Vataraktha*.

- *Shampakathi Kwatha* – *Shampaka*, *Amrutha*, *Vaasa* with *Eranda Taila* made into *Kwatha* helps in *Sarvanga Vataraktha*.

- *Guduchi Prayoga* - *Kashaya* processed with *Guduchi Swarasa*, *Kalka*, *Churna* taken early in the morning beneficial in *Vataraktha*.

- *Patoladi Kwatha* – Helps to reduce *Daha* in *Vataraktha*.

- *Erandadi Kwatha* – Effective in *Vataraktha*.

- *Kokilaksha Kashayam* – *Kashaya* prepared with *Kokilaksha*, *Amrutha*, *Pippali churna* is added as *Prakshepaka Dravya*. Patient should follow *Pathya* while taking this *Kashaya*.

- *Ashwastha Kashaya* – *Ashwatha Twak Kwatha* with *Madhu* checks *Tridoshaja Vataraktha*.

- *Trivritadi Kashaya* – *Kashaya* made with *Trivrit*, *Vidari Kanda*, *Gokshura* taken in equal quantity checks *Vataraktha*.

- *Guda Ghrita*- Suppresses *Vataraktha*.

- *Guduchi Kwatha* with *Eranda taila* - Effective in *Vataraktha*.

External

- *Tila Pralepa* – *Tila* with *Payas* is made into paste and applied.

- *Godhuma Churna* with *Aja Payas* and *Ghrita* can be applied.

- *Ghriha Dhoomadi Pralepa*, *Rasnadi Pralepa*, *Baladi Pralepa* can also be used¹⁴.

Deep vein thrombosis

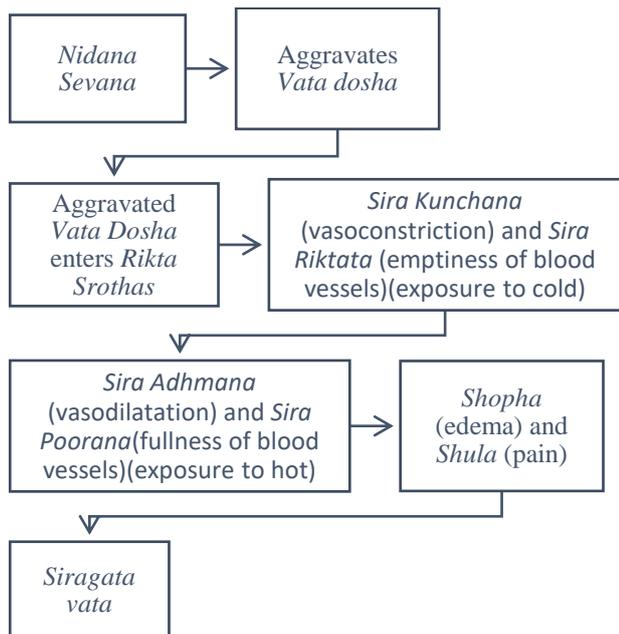
Deep vein thrombosis is a condition in which blood clot forms in bifurcation of the deep vein (Sites of turbulent blood flow) inside the

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body. It typically forms in thigh or lower leg, but they also develop in other areas of the body².

3. Siragata Vata

One of the *Vata Vyadhi* mentioned by *Acharya Charaka*. Pathogenesis of *Siragata Vata* mentioned through flowchart no. 4.



Flowchart no. 4 Pathogenesis of *Siragata Vata*

Chikitsa of *Vata Dosha* and *Vata Vyadhi* can be applied in this disease¹⁵.

Vata Dosha Chikitsa

Sneha (Unctuous), *Sweda* (Sudation), mild *Shodana* (Elimination therapy), taking food having *Madhura*, *Amla*, *Lavana Rasa* and *Ushna Guna*, *Abhyanga* (Oil massage), *Mardana* (Powder massage), *Veshtana* (Bandages), *Trasana* (Shock), *Seka* (Irrigation), beverages such as *Paistika* (Prepared from flour of grains like rice) and *Gaudika* (Prepared from jaggery), administration of *Vasti* (Enema) which is *Snigdha* and *Ushna*, *Vastiniyama* (Habitual intake of *Vasti* in specific order) . *Sneha Dravyas* of various origin prepared with drugs of *Deepana*

(*Carminatives*) and *Pachana* (*Digestive*) comprise the various therapeutic tools of *Vata Dosha*. Intake of meat and meat soup which is *Medhya*, use of *Taila* and administration of *Anuvasana Basti* comprise its specific management⁸.

Vata Vyadhi Chikitsa

Ample amount of *Sneha* can be taken till the satisfaction is attained. *Sarpi*, *Taila*, *Vasa*, *Majja* along with milk, *Yusha*, *Gramyambuja Anuparasa* can be prescribed. *Payasa* and *Krishara* can be taken. *Amla Lavana Anuvasana Basti* can be given. *Navana Nasya*, *Snigdha Sweda* is beneficial. *Swedana* especially *Nadi*, *Prasthara*, *Sankara* is effective¹¹.

- *Abhyanga* - Helps to relax the muscles and blood vessels by improving stiffness in muscles and vasoconstriction. *Abhyanga* with property of *Pustikara* improves blood circulations, tissue perfusion, and eliminates obstructions in micro vessels.
- *Aalepana* - Helps in reducing localized pain and inflammation, wound healing and suppresses burning sensation in skin.
- *Snehana* - Due to its *Vata Hara* property and *Vinihanti Sanga* (Clears obstruction in *Srothas*), it eliminates obstruction and improves circulation.
- *Swedana* - Due its *Srotho Nirmalatva* (purification of *Srothas*) and *Mardaba* (relaxation), it reduces *Sheeta* and *Shoola* by relaxing the constricted vessels and by improving blood circulation.

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- *Upanaha*- One of the four types of *Swedana* mentioned by *Acharya Sushruta*. It is done by bandaging warm paste of medicines on the affected part which reduces pain and inflammation (Topical analgesics). Mainly of 2 types- *Sagni Upanaha* (Paste applied after heating) and *Niragni Upanaha* (Paste applied without heating).
- *Rakthamokshana* with leech reduces pain and inflammation¹⁵.

Raynaud's phenomenon

Intermittent episodes which small arteries or arterioles of left and right arm constrict causing changes in skin colour and temperature. It may occur due to neurogenic lesions, occlusive arterial disease, connective tissue disease, after trauma. It is characterised by reduction of blood flow to the fingers in both hands manifested by cutaneous vessel constriction and resulting in blanching².

4. *Siraja granthi*

Vata gets aggravated by physical exertion causes *Pidana* (compression), *Sankochya* (contraction) and *Vishoshya* (drying) *Siras* of the affected part leads to elevated and tortuous swelling is considered as *Siraja Granthi*. If the swelling is painful and shifting, then this condition is *Kriccha Sadhya* (cured with great difficulty).

In non-suppurated stage of *Granthi*, it should be treated as swelling. Patient should be given oil or ghee or both or he should be given lard, ghee and oil mixed together (*Trivrita*). *Apehivata* (*Prasarini*) and *Dasamoola* boiled with four

kinds of oleaginous substance (*Sarpi, Taila, Vasa and Majja*) is given¹⁶.

Varicose vein

Dilated, tortuous, elongated and palpable superficial veins seen more common in left lower limb with nocturnal muscle cramps, dull aches, ankle oedema, increased muscle fatigue and feeling of heaviness in the legs¹⁷.

Seventy-four-year-old male patient suffering from varicose with symptoms of dull aching pain in calf region of left leg, swelling in the past 6 months, itching, prominent dilated and tortuous vein.

Treatment was prescribed as *Jalauka Avacharana* once in 7 days for 1 month, *Mahamanjistadi Kashaya* for 4 weeks. Complaints got reduced in the course period of treatment.

Clinical study of varicose vein to evaluate the efficacy of *Virechana* with *Jalaukavacharana*, *Mahamanjisthadi Kwatha* and *Kaishora Guggulu* alongside for 30 days with following treatment.

- *Deepana Pachana*
- *Snehapana*
- *Abhyanga and Swedana*
- *Virechana*
- *Samsarjana Krama*
- *Rakthamokshana*
- *Shamana Aushadi*

After this course of treatment, the condition of the patient got improved. Depending upon the *Rogi* and *Roga Bala*, treatment and its course varies from one patient to another.

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Yoga such as *Halasana*, *Pawanamuktasana*, *Sarvangasana*, exercises such as Cycling, Walking, Swimming and elevation of legs using pillows or any other props can be done to increase the muscle strength and stimulates the blood flow, enhances circulation¹⁸.

Aneurysm

Localized or diffuse enlargement of artery along its course at some point. It can occur when the vessel becomes weakened from congenital vascular disease, infection, trauma or atherosclerosis. Mainly of 3 types- saccular (Involves only part of the artery circumference, it takes the form of a sac or pouch like dilation attached to the artery side), fusiform (Spindle shaped, involves the entire arterial wall circumference) and dissecting (Involves haemorrhage into a vessel wall, which splits and dissects the wall causing a widened of the vessel).

Popliteal aneurysm

Aneurysm that bursts can cause pain behind knee, swelling and bruises. When the aneurysm has a clot some of its escapes down the leg or aneurysm blocks off complete. It can cause a lack of blood flow to the leg causing pain, numbness, coldness, muscle weakness and skin paleness¹².

RESULTS AND DISCUSSION

Sira and *Dhamani* plays a major role in the circulation of blood. *Atipravrutti*, *Sanga*, *Granthi*, *Vimarga Gamana* leads to *Dhamani Prathichaya*,

Vataraktha, *Siragata Vata* and *Siraja Granthi* which can be correlated as PVD.

Dhamani Prathichaya occurs due to *Shonitabhishyantha* (Thickening of blood) and contraction of blood vessel due to vitiated *Kapha* which occurs mainly in arteries⁶. This can be correlated with Atherosclerosis Obliterans, Arterial Embolism, TAO as they exhibit less blood flow due to increased cholesterol levels and contraction of blood vessels². *Dhamani Prathichaya* can be effectively treated by *Kapha Dosh Chikitsa*, *Snehana*, *Swedana* and drugs having the *Karma* of *Lekhana*, *Chedana*, *Pramathi*, in later stages *Vayasthapana Dravya* can also be used. *Lekhana* and *Chedana Dravya* may have antithrombotic action. *Pramathi Dravya* clears the channels. *Vayasthapana Dravya* have potent anti-platelet aggregation bioactivity. But these *Karmas* are need to be explored more in the research⁷.

In *Vataraktha*, due to *Sanga* vitiated blood stays and causes discolouration¹⁰ in the same way, in DVT, Aneurysm with thrombosis have venous back flow of blood due to blood clot which causes discolouration². *Vatarakta* is of two types in which *Gambira Vatarakta* is symptomatically correlated to many PVD. *Gambira Vatarakta* is treated with *Shodana* like *Virechana*, *Asthapana Basti* and *Sneha Basti*¹¹. In case study of Popliteal artery aneurysm patient with thrombosis got better results through Ayurvedic management. Pain, blackish discolouration and numbness were reduced but more research on group of patients is anticipated to provide

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scientific proof¹². Another case report of Thromboangitis Obliterans with 40% narrowing of common femoral artery lumen is treated with *Manjistathadi Kshara Basti* effectively¹³. Many formulations mentioned in *Bhaishajya Ratnawali* can be used for better therapeutic efficacy¹⁴.

In *Siragata Vata*, *Sira* gets constricted due to the vitiated *Vata* which will have discolouration over the region¹¹. Raynaud's phenomenon also possesses blanching over regions due to exposure towards cold causes constriction of blood vessels². *Siragata Vata* can be treated effectively with *Vata Dosha* and *Vata Vyadhi Chikitsa* such as *Abhyanga*, *Aalepana*, *Snehana*, *Swedana*, *Upanaha* and *Rakthamokshana*¹¹. In contemporary, doctors use vasodilator drugs for treatment which may lead to headache, dry mouth, dizziness and harm to other body systems¹⁹. Raynaud's phenomenon can be treated effectively with ayurvedic treatment without any harmful effect¹¹.

Siraja Granthi leads to tortuous swelling¹⁶ which is correlated to aneurysm (Thoracic and abdominal)². Varicose vein symptoms closely resemble with *Siragata Vata*, *Vataraktha*, *Siraja Granthi* in which *Raktha*, *Mamsa*, *Meda* are involved¹⁸. *Siraja Granthi* can be cured by *Abhyantara* and *Bahya snehana*¹⁶.

Case study of Varicose vein management with *Jalaukavacharana*, *Shamana Aushadi* gave better recovery from the condition¹⁸.

For *Dhamani Prathichaya*, *Vataraktha*, *Sira Granthi* and *Siragata Vata*, specific pathogenesis, treatment aspects are available in

Ayurveda can be approached for better therapeutic efficacy. Many of the above-mentioned therapies and medicines play huge role in treatment aspect.

CONCLUSION

Dhamani Prathichaya can be correlated with Atherosclerosis Obliterans, Thromboangitis obliterans, Arterial embolism. *Vatarakta* can be correlated with Aneurysm with thrombosis, Deep Vein Thrombosis, Thromboangitis obliterans. *Siragata Vata* can be correlated with Raynaud's phenomenon. *Siraja Granti* can be correlated with Aneurysm and Popliteal Aneurysm. *Siragata Vata*, *Vataraktha*, *Siraja Granthi* symptoms closely resemble with Varicose vein. PVD can be effectively managed by avoiding causative factors and by adopting Ayurvedic treatment modalities.

In *Dhamani Prathichaya*, best diet includes *Mudga Yusha*, cooked sprouted *Mudga*, cows' milk, *Tikta* and *Katu Rasa Ahara* considered as important diet. *Ayurveda* recommend *Ardha Shakthi Vyayama* in *Vasantha ritu* and *Sheeta Kala* for the persons who have good strength and consumes *Snigda Ahara*⁶. In *Vatarakta*, Soup of *Adhaki*, *Chanaka*, *Masura*, *Mudga* added with *Ghrita* in more quantity should be taken. Milk of cow, buffalo must be included in diet¹⁰. In *Siragata Vata*, *Madhura*, *Amla* and *Lavana Ahara* are considered as *Pathya* as it pacifies the vitiated *Vata*. Smoking is one of the important causes for Raynaud's disease¹⁵. In *Siraja Granti*,

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Vata alleviating diet and *Sarpi, Taila, Vasa, Majja* should be taken in more quantity which acts as *Pathya*¹⁶. Likewise, lifestyle modification and food habits play a major role in the disease condition⁶.

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