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MANAGEMENT OF BUERGER'S DISEASE WITH JALAUKAVACHARAN (LEECH THERAPY): A CRITICAL REVIEW

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Abstract: *Buerger's disease is characterized by segmental thrombosing, acute and chronic inflammation of small and medium size arteries, mainly in the lower limb. It is a chronic disorder, also known as Thrombo-Angitis Obliterance (TAO). The prevalence of peripheral arterial diseases in India ranges from 45-63%.It is mainly caused by cigarette smoking; other factors are poor hygiene, genetic factors, autonomic over-activity etc. Buerger's disease presents with rest pain, intermittent claudication, discoloration and gangrene formation. Diagnosis can be made with clinical examinations, physical tests and investigations like Doppler ultrasound, Duplex scaning, arteriography etc.Treatment of Buerger's disease is very challenging to physicians and surgeons also due to recurrence. Ayurveda the great science of life has elaborately described leech therapy (Jalaukavcharan) to remove vitiated doshas from affected organ. Leech therapy has its excellence by improving blood circulation through vasodilatation effect also acts as anti-inflammatory, analgesic and improves wound healing process. These all effects are due to certain chemicals presents in the leech saliva like bradykinin, heparin, bdellins etc.*

Key words: *TAO, smoking, leech therapy, heparin etc.*

Introduction: Buerger's disease is characterized by segmental thrombosing, acute and chronic inflammation of small and medium size arteries, mainly tibial and radial artery sometimes veins and nerves involved. Buerger's disease is common in 3rd, 4th, and 5th decade of life [1]. It is a chronic disorder, also known as Thrombo-Angitis-Obliterance (TAO). Details described by Leo Buerger in 1908 and in 1924 reported that tobacco use was probably predisposing factor [2]. It is more common in men between 20-40 years of age. The prevalence of peripheral arterial disease in India ranges from 45-63% [3].

Etiology

1. Cigarette smoking: Smoking cause's direct endothelial damage that leads to hyper-coagulability and thrombosis, matrix metalloproteinase up regulation (e.g., MMP-1 and MMP-9), and by promoting the adhesion and binding of monocytes to the endothelial wall of blood vessels [4].
2. Rare in female smokers due to hormonal influence (oestrogen –vasodilatation effect).
3. Lower socioeconomic condition with poor hygiene.
4. Genetic factors- HLA association (increased HLA-A9 & HLA-B5) [5].
5. Autonomic over activity-Over stimulation of sympathetic system leads to peripheral vasospasm.
6. Autoimmune mechanism-Finding of antibodies and lymphocyte mediated sensitivity to collagen is decreased [1].

Pathological Aspect

a. In Early Stage: Infiltration of polymorph in all layers of vessels leads to mural or occlusive thrombosis.

b. In Advanced Stage: Cellular infiltrates like mononuclear cells, epitheloid cell granuloma with langerhan's giant cells leads to thrombus formation and re-canalisation of thrombus [6].

Clinical features

- Pain due to superficial nodular phlebitis and ischaemic neuritis.
- Intermittent claudication.
- Rest pain, chronic ischemic ulcerations –toe, feet etc [7].

- Tingling and burning sensation in the limb.
- Discoloration (Trophic changes).
- Gangrene.

Diagnosis: Diagnosis can be made by- A) Clinical examinations, B) Physical tests, C) Investigations. **A. Clinical Examinations of Buerger's Disease**

1. Inspection: Flattening of terminal pulp of toes, nails become brittle, flattened and ridged, skin becomes shiny, cracks, ulceration, gangrene with clear line of demarcation) and limb atrophy of muscles.

2. Palpation: Palpation of peripheral pulses, tenderness, pitting edema, ulcer and gangrene etc.

B. Physical tests:

a. Buerger's Postural Test: Normally raising the leg by 90 degree remains pink but in severe arterial occlusion raising the leg by less than 30 degree becomes pallor,

b. Capillary Refilling Test: Normally limb remains pink but in ischemic limb becomes pallor after 20-30 seconds becomes pink.

c. Allen's Test (Palpation of Peripheral Pulses): An abnormal Allen test in a young smoker presenting with leg ulcerations is highly suggestive of TAO [8].

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 (angiography)-There is formation of 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.

Treatment

1. Conservative Treatment: The most effective treatment for Buerger's disease is to stop cessation. It is therefore essential that patients diagnosed with Buerger's disease must stop smoking immediately and completely in order to prevent progression of the disease and avoid amputation [9]. Physicians must educate and counsel their patients repeatedly about the importance of discontinuing the use of all tobacco products

Use of vasodilator drugs along with anticoagulant therapy, in severely painful conditions analgesics (NSAIDS) can be prescribed. Prostaglandin therapy (PGA-1) is used to prevent platelets aggregation. Patients have been advised for Buerger's position and exercise.

2. Surgical treatment: Lumbar sympathectomy (usually L3, 4, 5), arterial reconstruction, Omentoplasty, is performed to improve cutaneous circulation. Amputation–limited to area of gangrene.

Leech Therapy *(Jalaukavacharan*) in Buerger's Disease

Presevation of Leeches: The method of *Jaloukavacharan* is done according to ancient method as described by Acharya Sushruta. Leeches are preserved in fresh water preferably in pond water. Water is changed frequently ie. every third day [10]. Wide spacious pot is kept in cold climates and changed weekly.

Application of Leeches (Procedure):

Jaloukavacharan is a parasurgical measure & the procedure is divided into 3 parts-

1. Purvakarma (Pre-operative Care)

A. Purification of Leeches: Selected leeches are kept in a mixture of mustard paste, turmeric paste & fresh water for one muhoorta (ie.48 minutes) to become active and eager to suck the blood [11]. After purification these leeches are ready for application.

B. Preparation of Patient: Preferably patient should be in lying down position. Before applicant of leech's patient's proper counseling should be done for better outcome of leech therapy.

2. Pradhankarma (Operative Care): Selected site for leech therapy should be cleaned carefully. The number of leeches to be applied varies according to severity of the disease. If a leech does not stuck, then it is applied after making a puncture by sterile needle at that site [12]. Even after this, if it does not stick, another leech has to be applied. The leeche sucks blood by its anterior sucker which is attached to the base by posterior sucker. During sucking of blood leech should be covered with cold and wet cotton swab to protect the leech from excessive heat of blood. Number of application of leeches depends on severity and involved area.

3. **Pashchatkarma (Post-operative Care):** The leeches are removed from the site by sprinkling turmeric powder or rock salt powder or otherwise leech will left the site on its own when completely sucked. Dressing should be done by sprinkling of Triphala kasaya and application of turmeric powder (Curcuma longa), application of honey (madhu) as these are haemostatic, antiseptic and analgesic in nature [13]. After cessation of bleeding, tight bandaging should be done to avoid chances of bleeding. Patient has been instructed to be aware of oozing of blood from the site about 1-8 hrs. Hence must be advised to attend the OPD on next day. Now vomiting is induced to leeches so that sucked blood is removed by sprinkling turmeric powder on its mouth and by slowly & gently squeezing from tail to mouth & then kept in fresh water. If sucked blood is not removed from leech after application, the leech will die due to Indramada /Raktamada disease [14].Again application of leech is strictly avoided and if necessary it can be used after one week interval to avoid Raktamada disease [15].

Contraindication of Leech Therapy: It is contraindicated in treatment of hemorrhagic diseases like hemophilia, severe anemia, hypotension active tuberculosis, high fever, immuno-compromised patients.

Discussion: *Acharya Sushruta* (2000 BC) has elaborated leech application (*Jalaukavacharana*) under the topic of *Raktamokshana*. Some plastic surgeons have tried leech therapy to increase the possibility of grafts acceptance. Leech therapy improves capillary perfusion and hence better tissue healing occurs due to decreased edema following bloodletting by leech therapy [16]. When the leech sucks the blood, contrarily it injects salivary component eg. bdellins, enkephalins, hirudin inhibits both the platelet aggregation and the coagulation cascade thus releasing the venous congestion and induces neo-vascularization [17]. Analgesic and anti-inflammatory effects, increases micro-capillaries circulation and improves wound healing. So leech therapy is highly beneficial in many arterial occlusive diseases like Buerger's disease. Leech therapy is cost effective, minimum instrumentation, least complications, no hospitalization. It is a minimal access and invasive parasurgical procedure. It can be used effectively in management of inflammatory conditions of arterio-occlusive diseases. It may be used for the restoration of normal health through the prophylactic & palliative action. There is no pain in Leech application as compared to surgical incision.

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