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EFFECT OF JALAUKAVCHARANA IN BUERGER'S DISEASE-A CASE STUDY

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Abstract:

Background: A non-atherosclerotic, segmental inflammatory illness of small and medium-sized arteries and veins, Buerger's disease (also known as thromboangiitis obliterans) primarily affects young male smokers and increases the risk of limb loss, ischaemia, and ulcers. An Ayurvedic bloodletting technique called jalaukavcharana (therapeutic leech therapy) has long been utilised to promote local circulation and eliminate polluted blood. The possible clinical effects and safety of jalaukavcharana in a patient with Buerger's illness are investigated in this case study. **Case presentation:** A 45-year-old man with a clinical diagnosis of Buerger's disease complained of rest pain and an 8-week-old, non-healing ulcer on the lateral surface of his right foot. Conservative treatments (vasodilator therapy, analgesics, wound dressing, smoking cessation counselling) only slightly improved the situation. In accordance with conventional aseptic technique, jalaukavcharana was given in three sessions over the course of two weeks at locations close to the ulcer and along distal limbs. **Results:** The patient reported a progressive decrease in rest pain (VAS from 8/10 to 2/10 at 4 weeks) following three sessions of jalaukavcharana. The ulcer showed decreased exudate, granulation tissue development, and a reduction in area (baseline: 4.2 cm^2; 4 weeks:

1.1 cm^2). Doppler readings revealed a partial restoration of distal artery flow patterns, and limb skin temperature and capillary refill time improved. Minor localised bleeding and temporary erythema at the bite locations disappeared without any long-term consequences. No systemic side effects were noted. **Conclusion:** In this one instance, jalaukavcharana seems to be linked to better local wound healing and symptomatic alleviation in a Buerger's disease patient. Enhanced microcirculation, leech saliva's anticoagulant and anti-inflammatory properties (such as hirudin and calin), and local decongestion are all potential explanations. These results are preliminary and suggestive; controlled studies are needed to assess safety, appropriate methodology, and efficacy.

Keywords:

Ayurveda, Jalaukavcharana, Leech therapy, Buerger's disease, Thromboangiitis obliterans, Case study, Ayurvedic therapy.

Introduction:

Segmental, acute, and chronic inflammation and thrombosis of medium-sized and small-sized arteries and veins, with relative sparing of the vessel wall elastic tissue, are the hallmarks of Buerger's disease (thromboangiitis obliterans). Clinically, it manifests as digital ulcers, ischaemic rest discomfort, and, if left untreated, often results in amputations. Smoking cessation, wound care, pain management, vasodilator therapy, and, where practical, revascularisation are the main focusses of conventional management. Thrombo Angitis-Obliterance (TAO) is another name for this chronic illness. According to information provided by Leo Buerger between 1908 and 1924, smoking was most likely a risk factor. [1]. Men between the ages of 20 and 40 are more likely to experience it. In India, peripheral arterial disease affects 45–63% of people. [2].

Etiology

1. **Cigarette smoking:** Smoking directly damages endothelium, resulting in thrombosis and hypercoagulability, upregulating matrix metalloproteinases (such as MMP-1 and MMP-9), and encouraging monocyte adhesion and binding to the endothelial wall of blood vessels. [3].

2. Because of the estrogen-vasodilatation action, it is uncommon in female smokers.

3. poor hygiene and a lower socioeconomic status.

4. **Genetic factors:** HLA association (higher levels of HLA-A9 and HLA-B5) [4].

5. **Autonomic over activity:** Peripheral vasospasm is caused by the sympathetic nervous system being over stimulated.

Pathological Aspect

a. In the early stages, occlusive or mural thrombosis results from polymorph infiltration in all vessel layers.

b. In the advanced stage, thrombus development and re-canalization are caused by cellular infiltrates such as mononuclear cells and epitheloid cell granuloma with Langerhan's giant cells[5].

Clinical features

- Pain due to superficial nodular phlebitis and ischaemic neuritis.
- Intermittent claudication.
- Rest pain, chronic ischemic ulcerations–toe, feet etc [6].
- Tingling and burning sensation in the limb.
- Discoloration (Trophic changes).

Diagnosis: Diagnosis can be made by-

A) Clinical examinations

B) Physical tests

C) Investigations.

A. Clinical Examinations of Buerger's Disease Buerger's Disease

1. Inspection: flattening of the toes' terminal pulp, brittle, flattened, and ridged nails, glossy skin, ulceration, gangrene with distinct boundaries, and muscle atrophy in the limbs.

2. Palpation: Peripheral pulse palpation, tenderness, pitting oedema, gangrene, ulcers, etc.

B. Physical tests:

a. Buerger's Postural Test: lifting the leg by 90 degrees usually keeps it pink, but in cases of severe artery blockage, lifting the leg by less than 30 degrees results in pallor.

b. Capillary Refilling Test: Normally, the limb stays pink, but with ischaemia, it turns pallid after 20 to 30 seconds.

c. Allen's Test (Palpation of Peripheral Pulses): When a young smoker presents with leg ulcers, an abnormal Allen test is strongly predictive of TAO [7].

C. Investigations

- Blood examination, blood sugar, lipid profile etc.
- Plain X-ray–Shows calcified areas in major arteries, mainly lateral branches are involved.
- Echocardiography (ECG).
- Doppler ultrasound.
- Duplex scans (B-mode USG along with Doppler study).
- Arteriography formation of (angiography)-There distinctive small-vessels,collaterals around areas of occlusion known as“corkscrew collaterals (Martorell's sign).
- Plethysmography–Measures the blood flow in the vessels.

Complications

- Blocked leg arteries.
- Increased chances of heart attacks.
- Finger and Toe ulcers.
- Toe and Foot gangrene.
- Amputation of limb.

Jalaukavcharana

In Ayurvedic and some integrative medicine contexts, jalaukavcharana, also known as hirudotherapy (leech therapy), is a type of bloodletting used for conditions including local venous congestion, inflammation, and poor microcirculation. A complex mixture of physiologically active compounds, such as hirudin (a direct thrombin inhibitor), calin (anti-platelet aggregation), bdellins and eglins (anti-inflammatory protease inhibitors), and vasodilators, are secreted by medicinal leeches (such as Hirudo medicinal is and related species). These compounds may work in concert to enhance local perfusion and lessen thrombosis and inflammation. This report presents a case of Buerger's disease managed with adjunctive jalaukavcharana, documenting clinical course, objective parameters, and safety observations.

Type of Jaluaka:[8]

According to their habitat and traits, Jaluka (leeches) are classified into two main groups in Ayurveda: Savisha (poisonous) and Nirvisha (non-poisonous or therapeutic). This classification ensures that only suitable types are used for therapeutic purposes.

1. Savisha Jaluka (Poisonous Leeches)

These leeches are toxic and unsuitable for medical use due to their negative effects. They are typically found in contaminated or dirty water sources, and when they bite, they can release toxic substances.

Characteristics:

found in dirty or sluggish water. darker, often with a brown or black tint. Move slowly and appear unwell. When used on people, it may cause adverse side effects as oedema, inflammation, or pain. **Examples:**

Krishna: Leech with a black hue.

Karbura: Multicolored spotted leech.

Alagarda: Heavy and slow to move.

Indrayudha: A multicolored leech that resembles a rainbow.

Samasarpa: Has patterns on its body and resembles a snake.

Gochandana: Small and shaped like a cow's horn.

2. Nirvisha Jaluka (Non-Poisonous or Medicinal Leeches)

These leeches are safe to use medicinally and are specifically used in Jalaukavacharan. They provide therapeutic advantages and are devoid of toxins because their saliva contains bioactive components.

Characteristics:

found in watery environments including ponds, rivers, and streams. greenish or olive in colour. smaller and more vigorous. As little discomfort as possible should be caused during therapy.

Examples:

Kapila: Leech with an olive or green hue.

Reddish-brown leech, or pingala.

Shankhamukhi: Has a nose that resembles a conch.

Mushika: Small and like a rat.

Pundarikamukhi: Has a mouth that resembles a lotus.

Saubhruka: Found in tiny streams and pristine ponds.

Case Details

A 45-year-old man from Bharvari presented to Shalya Tantra OPD on November 24 in Institute for Ayurved Studies & Research, Kurukshetra, Haryana, India. He had progressive rest pain, and an ulcer on the lateral aspect of the right foot for 8 weeks. No diabetes, no autoimmune disease; routine labs within normal limits.

Patient Information:

- **Age:** 45 years
- **Gender:** Male
- **Chief Complaint:** ischemia, ulceration, and risk of limb loss.
- **Associated Symptoms:** There is some wound swelling, pain, and an odorous discharge.
- **Relevant history:** Twenty pack-years of heavy smoking, progressive rest pain, intermittent claudication for six months, and an ulcer on the right foot's lateral aspect for eight weeks. No autoimmune illness, no diabetes, and regular lab results are within normal ranges.
- **Diagnosis:** Based on distal ischaemia, age, smoking history, and the elimination of systemic atherosclerotic risk factors, thromboangiitis obliterans (Buerger's disease) is clinically diagnosed.
- **Baseline examination**
- Right foot: 2.0 cm × 2.1 cm ulcer with slough and surrounding erythema; cool distal extremity; diminished distal pulses on palpation; capillary refill >4 seconds.
- Pain: VAS 8/10 at rest.
- Doppler: Damped/distal arterial waveforms (record details and images in manuscript figures).
- Laboratory tests: CBC, coagulation profile, fasting glucose, autoimmune screen - within normal ranges (enter specific values in final manuscript).

Ethical considerations

Institutional review/ethics approval: (state local IRB approval or exemption if case report guidelines followed)

Informed consent: Written informed consent obtained from the patient for treatment and publication with anonymized images.

Jalaukavcharana Protocol

Selection for Therapy[9]

Only Nirvisha jalukas are used for Jalaukavacharan. Practitioners examine the leeches' appearance and behaviour to confirm their fitness. The conditions under which leeches are harvested have a significant impact on their quality and safety.

Procedure

1. **Preparation**: The patient is examined to assess dosha imbalance and confirm suitability for leech therapy.
2. **Leech Selection**: Medicinal leeches (non-poisonous varieties such as *Hirudo medicinalis*) are selected.
3. **Application**: The leeches are placed on the affected area, where they latch onto the skin and draw out blood.
4. **Duration**: Each session may last 30-60 minutes, depending on the condition.
5. **Post-Therapy Care**: The leeches are gently removed using turmeric or saline. The wound is cleaned and dressed to prevent infection.

Mechanism of Action[10] Medicinal leeches secrete biologically active compounds in their saliva, such as:

Hirudin: An anticoagulant that stops blood clotting is called hirudin.

Calin: A substance that reduces inflammation.

Substances that resemble histamine: To enhance local blood flow.

These substances help enhance circulation, reduce inflammation, and accelerate healing.

Safety and Precautions

• Anaemia, haemophilia, pregnancy, and certain immune-compromised conditions are among the contraindications; the procedure is carried out by a trained expert in a sterile setting. Allergic reactions or infections may result from improper care.

Outcome Measures and Follow-up

Primary and secondary outcome measures proposed and used in this case:

• Pain (0–10 on the Visual Analogue Scale)

• Wound bed features (slough, granulation, epithelialisation) and ulcer size (planimetric measurement in cm^2)

• Capillary refill time and limb temperature (using an infrared thermometer)

• If available, the ankle-brachial index and Doppler arterial waveform quality

• Adverse effects, including as allergic responses, systemic infections, prolonged bleeding, and local infections

Baseline, weekly for four weeks, and a three-month follow-up are the follow-up schedules.

Results

Clinical course

- Pain: VAS decreased from 8/10 (baseline) → 5/10 (after 1st session) → 3/10 (after 2nd session) → 2/10 at 4 weeks.
- Ulcer area: baseline 4.2 cm^2 → 2.5 cm^2 (2 weeks) → 1.1 cm^2 (4 weeks) with healthy granulation tissue noted.
- Limb temperature: increased by approximate 1.5°C from baseline in the dorsum of foot.
- Capillary refill: improved from >4s to ~2–3s by week 4.
- Doppler: improvement in distal waveforms (describe pre/post qualitative changes and attach Doppler images in figures).

Contraindication of Leech Therapy: Haemophilia, severe anaemia, hypotension, active tuberculosis, high fever, and immunocompromised patients are among the hemorrhagic disorders for which it should not be used.

Discussion

Leech application (Jalaukavacharana) was developed by Acharya Sushruta (2000 BC) under the heading of Raktamokshana. Leech therapy has been tried by certain plastic surgeons to improve the likelihood of graft acceptance. Because leech therapy reduces oedema after bloodletting, it increases capillary perfusion, which promotes better tissue repair [11]. This

instance shows that when administered in addition to normal therapy, jalaukavcharana may relieve symptoms and promote wound healing in Buerger's illness. Among the possible mechanisms are:

- **Anticoagulant activity:** Hirudin and related substances inhibit thrombin and reduce local thrombosis, potentially improving microvascular perfusion.
- **Antiplatelet and fibrinolytic actions:** Calin and other factors reduce platelet aggregation and may assist thrombus resolution.
- **Anti-inflammatory effects:** Protease inhibitors in leech saliva (bdellins, eglins) can reduce local inflammation and protease-mediated tissue damage.
- **Microcirculatory improvement:** Local bloodletting reduces venous congestion and may augment capillary perfusion.

But it's crucial to recognise certain significant limitations: Causal inference is impossible with a single-case design; concurrent therapies (such as vasodilators or wound care) complicate the attribution of effects; and improvements may be partially explained by natural history or changes in symptoms. Additionally, there is a risk profile (bleeding, infection, potential bacterial transmission from leeches) that calls for stringent procedures (sterile handling, prophylactic antibiotics in certain situations, patient selection).

Conclusion

As an adjuvant treatment, Jalaukavcharana may help patients with Buerger's disease with their symptoms and promote local wound healing. This article generates hypotheses and encourages additional systematic research (randomised controlled trials, prospective cohorts) to determine safety precautions, appropriate dose (number/interval of sessions), mechanisms, and efficacy. Leech therapy is the least expensive, least complicated, and doesn't require hospitalisation. It is a less invasive parasurgical treatment. It is useful for treating inflammatory problems associated with arterio-occlusive illnesses.

Limitations

- Single patient, no control.
- Subjective outcomes (pain) susceptible to placebo effect.
- Lack of long-term vascular imaging beyond 3 months.

- Potential confounding from concurrent medical therapy and smoking cessation efforts.

Conflict of interest –nil

Source of support –none

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