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Hirudotherapy: A Parasurgical Approach for Pain Management in Varicose Veins

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ABSTRACT

Objective: The objective of this study was to assess the effectiveness of Hirudotherapy (*Jalaukavacharana*) in the pain management of Varicose veins.

Introduction: The aetiology of venous diseases is still poorly understood. Varicose veins; a problem associated with complaint of aching or cramping pain in the legs along with tiredness, restlessness, burning, throbbing, tingling or heaviness in the legs. Likewise long term varicose veins may cause significant complications like superficial thrombophlebitis, varicose eczema, venous ulcer, lipodermatosclerosis and a risk factor for DVT.

Jalau kavacharana is one of the marvels of Parasurgical procedures explained by *Sushruta*.

Study: A case series of 10 patients with varicose veins and pain as a main complaint were studied. Five settings of *Jalaukavacharana*, with every three day interval were given. Before and after *Jalukavacharana* symptoms were observed. Numeric rating scale was use to analyse the pain score.

Management and Outcome: With all aseptic precautions and as per standards mentioned in *Ayurveda* texts, leech(s) were applied according to the extension of affected part. After 5 settings, it was observed that after *Jalaukavacharana*, the pain and associated symptoms subsided significantly.

Discussion: Leech saliva contains anticoagulant and several other bioactive substances which corrects venous hypertension, reduces vascular congestion; reduce hyperpigmentation, limb girth and oedema. This therapy is believed to work through its ability to restore normal blood flow, prevents pooling of blood in legs by ensuring smooth blood flow from the legs towards the chest. This overall results in reduction of pain and also helps to prevent the complications of varicose veins.

KEYWORDS

Jalaukavacharana, Varicose veins, Para surgical procedure



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INTRODUCTION

Ayurveda the Indian system of medicine comprises of eight different specialities¹ in which *Shalyatantra*, the surgical school of thoughts has got prime importance. *Sushruta* accepted *Rakta* in respect to *dosha*. He gave great importance to *rakta*, and explained that Blood is responsible for the origin of the body, responsible for existence, support and maintenance of the body², hence protected with greatest care, and blood itself is life.

Varicose veins are enlarged, tortuous, widened, twisted veins in the subcutaneous tissues³, can occur anywhere in the body, but are more common in the legs. It is not considered as a serious medical condition. But, they can be painful, uncomfortable and can lead to more serious problems. Patient complains of pain, described as an aching or cramping in the legs, oedema along with tiredness, restlessness, burning, throbbing, tingling or heaviness in the legs and skin changes⁴. Long term varicose veins may cause significant complications like superficial thrombophlebitis, varicose eczema, venous ulcer, lipodermatosclerosis and it can be a risk factor for Deep Vein Thrombosis⁵. Experts says it can be a painful, life altering condition can adversely affect people's everyday life hence should be treated. Various surgical modalities are available

for this but recurrence following surgery is a common, complex and costly problem in vascular surgery.

In *Ayurveda Raktamokshana* is considered as 'Half of all Therapies'⁶ and *Jalaukavacharna* is one of the marvel of Para surgical procedure explained by *Sushruta*. *SushrutaSamhita*, the oldest available manual on surgery has devoted an entire chapter for the description of *Jalauka* and the procedure of *Jalaukavacharna*⁷. Hirudotherapy has been used as an effective therapy for the patients suffering from varicose veins. It provides a safe and effective treatment for managing this condition. Leech saliva contains anticoagulant and several other bio-active substances including prostaglandins, vasodilators, anaesthetics and various proteins. The medicinal leeches, when applied to the part surrounding the varicose veins help to correct venous hypertension, reduces vascular congestion, hyperpigmentation, limb girth and oedema. This overall results in reduction of pain and also helps to prevent the complications of varicose veins. Under this consideration, ten patients were studied and the data were assessed statistically for the result.

Varicose Veins:



Varicose veins are not considered a serious medical condition. But, they can be a painful, uncomfortable and embarrassed condition and can lead to more serious complications. Varicose veins are enlarged, tortuous, widened, twisted veins. It can occur anywhere in the body, but are more common in the legs.

Prevalence of Varicose veins is 35%; severe varicose veins are 10%; chronic venous insufficiency is 8%; ulcer is 2%³.

Risk Factor: Hereditary, Female sex, occupation that demand prolongs standing, immobility, raised intra-abdominal pressure like in sports, tight clothing, pregnancy, raised progesterone level, chronic constipation, and high heels.

Clinical Features:

1. Dragging pain, postural discomfort
2. Heaviness in legs
3. Night time cramps- usually late night
4. Oedema feet
5. Itching
6. Discolouration/ ulceration in the feet/ painful walk

Pathology:

Varicose veins occur due to damage to the valves within these veins due to which there is an increased back-pressure within them. As a result, the blood has to flow from the feet upwards towards the chest against the gravity causing more strain on

the blood vessels. Over a period of time, the veins become lax and tortuous due to the accumulation of blood that tends to pool within them and resulting in their dilation⁸.

Complications:

1. Chronic venous insufficiency
2. Thrombophlebitis – This means inflammations of the wall of superficial veins. The veins become red, swollen and feel like tender cord in the subcutaneous tissue.
3. Varicose eczema – A condition in which the skin becomes discoloured, dry, scaly, flaky and itchy.
4. Lipodermatosclerosis – refers to changes in the connective tissue and skin of lower leg with pain, hardening or thickening of the skin, erythema, small white scarred areas, oedema, leg ulcer and tapering of the legs above the ankles.
5. Venous leg ulcers – they are open, painful sores in the skin, commonly found on or near medial malleolus.
6. Deep vein thrombosis – symptoms are cramping pain and swelling in the leg, and may lead to serious complications like pulmonary embolism.
7. Pigmentation – Particularly appear in the lower part of the leg. From RBC breakdown Haemosiderin deposition occurs which cause brownish to black pigmentation.



Hirudotherapy:

In *Ayurveda Raktamokshana* is considered as 'Half of all therapies'. *Jalaukavacharana* is one of the marvels of parasurgical procedure explained by *Sushruta*. *Sushruta* and *Vagbhata* have devoted an entire chapter for the description of *Jalauka* and the procedure of *Jalaukavacharana*. *Jalauka* is one among *Anushastra* and it is a type of *Ashastra Raktamokshana*.

In *Samhita's* the immensity of *Jalauka* was described as 'As a swan can split up the water from a mixture of milk and water; likewise, a *jalauka* can separate impure blood from the pure and it sucks impure blood only'⁹.

This help to remove the congested blood at the affected site and allow the normal circulation to return to the skin, thus preventing the complications like gangrene, venous ulcer etc. They help to remove the toxic impurities that could worsen the symptoms of the infection and also work as a blood purification therapy.

MATERIALS AND METHODS

Ten patients were selected randomly from the *Shalya* OPD of GACH, Nagpur. The criteria of selection of the cases were based in the symptomatology presented by the patients.

History of patient, Systemic examination and local examination of the affected lower limb were then done in detail.

Local examination of the patients includes:

- **Inspection-** Patient was examined in standing position from above the medial malleolus to above the knees for Tortuous, dilated visible veins, reticular veins, telangiectases
 - localised swelling
 - Skin for eczema & hyperpigmentations
 - Ulcerations.
- **Palpation-**
 - For impulse on coughing at the saphenous opening
 - Tenderness
- **Tests for Varicose veins¹⁰:**
 1. BrodieTredelenburg's test 1
 2. BrodieTredelenburg's test 2
 3. Three tourniquet test
 4. Modified Perthes test
 5. Morrisey's test
 6. Fegan's test

With the help of this, final diagnosis was confirmed and routine laboratory investigations were done.

Following the written informed consent of the patients, they were subjected for the treatment.

Method of Leech Application:

Material-

1. Kidney tray
2. Sterilized gauze, swab and gloves



3. Sterile needle, sterile dispovan 10 ml
4. Normal saline and dressing material
5. Turmeric powder

Leech Application-

- The leeches were purified first by putting them in the water mixed with turmeric for 15 minutes.
- After that leeches were kept in plain water for 5 minutes.
- Then the affected limb of the patient was cleaned thoroughly with plain water.
- The area where maximal dilated, tortuous veins seen was located and the adequate numbers of leeches were applied to the part.
- Then the leech body was covered with wet gauze or thin cotton pad and continuous pouring of fresh water was done.

- After the attachment of leech to the body part, it was allowed to remain safely in that place until fully distended and then detached itself.
- After that the bite site was cleaned with normal saline and then dressing was done by applying some turmeric powder.
- Leeches were purified as the same manner described above.
- Likewise the procedure was repeated on 4th, 8th, 12th and 16th day on same patient.
- I all leeches were applied five times to a single patient.

Parameters of Assessment:

Assessment of severity of varicose veins, pain and tenderness was done on zero, one and second week by following grading system:

Table 1 CEAP classification of severity of varicose veins¹¹

| CEAP Clinical Score | Description | Cosmetic or Medical Varicose Veins |
|---------------------|--|------------------------------------|
| C0 | No visible or palpable varicose veins | No varicose veins |
| C1 | Telangectasia (Thread veins/ Spider veins/ Broken veins) | Cosmetic |
| C2A | Varicose veins without any symptoms (Asymptomatic) | Cosmetic |
| C2S | Varicose veins with symptoms | Medical |
| C3 | Swollen ankle due to varicose veins | Medical |
| C4 | Skin damage due to varicose veins | Medical |
| C5 | Healed venous leg ulcer | Medical |
| C6 | Venous leg ulcer | Medical |

1. Pain Score:

| | | |
|---------------|---|---|
| No Pain | : | 0 |
| Mild Pain | : | 1 |
| Moderate Pain | : | 2 |
| Severe Pain | : | 3 |

2. Local Tenderness:

| | | |
|--|---|---|
| Nil – no tenderness | : | 0 |
| Mild – elicited on much pressure: | | 1 |
| Moderate – elicited on mod. Pressure: | | 2 |
| Profuse – elicited on even slight touch: | | 3 |



Observations were evaluated for the result.

OBSERVATIONS & RESULTS

Table 2 No. of patients as per CEAP classification

| CEAP clinical Score | No. of patients |
|---------------------|-----------------|
| C0 | 0 |
| C1 | 0 |
| C2A | 0 |
| C2S | 5 |
| C3 | 3 |
| C4 | 2 |
| C5 | 0 |
| C6 | 0 |

Table 3 Before Treatment and After Treatment Pain and Tenderness Score in 10 patients

| | Grade | No. of patients | | |
|------------|-------|-----------------------|----------------------|-----------------------|
| | | Before treatment (BT) | First follow-up (AT) | Second follow-up (AT) |
| Pain score | 0 | 0 | 0 | 3 |
| | 1 | 0 | 6 | 7 |
| | 2 | 6 | 4 | 0 |
| | 3 | 4 | 0 | 0 |
| Tenderness | 0 | 1 | 0 | 8 |
| | 1 | 2 | 9 | 2 |
| | 2 | 5 | 1 | 0 |
| | 3 | 2 | 0 | 0 |

Observations:

- Total 10 patients (6 female and 4 male patients) were included in this study.
- According to CEAP clinical scoring-
 - C2S: 5 patients have visible, tortuous varicose veins with symptoms of pain, tenderness and heaviness in limb
 - C3: 3 patients have same complaints mentioned above along with swollen ankle of affected limb
 - C4: along with the above complaints 2 patients have itching and blackish discolouration over feet.
- Before treatment and after treatment (in 1st week and 2nd week) pain and tenderness grading were noted in all 10 patients.
- Before treatment 4 patients complaints of severe pain and 6 patients complaints of

moderate pain whereas After treatment 7 patients complaints of minimal pain and 3 patients showed complete relief.

- Likewise Before treatment 1 patient had no tenderness, 2 patient had mild, 5 patient had moderate and 2 patient had severe tenderness whereas After treatment 8 patients had no tenderness and 2 patients showed mild tenderness.

- After treatment Patient's ankle oedema, itching and hyperpigmentation also get reduced.

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DISCUSSION

Hirudotherapy (*Jalaukavacharna*) is considered as one of the ideal method to expel out the vitiated blood safely, speedily and effectively¹². It is claimed to



be the utmost blood letting therapy because of its safety and high efficacy in the disorders involving the vitiation of blood.

Following facts justify leech application in the management of pain and other symptoms in varicose veins-

- Leech saliva contains:
- Hirudin is a naturally occurring peptide, a potent thrombolytic as well as fibrinolytic agent. It probably increases local circulation which causes decrease in inflammation and ultimately pain reduction.
- Histamine- It is a powerful vasodilator agent present in saliva, which acts as an anti-inflammatory and therefore reducing pain.
- Collagenase and Apyrase: Acts as an inhibitor of platelet aggregation.
- Hyaluronidase: It is the most important acting principle in leech saliva. It help to surge the spread of salivary secretions. The skin penetration becomes easy. Along with its natural properties it also has antibiotic properties.
- Hementin: It is an anticoagulant and a proteolytic enzyme, it degrades fibrinogen and fibrin.
- Antibiotics: The antibiotics are produced by symbiotic bacterium *Aeromonashydrophylla* present in leech saliva.

- Bdelin: It is a Plasmin inhibitor. It checks destruction of tissue and hence is helpful in case of necrosis.

- Hirudotherapy increases the quality of life of patients by exterminating the pain and at same time safeguard the patient from the side effects associated with the uses of analgesics¹³.

- The goal of Hirudotherapy is to produce an adequate venous outflow from the tissue. It not only reduces congestion but also it helps in neogenesis.

- This therapy is supposed to work through its ability to restore the normal blood flow through the veins of the legs. It avoids pooling of blood into the legs by ensuring smooth blood flow from the legs towards the chest.

- It also decreases venous congestion caused due to this condition, helps to prevent oedema in the legs and also boosts the healing of ulcers on the skin overlying the affected site.

- This treatment also helps to avert the complications of varicose veins.

CONCLUSION

Hirudotherapy is significantly effective in pain management in the treatment of varicose veins. Probably, the enzymes and other bioactive compounds present in leech saliva plays a major role in pain management. The administration of



Hirudotherapy in combination with other effective treatment modalities like compression stockings and weight management, especially in the case of obese patients, can provide optimum results for the patients suffering from varicose veins. In this way leech therapy can be an effective, time saving, affordable and acceptable Para-surgical treatment for pain management.



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