



## A REVIEW ARTICLE ON ROLE OF JALAUKAVACHARANA IN OPEN ANGLE GLAUCOMA

\*<sup>1</sup>Dr. Neeta Pirajirao Bhosle and <sup>2</sup>Dr. A. B. Deshmukh

<sup>1</sup>PG Scholar, Shalakya Tantra- Netraroga, Govt. Ayurved College, Nanded.

<sup>2</sup>Guide and HOD, Shalakya Tantra, Govt. Ayurved College, Nanded, Maharashtra.

\*Corresponding Author: Dr. Neeta Pirajirao Bhosle

PG Scholar, Shalakya Tantra- Netraroga, Govt Ayurved College, Nanded.

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### ABSTRACT

*Raktmokshana* is one of the parasurgical, detoxification methods of *Panchakarma*. It is the process of elimination of vitiated *Dosha* that accumulate in the body. *Jalaukavcharana* is type of *Raktmokshana* which is practiced globally in India since ancient times to treat *Netrarogas*, in which vitiated *Pitta* and *Rakta Doshas* get let from the body. *Jalaukavcharana* is an effective blood purification therapy which has property to subside the pain, swelling, redness and burning sensation immediately and in which small quantity of blood removed to neutralize accumulated vitiated *Pitta* and *Rakta dosha* of many blood borne diseases. Thus diseases caused by *Pitta* and *Rakta Doshas* are relieved. Also it is much safer and less complicated Natural process. Open angle glaucoma is an eye disease in which there is an unstable or sustained increase in intraocular pressure resulting damaging of eye structures and impairment of its function. In open angle glaucoma, *Jalaukavacharana* facilitates drainage of aqueous humor through the trabecular meshwork by creating negative pressure in the vein present locally.

**KEYWORDS:** *Raktamokshana*, *Jalaukavcharana*, *Pitta Doshas*, *Rakta Doshas*, Open angle Glaucoma.

### INTRODUCTION

In Ayurveda, bloodletting therapies through leeches are used in management of various disorders, especially which are caused due to vitiation of *Pitta* and *Rakta Doshas*. *Jalaukavcharana* due to its easy applicability, painlessness, lack of serious complications be practiced in eye diseases as *Chikitsa*. *Jalauka* is very much beneficial in vitiated *Raktaja Doshas* in Kings, wealthy persons, childrens, old aged, women and persons of tender constitution, it expels vitiated *Rakta Doshas* completely from selected part of the body. Acharya Sushruta has described *Jalauka* under the heading of *Anushastra* (parasurgical procedure) and has the property to subside the pain, swelling, burning sensation and redness of eyes immediately. Leech application is also known as *hirudo-therapy* and *leech therapy*. Leeches are segmented worms that belong to the phylum *Annelida*.<sup>[1]</sup>

#### Etymology of *Jalauka*

The term *Jalauka* can be split into *Jala* + *oka* i.e. water dwelling animals. The word leech is derived from *laece* which means physician leech are given the name *Jalauka* because of their site of dwelling and the source of their nutrition is *Jala*.<sup>[2]</sup>

A detailed description on *Raktamokshana* is available in *Ayurvedic Text*.

There are two main types of *Raktamokshana*.<sup>[3]</sup>

1. *Shastra Vistravana*- By using metal instruments.

#### Two types

- i. *Pracchana* - bloodletting through multiple incisions.
- ii. *Siravedha* - bloodletting through venepuncture.

2. *Anushastra Vistravana*- Without use of metal instruments.

#### Three types

- i. *Jalaukavacharana*- application of leeches- indicated for vitiated *Pitta Doshas*.
- ii. *Shrungavacharana*- sucking through cow's horn- indicated for vitiated *Vata Doshas*.
- iii. *Alabu*- vacuum extraction by *Alabu/ Bottle Guard*- indicated for vitiated *Kapha Doshas*.

In Ayurvedic surgery text, *Raktamokshana* is considered as the partial or complete treatment in itself.

### AIM AND OBJECTIVES

1. To reveal the role of *Jalaukavacharana* in Open angle glaucoma.
2. To reveal the importance of *Jalaukavacharana* as parasurgical procedure in *Netraroga*.

## MATERIAL AND METHODS

The data was studied and collected from all the literatures described in *Brihatrayi*, *Laghutrayi*, *Vaidyas* and through personal experiences regarding *Raktamokshan* therapy. The use of leeches in medicine dates beyond many years ago. Now a days leech are used in microsurgeries like cosmetic surgeries and many eye diseases.

### Types of *Jalauka*<sup>[4]</sup>

In *Susruta Samhita*, diseases of *Netra* and their treatment is described in *Uttartantra* in detail. 12 types of leeches are found and classify them into two main categories i.e.

- Non poisonous leech (*Nirvisha Jalauka*)
- Poisonous leech (*Savisha Jalauka*)

#### I) *Nirvisha Jalauka*

- 1) *Kapila* (colour like real gar)
- 2) *Pingala* (Reddish)
- 3) *Shankamukhi* (Blackish)
- 4) *Mushika* (Common blind moles)
- 5) *Pundarikamukhi* (greenish black)
- 6) *Savarika* (like lotus leaves)

#### Characters of *Nirvisha Jalauka*

Such types of *Jalaukas* are characterized by following points:-

- i) Strong and large bodies
- ii) Ready suckers
- iii) Greedy

#### II) *Savisha Jalauka*

- 1) *Krishna* (black in colour)
- 2) *Karbura* (Ventrul surface is convex)
- 3) *Algarda* (hairy & black mouth)
- 4) *Indrayudha* (different colour like rainbow)
- 5) *Samudrika* (Blackish yellow)
- 6) *Gochandana* (bifurcating lines).

#### Characters of *Savisha Jalauka*

Such type of *Jalauka* is having the following Characters according to the *Ayurvedic* texts.

- i) Thick
- ii) Slow locomotion
- iii) Fatigues
- iv) Middle part elongated
- v) Delay in suckling
- vi) Not commandable type.
- vii) Sucks little quantity of blood.

#### Features of *Savisha Jalauka* bite

If *Savisha Jalauka* is applied then a person suffers from following clinical symptoms

- a) Burning b) Itching c) swelling d) Drowsiness e) fever
- f) Delirium g) unconsciousness

#### Collection of leeches<sup>[5]</sup>

According to *Sushruta Samhita*, leeches should be collected from ponds or lakes with the help of piece of wet leather. According to *Charaka Samhita*, best time for

collection of leeches is autumn season. In autumn, water becomes hot during day time due to exposure to sun, cools in the night and is well detoxified. A popular method is collecting leeches in certain regions is by using a large tin can. The top of the can is crushed leaving the mouth opening of an inch or two wide.

#### Time of collection

Acharya Dalhana has told that the best time for collection leeches is *Sharad Ritu* (Autumn).

#### Storage of leeches<sup>[6]</sup>

According to *Sushruta Samhita* collected leeches should be stored in a now big wide pot containing clean water and mud from tanks or ponds. Powder of moss, dried meat should be given for feeding straw and aquatic plants should be provided for making their bed. After 3 days water should be changed & pot should be changed weekly.

#### Purification of leeches for application<sup>[7]</sup>

According to *Sushruta Samhita*, a paste prepared with mustard, turmeric and water should be applied on the body of the leech. They should then be kept in a vessel of water for about 48 minutes (*Muhurta*) till they get rid of their exhaustion.

#### Hirudin

It was recognized in the saliva of leeches in 1884. It was used in early transfusion experiments 30 yrs before Heparin was used. Since 1986, When Hirudin was genetically engineered; interest has been recharged in drug as a systemic anticoagulant free of some of heparins side effects. It is also termed as anti-coagulin. It also works as diuretic and antibiotics.

#### Chemical constituents of saliva

The leech produces a number of important substances which contribute to the special property of the bite, including an anticoagulant, a local vasodilator & local Anesthetic like Hirudin, Hyaluronidase, Hementinetc.

#### Hyaluronidase

An enzyme called hyaluronidase, which break down hyaluronic acid, the bonding material of connective tissue, thus fostering the flow of blood and Fluids from affected area. It is a "Spreading factors" Antithrombin, Antitripsin and antichymotripsin activities were found in the salivary gland secretion and intestinal chyme of forming antithrombine activity work maintained in starved leech.

#### *Netra-roga Samprapti*

*Prakrupita Tridoshas* vitiated by *Hetusevana* goes through *Urdhwgami Sira* of *Netra* and produces *Darun Netraroga*.<sup>[8]</sup> *Netra* is the site of *Alochaka pitta*.<sup>[9]</sup> The properties of *Pitta* and *Rakta* are same as they have *Ashrayashrayi Bhaav*.<sup>[10]</sup> In such condition, *Jalaukavacharana* is useful in *Netraroga* produced by

*Raktadushti* and *Pittadushti*. *Raktadhatu* is very important for its *Jeevniya Karma*.<sup>[11]</sup>

#### Indications

Following eye diseases are treated with *Raktamokshana*<sup>[12]</sup>

1. *Abhishyanda* of all types (Conjunctivitis),
2. *Adhimantha* of all types (Glaucoma),
3. *Siraharsha* (inflammation),
4. *Sirotpat* (Hyperemia),
5. *Puyalasa* (Acute Dacryocystitis),
6. *Vataparyaya* (Ocular pain),
7. *Anyatovata* (Ocular Pain),
8. *Sashof Akshipaka* (Purulent conjunctivitis),
9. *Ashof Akshipaka* (conjunctivitis).
10. Complicated condition of *Arma* (Pterygium)
11. *Savvana Shukla* (corneal ulcer)
12. *Pittaja Timira* (painless loss of vision)
13. *Kaphaja Timira* (painless loss of vision)

#### Contraindications of leech application<sup>[13]</sup>

1. Very young, old, emaciated, exhausted
2. Suffering from high fever, convulsions or unconscious patients
3. General swelling of body
4. Wasting due to unhealthy diet
5. Anemia
6. Piles
7. Pregnant women

#### Best time for *Jalaukavacharana*<sup>[14]</sup>

- Cloudless day in rainy season (*Varsha Ritu*)
- Cool day in summer (*Grishma Ritu*)
- Noon in winter (*Sharad Ritu*)

#### Site of *Jalaukavacharana*<sup>[15]</sup>

- *Lalat* (Frontal area)
- *Apanga Sandhi* (Outer canthus)
- *Upnasya* (Inner canthus)

**Procedure:** The mode of application of *Jaloukavacharanam* consists of three parts.<sup>[16]</sup>

1. *Poorva Karma*
2. *Pradhana Karma*
3. *Paschat Karma*

#### *Poorva Karma*

Preparation of leeches -Before applying it to the patients, leeches should be purified by smearing solution of paste of *Sarshapa* and *Rajani*.

#### *Pradhana karma*

Site of *Jalaukavacharana* is palpebral conjunctiva. Site should be cleaned with water. The lid is everted and the active *Jaluka* is made to suck in the palpebral part of conjunctiva. Apply the leech to the site of application. If the leech does not bite that area then rub with mud, ghee or make a wound with a sharp instrument. Horse shoe shape of neck indicates leech is sucking impure blood. Then cover it with a moist cloth. *Jalouka* first suck only

the vitiated blood from a mixture of pure and impure blood. If pain and itching develops at the site of bite, it is to be understood that it is sucking pure blood. Then it should be removed. If it does not leave off easily because of odour of blood, then sprinkle powder of *Saindhava* over its mouth.

#### *Paschat Karma*

After it falls off; its body should be sprinkled with *Haridra*, held at its tail end by thumb and fingers of the left hand and its body kneaded slowly in the downward direction with thumb and fingers of the right hand and made it vomit all the blood it has consumed.

**Complications-** When *Jalouka* do not vomit the blood fully, when they are applied frequently and when they are inactive even after getting into water, should be considered as intoxicated and should be rejected.

#### Glaucoma<sup>[17]</sup>

An eye disease that is characterized by an unstable or a sustained increase in intraocular pressure which the eye cannot withstand damage to its structure and impairment of its function. Glaucoma is a group of eye diseases result in damage to optic nerve and vision loss. It has multifactorial etiology and characterized by progressive optic neuropathy resulting in a characteristic appearance of optic disc and specific pattern of irreversible visual field defect that are associated frequently but not with invariably with raised intraocular pressure. There are several types of glaucoma. The two main types are open angle and angle closure. These are marked by an increase of intraocular pressure inside the eye.

#### Open Angle Glaucoma

It is the most common form of glaucoma. It is caused by slow clogging canals resulting in increased eye pressure. It had wide open angle between the iris and cornea.

#### Pathophysiology

The underlying cause of open angle glaucoma remains unclear. However the major risk factor for most of glaucoma and focus of treatment is increased intraocular pressure. Intraocular is function of production of liquid aqueous humor by ciliary processes of eye and its drainage through trabecular meshwork via scleral venous sinus (schlemm's canal) into scleral plexuses and general body circulation. Whenever there is block in drainage process due to degeneration and obstruction of trabecular meshwork, intraocular pressure increases causing damage to optic nerve.

#### DISCUSSION

*Jalaukavacharana* removes not only blood from the body but also injects biologically active substances which help to manage various disorders. Leech therapy facilitates drainage of aqueous humor through the trabecular meshwork. As the leech suck peripheral blood it creates negative pressure in the vein present locally and facilitates drainage. Number of setting may be

required depending upon the improvement of patient. Hirudin also helps in reducing the blood thickness, thereby promoting optimum blood flow and preventing the risks associated with sluggish blood flow. Biologically active substance in leech saliva helps the cells to absorb necessary nutrition & eliminate toxins. The patients who suffer from pain and inflammation will feel relief from the anti-inflammatory and anaesthetic effects of the leech's saliva.<sup>[18]</sup>

According to Ayurveda, Diseases are occurred by vitiation of *Dosha*. The vitiated *Dosha* can get accumulated in *Netra Sira* which causes biochanges and may lead to the eye disorders. Many diseases could be treated with leech application.

#### Probable mode of action of *Jalaukavacharana*

The probable mode of action of *Jalauka* is purification of body by removing deeply seated toxins and pacifying vitiated *Dosha*. A healthy cell gets sick; it is deprived of needed oxygen and nutrition and is unable to remove toxins accumulated during metabolism. Biologically active substances in leech saliva help the cells to absorb necessary nutrition and eliminate toxins. This modality falls under purificatory therapies, which cleanse the body and helps in maintenance of health.

#### CONCLUSION

*Jalaukavacharana* is described under *Raktamokshana* of *Panchakarma* of *Ayurveda*. It is one of the very effective treatment modality for treating various *Netra-roga* as well as in many systemic diseases. It is also helpful as adjuvant therapy in Glaucoma. When leech is applied to biologically active areas of the human body, the bite itself gives a positive effect. According to modern science, leech's saliva contains Hirudin, Hyluronidase enzyme which acts as anticoagulant, local anaesthetic, anti-inflammatory vasodilator, antithrombotic, hypotensive and analgesic effect. Hence, more efforts should be undertaken to optimize this utilization. More clinical trials are required to assess leech efficacy and safety in the treatment of Glaucoma.

It is easy to learn and apply the para surgical procedure like *Jalaukavacharana* in the management of different surgical conditions where surgery is not possible to treat the condition or there is great chance of recurrence of disease as in Glaucoma. This process provides lot of options for the surgeon as it is easy to perform, less chance of recurrence, controlled bleeding, no need of suture, less post-operative haemorrhage and minimal pain. Therefore it is helpful as adjuvant therapy in Open Angle Glaucoma.

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