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Management Of Varicose Veins : An *Ayurvedic* Review

Akshay Suden

Associate professor, Department of *Shalya Tantra* , Kalawati *Ayurvedic* Medical College, Hospital & Research Centre, Gorah, Kasganj, UP-207123

ABSTRACT: Varicose veins is a chronic disease, commonly afflicting the lower limbs, particularly the persons in higher age group, engaged in arduous work, or in prolonged standing jobs, etc. The disease management options available with the modern system are manifold, but none provides an easy and assured permanent cure. Further, no medicinal treatments are available, only immunity boosting drugs are prescribed to build up immune system of the blood, etc. As against this, the *Ayurvedic* system has well documented medications available on this front. The *Siraja Granthi*, *Siragata Vata* & *Vata-Rakta rogas* of *Ayurveda* resemble very closely to Varicose Veins. These *rogas* are manageable with *Raktmokshana* through *Siravedha* or Leech therapy along with internal and external medications. An assessment of the management strategies being made currently against this disease has been made to cull out the weaknesses and shortcomings in the existing options, with a view to suggest suitable ways & means to overcome them and improve upon their performance. These are briefly **outlined below** :

The *Ayurvedic Siraja Granthi* & *Siragata Vata rogas* are synonymous with the modern system disease of varicose veins. *Raktamokshana* is the **primary** *Ayurvedic* medication against Varicose Veins. *Raktamokshana* through *Jalauka Avacharana* is the preferred option on account of its simplicity, ease, etc., but that it **alone is not enough**. Prescription of **secondary medications** i.e. internal and external medications is essential for securing an **enduring cure**. Internal & external medications are often needed to be continued longer than found in the articles reviewed, of course depending upon the signs and symptoms of the patient. External medications should include *Yoga Asanas*, especially the *Viparita Karani Asana* on a regular basis. Recommendation of **Diet Regime, Dos and do not Dos** should be included in the prescriptions. Modern system based treatments of varicose veins have many side effects apart from higher chances of recurrence, etc. The studies reported in the review are mainly case studies, even the other few ones required prolonging of the treatment schedule, etc. **Lastly**, conduct of just case studies would not lead to **anywhere**. **Institutional**, statistically well planned project base studies are required to be conducted to come out with adoptable findings.

Key words :- *Raktmokshana* , *Siravedha* , Varicose veins, *Yoga Asanas*, Diet Regime

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Corresponding Author : Akshay Suden,

Associate professor, Department of *Shalya Tantra* ,
Kalawati *Ayurvedic* Medical College, Hospital &
Research Centre, Gorah, Kasganj, UP-207123,
Email, Id-akshaysuden123@gmail.com

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INTRODUCTION:

Varicose veins disease, usually occurs in the middle aged and elderly people. The lower limbs are the most common sites of varicosity disorder. Abnormal, dilated, elongated and tortuous manifestations in the saphenous veins and their tributaries are called varicose veins. The varicose veins become swollen and bulging and are easily identified with naked eye. Varicose veins are, generally observed on the thigh and back of the calf muscles and to a lesser extent exteriorly on the inner side of legs. The common problematic signs & symptoms are heaviness in the legs, muscle cramps, itching around the swollen veins. Pain is felt in the whole or lower part of the leg. Other symptoms are skin pigmentation, eczema, etc. Incompetency of the valves and the weakness in the walls of the veins are considered as the **primary causes**. On

becoming chronic, veins develop venous insufficiency. The **secondary causes** obstruct the venous outflow. This abnormality occurs due to several causes such as : pregnancy, fibroid, ovarian cyst, pelvic cancer, ascites, and deep vein thrombosis, hereditary factors, prolonged standing, etc. Modern treatment comprise limb bandaging, surgical treatment, Sclerotherapy etc. but no medicinal treatment is available. The modern system tries to develop the immune mechanism in the blood system by resorting to the antitoxic substances in the blood stream, but with no assurance of permanent cure. *Ayurveda* advocates, “**Let the noxious blood be let out**”. It will either cure the disease or else it will make a clear pathway towards further treatment modalities. More

on *Ayurvedic* aspect is going to be discussed in what follows.

AIMS & OBJECTIVES

The aims and objectives of this presentation are spelt out below :

1. Ascertain information available on the recent and traditional options for managing Varicose Veins and assess the level or degree of their success.
2. Find out and suggest ways and means to improve upon the performance of these management procedures.

MATERIALS AND METHODS

The material consists of **fourteen** research and review articles related to the treatment of Varicose Veins, published in the reputed journals, and one master's degree **dissertation** on the topic, submitted to a university. Method consists in finding out the extent of their success and weaknesses and shortcomings (of reviewed studies) with a view to suggest suitable ways and means to overcome them and improve upon the existing performance level of the management procedures.

First¹ article presented a case study of a 74-year old male patient suffering from varicose veins.

The following Signs & Symptoms were present :

1. **Duration :** The disease was of 10 years standing
2. **Pain :** Dull aching pain in calf region of left leg, aggravating on long standing, especially during evening hours, relief on elevation of legs
3. **Swellings :** Present since 6 months
4. **Itching :** Present from calf region to dorsum of foot in both the legs
5. **Prominent dilated and tortuous veins :** Present at the medial aspect of calf region of left leg since 10 years
6. **Muscle cramps :** Present
7. **Blackish discolouration of skin :** Present
8. **History :** Varicose veins stripping done in both the limbs 30 years ago
9. **Homan's sign & Mose's sign :** Negative

Treatment : The following treatment schedule was prescribed :

1. **Jalauka Avacharana :** Once in seven days, for one month
2. **Mahamanjishtadi Kashaya :** 20 ml

with 60 ml lukewarm water twice daily, before food, for 4 weeks

- 3. Follow up :** One month after the treatment period

Results :

1. The clinical features of varicose veins were improved at the end of 4th week
2. Pain, itching, oedma and burning sensation reduced considerably
3. Dilated and tortuous veins in the calf region reduced in size and became prominent only during exertion
4. Hyper-pigmentation with eczema present below knee joint extending to the dorsum of foot, reduced considerably and became a patchy or scattered blackish discolouration
5. No recurrence observed, highlighting the long term efficacy of the remedy for varicose veins
6. *Jalauka Avacharana* showed early results in reducing the signs and symptoms of *Siraja granthi*, especially in *Shoola, Daha, Shotha* and *Kandu*

Comments : Success of the *Jalauka Avacharana* technology along with the internal medication of *Mahamanjishtadi Kashaya*, especially

on an old person having long standing varicose veins, is indicative of its merits. It is a very small scale study, the results should not be accepted just on face value. But the study definitely deserves larger scale replication.

Second² is a review article, briefly explaining the etio-pathogenicities of varicose veins, the related causes, signs, symptoms, the currently available surgical and non-surgical options. The presentation emphasized on a number of curative options, globally available from the plant kingdom, including options available from *Ayurveda* as well as from *Yoga* system. These are very briefly sketched in below :

Etio-pathogeny :

Venous Insufficiency disease causes enlargement and gnarling of the Veins. It mostly happens in legs. There is a reflux (reverse, backward) flow of blood through the valves of legs. This disease causes a great instability in the circulation of blood.

Responsible factors : Though these factors are not clearly understood as yet :

1. Age
2. Hereditary
3. Pregnancy
4. Obesity

5. Occupations involving prolonged hours of standing
6. Diet
7. Type of physical activity
8. Excessive use of hormones, etc.

The signs & symptoms in the initial stages :

1. Severe pain
2. Swelling
3. Itching
4. Heavy legs
5. Lipodermatosclerosis (skin thickening)

Complications in the later stages :

1. Bleeding veins
2. Eczema
3. Skin pigmentation or discoloration
4. Venous ulcers
5. Complete veins' incompetence

Diagnosis : It is done with the **Duplex Scan** method using the pulsed **Doppler ultrasound**.

Earlier Treatments : The earlier treatments for varicose veins included :

1. Compression therapies
2. Use of special type of compression stockings and socks and surgeries
3. Vein stripping
4. Cryosurgery

5. Ambulatory phlebectomy

Presently more effective Non-Surgical Techniques for better and sooner healing Varicose Veins are available.

Modern Treatments :

1. **Sclerotherapy :** For treating Spider veins or angioectasis by injecting sclerosing agents such as sodium salicylate, polidocanol, chroamted glycine accompanied with compression stockings, subject to some side effects.
2. **Ultrasound guided foam sclerotherapy :** Sclerosing agent is in the form of foam providing larger surface area on the walls of the veins. It damages the endothelial layer of the veins to block and create a scar formation in the dilated veins. The bubble embolism and thrombophlebitis are the side effects.
3. Endothermal Ablation
4. Radio frequency ablation of the Varicose Veins
5. Endovenous Ablation

Surgical Treatments : :

1. Vein Stripping
2. Ambulatory Phlebectomy

BRIEF INTRODUCTION OF THE OTHER AVAILABLE OPTIONS

Therapy based on *Yoga* & Physical Exercises :

The following *Yogasans*, exercises and massages increase the muscle strength, stimulate the flow of blood and enhance the circulation and thus promote healthy veins

A. *Yoga* & other Physical Exercises

1. *Sarvangasana*
2. *Halasana*
3. *Pawanmuktasana*
4. Walking
5. Cycling
6. Swimming, etc.
7. Elevation of the legs using pillows or any other props

C. **Massage therapy : Oil Massage** by applying tension onto the muscles in the upward direction of the legs :

1. Citrus oils
2. Olive oil
3. Mustard oil
4. Castor oil etc.

D. **Compression therapy**

- Use of compression stockings constricts the dilated veins by creating pressure on surface of the calves. This decreases the passage of the veins

thereby increasing blood movement towards the heart

Natural Treatments

Ayurvedic Management: Varicose Veins are caused by the vitiated *rakta-pitta*. *Rakta-pitta dosha* can be pacified by adopting either of the two methods :

1. Purification of blood using blood purifiers and blood thinners
2. Pacification of vitiated *pitta dosha* (inflammation) through purgatives

Herbal Remedies :

1. Horse Chestnut (*Aesculus hippocastanum*) Seeds Extract
2. Gotu kola (*Centella asiatica*)
3. Apple Cider Vinegar
4. Butcher's Broom (*Ruscus aculeatus*)
5. Garlic (*Allium sativum*)
6. *Emblica officianalis*: Amla in hindi
7. Tomato
8. Grape Seed Extract
9. Citrus Fruits
10. *Rubia cardifolia* : Manjistha in Hindi

Comments : The article made a just, surfacial or a superficial coverage of varicose veins and its treatments.

Practically, nothing has been presented from *Ayurvedic* angle which is so rich on this aspect. Some indicative description of course has been made about the use of Leech Therapy for treating varicosity. So important, *Ayurvedic* internal and external medications have been escaped, without which the presentation looks void and incomplete. The *Halasna* and *Sarvangasna* are difficult *Yogasanas*, and are not without risks, at least for varicose veins' patients. Information about common herbs, modern system of medicine, etc. is good but just only for general awareness purpose.

Third³ is a literary review of *Siravedha* based on the **Sushruta Samhita**. The article described two different types of procedures mentioned in the ancient literature on *Raktamokshana*. *Siravedha* should be used to provide relief in pain, stiffness in *Gridhrasi* (sciatica) and *Vatrakta* (gout). It is used in curing disorders like varicose veins, skin disorders etc. *Raktmokshana* is one of the five *Panchakarma* procedures or the 5 basic techniques of detoxification. It is the only *Shodhana* procedure where the vitiated *doshas* are taken out from the *Shakhas* by creating an artificial route, in which carefully controlled removal of considerable amount of blood can take

place. *Raktamokshana* can be broadly classified into two types :

1. **Ashastra** (performed with the measures other than sharp instruments)

- *Jalauka*
- *Alabu*
- *Srungi*

2. **Sashastra** (performed with a sharp instrument)

- *Prachana*
- *Siravedha*

Siravedha is an important and useful method of *Sastrakrut Raktamokshana*.

Benefits :

- The procedure is cost-effective and safe.
- Hospitalisation is not needed, as it can be performed in OPD.
- *Doshas* are eliminated from *Shakhas* and there is no need to bring the *Doshas* to *Kostha*.
- *Siravedha* acts in *Avrodhjanya samprapti* (obstructive pathology) mode.
- It relieves the obstruction, causes *Vatanuloman*, relieves pain and stiffness.

Varicose Veins :

Chronic non-healing wounds hamper the blood circulation. *Siravedha* removes this causative factor to regularize the blood flow with consequent relief.

Skin Disorders :

Blood-letting detoxifies the blood. It is classified as a *Shodhana* procedure. This procedure is, therefore employed in treating skin diseases requiring purification of blood.

Hypertension and Polycythemia Vera:

The effect of *Siravedha* is on the whole body. So, it can also be employed against systemic diseases like hypertension and polycythemia vera. Blood-letting leads to reduction in blood volume and thus relieves the condition.

Comments : *Siravedha* is undoubtedly a simple, easy and a proven medical procedure requiring no hospitalization etc. It should be used more often to provide relief in many chronic disorders like varicose veins etc. Apart from other things, the review presentation lacks information on pre-medication, post-medication & during medication e.g. internal, external

medications, etc. essential for adoption of the presented procedure.

Fourth⁴ article presented a research study comparing the performance of two methods of management of *Siraja Granthi* namely, *Siravyadhana* and *Basti*. It was conducted on 20 patients for 30 days. Information on treatment doses and scheduling has not been reported. The study reported significant relief in *Sula*, *Gaurava*, and moderate relief in *Shotha* and *Sira Utseda*, but the disease cure rate was not that satisfactory. The study, perhaps **needed more time** i.e. up to two more months or supplemental drugs or therapies or their combination to provide conclusive results.

Fifth⁵ article presented a case study conducted on a 39 year old male patient with the following complaints :

- Dull aching pain
- Dilated, engorged veins over right lower limb for about 2 years
- Mild edema around the right

ankle

- Discoloration
- Itching for the last 4 months

Diagnosis : *Siraja Granthi* was diagnosed

In debilitated persons, aggravated *Vayu* pulls the ramifications (separation of branches) of **blood vessels causing** :

- *Sampeedana*
- *Sankocha*
- *Vishoshanam*
- Produce *Granthi* formation in *Sira*

This condition is known as *Sirajagranthi*.

Vata on getting increased invades *Siras*, **causing** :

- constriction
- distortion
- dryness in the *Siras* give rise to *Siraja Granthi*
- this is non-pulsating and painless

Varicose veins can be correlated with *Sirajagranthi* based on etiopathology and treatment.

Varicose veins of lower limbs are :

- dilated
- elongated
- tortuous veins

These can be caused due to :

- hereditary factors
- prolonged standing
- advancing age
- heavy weight lifting
- multiple pregnancies
- obesity etc.

Complication such as :

- superficial thrombophlebitis
- eczema
- pigmentation
- lipodermatosclerosis
- hemorrhage
- ulceration
- increased risk of deep vein thrombosis

Ayurvedic management which fulfills the above need, has multiple time tested modalities of **treatment such as**:

- external application of *Sahacharadi Taila*
- *Basti*
- Para-surgical procedure of *Raktamokshana* i.e. *Siravyadha* for managing the *Siraja Granthi*

Rakthamokshana is the treatment of choice prescribed by the classics of *Ayurveda* for *Siragata Vata*.

Siravyadha :

- is considered as *Ardha Chikitsa* of *Shalya Tantra*
- is said to provide immediate results than *Snehadi Karmas*
- is a drugless therapy
- is a simple, specialized and efficacious technique, yet not popular

Treatment Schedule for the Patient under study :

1. ***Sahacharadi Kshaya*** : 15 ml BID oral for 28 days
2. ***Raktamokshana*** by ***Siravyadha*** : 4 sittings at 7-day intervals

Results :

Raktamokshana (Siravyadha) line of treatment was found to be beneficial in relieving :

- Pain
- Swelling
- Itching
- Discoloration around the affected regions of varicose veins
- No effect on tortuous dilated veins was found, may be due to inability of *Raktamokshana* in correcting structural damage

DISCUSSION***Raktamokshana* :**

1. is indicated as first line of treatment in *Shakhagata Raktadushti* because it brings *Dosha* in equilibrium and causes *Shodhana* effect
2. is helpful in treating the complications of the varicose veins
3. but varicosities cannot be treated because there is no change in length and width of the varicose veins.

Sahacharadi Kashaya is useful in *Vataroga Chikitsa* because its ingredients :

1. *Sahachara*
2. *Devadaru*
3. *Nagara*
4. Possess the following properties :
 - *Vatakaphahara*
 - *Raktashodhana*
 - *Shothahara*
 - *Kanduhara*
 - *Vedanaprashamana*
 - And help in reducing most of the symptoms associated with *Sirajagranthi*

If the above conditions are treated earlier, then various steps of complication can be

avoided, otherwise severe anoxia in the lower part of the leg and surrounding tissue can lead to chronic venous ulceration.

Comments : It is a nicely presented study, including the needed classical review. Presentation of quantified results of the study would have been still better appreciated by the medical fraternity.

Sixth⁶ is a case study of Varicose eczema in a 38 years old male patient with **complaints of :**

- Pain
- Mild itching
- Burning sensation
- Secretions from the medial side of left lower limb near ankle joint, since 2 months
- Dilated and tortuous veins in the anterior aspect of both lower limbs
- Discoloration
- **Chronicity :** 10 years.

The Ayurvedic translation of these symptoms are :

- Pricking pain (due to exacerbated *Vata* and *Pitta*)
- Dilated tortuous veins (*Sira*, the *upadhatu* of *Rakta*) in both the legs below knee joints

- Local skin changes (due to vitiated *Vata*, *Pitta*, *Rakta* and *Mamsa*)

Treatment Schedule (45 days) :

1. *Virechana* (Purgation)
2. *Triphala Kwatha Parisheka*
3. Dressing with *Jatyadi taila* over local site
4. *Siravyadha* to remove vitiated and stagnated blood
5. *Chitrakadi vati* 450 mg 2 TID before food for two days for *Deepana* and
6. Patient attained *Samyak Pachana Lakshana* after two days
7. Prescribed *Snehapana* with *Mahatiktaka Ghrita* for 5 consecutive days (till *Samyak Snigdha Lakshana*) with initial dosage of 30 ml increasing to 60, 100, 140, and 240 ml on second, third, fourth and fifth days respectively followed by *Sarwanga Abhyanga* with *Balaguduchyadi Taila*
8. *Sarwanga Swedana* (Sudation therapy) for next 3 days
9. On 3rd day, prescribed 50 gm of *Trivrut Lehyam* for *Virechana* along with *Drakshadi kashayam* as *Anupaana*
10. Patient had 16 *Vega* (purgation) with *Kaphanta* (Ending with phelgam) and attained *Madhyama Shudhi*

11. Patient was observed for complications throughout the day.
12. Patient was advised to follow *Samsarjana Karma* (Therapeutic dietary regimen) for 5 days,
13. *Raktamokshana* in the form of *Siravyadha* was performed to remove *dushita rakta*

Relief from the treatment schedule

:

- **Pain** : No pain
- **Tenderness** : Absent
- **Secretions** : Negative
- **Burning Sensation** : Negative
- **Discolouration** : Reduced but Present
- **Eczematous changes** : Negative
- **Varicosity** : Present

Comments : It is a properly planned and nicely presented case study, conducted purely on *Ayurvedic* approach. The only **drawback** is that, it does not meet the statistical requirements of replication and randomization, because of its least size, which hamper its generalization for wider adoption. Regarding, **Varicosity**, there is nothing very strange, **Sushruta** has very clearly mentioned that :

Raktamokshana is an *Ardha Chikitsa*, indicating that appropriate subsequent medications are absolutely necessary for rooting out the generic cause for achieving enduring cure.

Seventh⁷ is a clinical study based on 12 patients suffering from varicose veins. The reported findings are presented below :

Symptoms of Varicose Veins closely resemble with :

1. *Siragata Vata*
2. *Vatarakta*
3. *Sira Granthi*

Cause of Varicose Veins : The disease is due to the vitiation of :

- The three *Doshas*
- *Rakta*
- *Mamsa*
- *Meda Dhatu*

Management Strategy :

- Alleviation of *Pitta Dosha & Rakta Dhatu*
- Medication not antagonistic to *Kapha-Vata Dosha, Mamsa & Meda Dhatu*

Treatment Schedule :

A clinical study evaluated the efficacy of *Virechana* followed by *Jalauka Avacharana* and *Mahamanjithadi Kwatha* and *Kaishore Guggulu* alongside for 30 Days as per treatment schedule presented in Table-1.

| Procedure | Days |
|---|----------------------|
| <i>Deepana Pachana</i> | 7 days |
| <i>Snehapana</i> | 7 days |
| <i>Abhyanha Swedana</i> | 3 + 1 days |
| <i>Virechana</i> | 1 day |
| <i>Samsarjana Krama</i> | 5 days |
| <i>Raktamokshana (Jalouka Avacharana)</i> | 14 days (2 sittings) |
| <i>Shamana</i> | 30 days |

The varicosity was measured as VCSS (venous clinical severity score) defined on the basis of the area of defective veins and not their number, size & tortuosity. The findings are presented in Table-2 :

| Parametre | Right Leg | Left Leg |
|----------------------------|------------------|-----------------|
| Pain | 76.08 | 76.31 |
| Varicose Veins | 15.00 | 6.66 |
| Venous Edema | 70.90 | 64.44 |
| Skin Pigmentation | 67.27 | 70.32 |
| Induration | 33.33 | 100.00 |
| Compression Therapy | 59.09 | 50.00 |
| VCSS % | 53.75 | |

Conclusions :

1. *Raktamokshana (Jalouka Avacharana)* along with *Deepana Pachana, Virechana* and internal medication was found to be effective in the management of Varicose Veins.
2. *Snehana, Swedana, Virechana* and *Raktamokshana* relieved the pain by pacifying the vitiated *Doshas*.
3. *Shodhana* therapy followed by *Raktamokshana* and internal medication, relieved the congestion and venous tortuosity.
4. Elimination of *Pitta* and *Kapha Dosha* through *Virechana Karma* followed by purification of *Rakta Dhatu* through *Raktamokshana* ultimately helped in the pacification of *Shotha*.
5. Skin discolouration (pigmentation) was relieved to a great extent by *Virechana* and *Raktamokshana*.
6. *Kustha, Shodhana* followed by internal medications possessing *Rakta Shodhaka, Kusthaghna* and *Twachya* properties, relieved induration.

Comments : No description of the adopted **compression therapy** or its components etc. has been presented anywhere in the article but results are provided. At one of

the location of the presentation, it appears that the study was conducted on two groups, but no such details are available. This research study appears to be not well presented and also not very well refereed/reviewed.

Eighth⁸ is a review presentation, suggesting the usefulness of Leech therapy for removing the congested blood from the varicose veins. The *Siragata vata* when aggravated, causes *Sira* to develop the following symptoms :

1. *Sankocha*
2. *Sankshipya*
3. *Vritta*
4. *Vaikritatta*

These features resemble with those of Varicose Veins.

The *Dushta vrana lakshanas* are :

1. *Sanvratta*
2. *Vivratta*
3. *Kathina*
4. *Atimrudu*
5. *Utsana*, etc.

These symptoms resemble with those of Venous Ulcer.

The *Jalauka Avacharna Karma* (Leech therapy) should be used to remove any

congested blood from the varicose veins. This will allow normal circulation to return

to the tissues, thus preventing the complications.

Leech therapy is indicated in many diseases : These diseases are presented in Table-3.

| | | | |
|---|--|--|---|
| <ul style="list-style-type: none"> •Eczema •Psoriasis •Cellulites •Sciatica | <ul style="list-style-type: none"> •Osteoarthritis •Rheumatoid arthritis •Inflammatory Reactions •Blood purification | <ul style="list-style-type: none"> •Varicose Veins •Rheumatic Diseases •Diabetic Wounds •Boils and Abscesses | <ul style="list-style-type: none"> •Hypertension •Thrombosis (blood clot) •Alopecia •Herpes zoster. |
|---|--|--|---|

Comments : It is a good presentation on Leech Therapy procedure, and would be helpful for beginners to use the therapy appropriately.

Ninth⁹ is a case study of a 36 years old woman with complaints of varicose veins.

Complaints of the Patient :

- **Pain :** Present in the lower limbs from calf to the dorsum of foot of both legs
- **Pain Relief :** On elevation of legs
- **Prominent, swelling and dilated, tortuous veins :** Present at the antero-medial aspect of the lower 2/3rd part of the leg as well as postero-lateral aspect of the calf

region of left leg, since 4 years

- **Bluish discolouration :** Present
- **Ulceration :** Absent
- **Mose’s Sign :** Slightly positive

Causes of Varicose Veins :

1. The **primary** causes of varicose veins are the incompetency of the valves and weakness in the walls of veins which cause venous insufficiency.
2. **Secondary** causes are due to venous obstruction caused by pregnancy, tumours in the pelvis, fibroid, ovarian cyst and deep vein thrombosis, etc.

In *Ayurveda*, the signs and symptoms of this disease are found in *Siraja granthi* (obstructive circulation, varicose veins),

which is due to *Vata prakopaka nidanas* (the factors which increase *vata*) **such as :**

- Physical exertion
- Straining
- Debilitated conditions

The vitiated *vata* enters the *Siras* (veins) causing:

- *Sampeedana* (squeezing)
- *Sankocha* (constriction)
- *Vishoshana* (act of drying up)
- These three *Vikritis* produce round and protruded *Granthi* in the *Siras* (Veins), manifesting *Siraja granthi* (varicose vein)

Ayurvedic solution is through *Raktamokshana* using *Jalauka Avacharana*.

Treatment Schedule :

1. *Kaishor guggulu* : 1gm
2. *Arshakuthar rasa* : 500 mg 2-2 tablets twice a day
3. *Sahpan* of *Mahamanjisthadi kwatha* : 20 ml BID empty stomach, morning & evening with equal quantity of lukewarm water
4. *Jalauka Avacharana* : 4 sittings, once in each week, for one month.
5. Oral medicines : To continue for one month more, after four sittings of *Jalauka Avacharana*

Conclusions :

1. **Mild improvement in tortuosity** of the veins but marked improvement in the complaints of *daha*, *shula* and blackish discolouration of the skin
2. ***Jalauka Avacharana*** : Brought down the *shotha*, *shula* and *Daha* (burning sensation) by relieving local congestion and by *sheeta* nature of *Jalauka*
3. ***Arshakuthara rasa*** : It helped in relieving the tortuosity as *arsha* and varicose veins have same pathology
4. ***Kaishor Guggulu*** : It along with *Jalauka Avacharana* brought relief in pain due to its anti-inflammatory action
5. ***Sahapan* of *Mahamanjisthadi kwatha*** : Helped in relief due to its *ushna-tikshna* and its *rakta shuddhikara gunas*

Comments : Clarity of treatment scheduling and quantitatively measured effects of the treatments are not available in the article. Inconsistency is present in the presentation. The treatment duration has been mentioned as 2 months, etc. *Raktamokshana* has been reported, sometimes as four times, and at other times as weekly. Similarly, sometimes as markedly improved and at other times as complete relief in *Daha* and *Shotha*, etc.

This is confusing.

Tenth¹⁰ is a review article mainly of advisory nature. Several suggestions have been listed for awareness and some for adoption by the patients suffering from varicose veins (*Sira Granthi*). Selective physical exercises, *Yoga* exercises, swimming, cycling, dietary regimes and common herbal remedies and herbal medicines have been suggested for adoption by the patients and the physicians. The article has systematically described the occurrence of varicose veins, and the same is briefly sketched in below :

1. *Sira Granthi* gradually develops in a person undertaking excessive exercise, etc., affecting his network of veins due to vitiated *Vayu Dosha*.
2. The *vitiated dosha* compresses, squeezes and dries up and produce *granthis* in the affected *siras* (veins), which are raised and circular in shape
3. These veins become Swollen and are Bulging
4. The twisted bluish veins visible just beneath the skin, filled with abnormal blood, are known as varicose veins
5. These varicose veins may be Superficial (just below the skin surface with filled capillaries) or deep (located deep beneath the muscle).

6. This transformation takes place due to the vitiated *Vayu*, causing the irregular functioning of the valves of the affected veins
7. Any condition that puts excessive pressure on the veins makes them dilated and twisted.
8. The varicose veins commonly occur in the lower limbs because of **erect posture** and **long column of blood pools** in both legs because of **gravitational pull**.
9. This gravitational pull depending on its size, causes pressure on the veins, ultimately damaging the blood vessels.
10. This leads to their weakness and incompetence, ultimately developing varicosities.

Comments : The article is merely for awareness, advisory and popularity of the varicose problem, etc. To that extent it has fulfilled its purpose.

Eleventh¹¹ is a general type of popular article on varicose veins disease correlated with the *Siraja Granthi Vikriti* of *Ayurveda*. Only general indications and suggestions have been made for adopting the common *Ayurvedic* herbs and home made remedies. The article is a close replica of the 2nd

article discussed above, and so need not be elaborated again.

Twelfth¹² is a clinical study of a female patient of 60 years, suffering from varicose veins.

The patient presented the complaints of

- **Pain** : In the lower limbs from calf to the dorsum of foot of both legs
- **Dull aching pain** : Associated with throbbing sensation in the foreleg and ankle region of the left leg
- **Pain aggravated** : On long standing especially in the evenings and night hours accompanied with slight swelling at the left ankle region from last 3 months
- **Prominent, dilated, tortuous veins** : At the antero-medial aspect of the lower 1/3rd part of the leg as well as postero-lateral aspect of the calf region of left leg of 15 years standing
- **Burning sensation** : On both soles from last 3 months.
- **Difficulty** : In passing stool and irregular bowels

Examination revealed :

- **Pain** : Present
- **Pain Relief** : On elevation of legs
- **Swelling** : Present

- **Dilated tortuous veins** : Present in the foreleg as well as in the calf region
- **Mild swelling** : Seen in the left ankle region
- **Slight bluish discolouration** : Was visible
- **Ulceration** : Absent
- **Mose's Sign** : Slightly positive

Diagnosis : *Siragranti* (varicose veins) was diagnosed on the basis of the symptoms present.

Medication Planning : *Siraja Granthi* is a *Raktadushti Vikara*, therefore the following types of medications were planned :

1. Removal of Vitiated Blood : *Raktamokshana*
2. Blood Purification : *Rakta prasadana* internal medicines
3. Correction of Vitiated *Vata* : *Vatanulomaka* medicines

Treatment Schedule :

Day-1 : Prescribed :

1. *Amruthotharam Kashayam* & *Vasaguluchyadi Kashayam* : 20 ml *Kashayam* with 60 ml warm water BID

2. ***Kaishora Guggulu*** : 1 tablet BID with *Kashayam* & 1 teaspoon of *Soorनावaleham* at bed time
3. ***Sarvanga Abhyanga*** : With *Pinda tailam* for seven days

Day-2 onwards : Prescribed :

1. ***Lepam*** : With *Gruhadhoomadi Choorna* mixed with hot water for both the legs from below knee
2. ***Siravyadham*** : Three *Siravyadham* sittings on alternate days prescribed within 10 days of admission
3. **First sitting** : *Siravyadham* 100 ml of blood was removed
4. **Second sitting** : *Siravyadham* 90 ml of blood was removed
5. **Third & final sitting** : *Siravyadham*) 80 ml of blood was removed

On Discharge : Prescribed :

1. *Mahamanjishtadi Kashayam* : 20 ml of warm *Kashyam* morning and evening
2. *Kaishora Guggulu* : 1 tablet in the morning, afternoon, and evening
3. *Madhuyashtyadi tailam* : External application

Conclusions : After the completion of the 10 days clinical period following results

were found :

1. Pain, swelling and burning sensation reduced considerably
2. Dilated and tortuous veins in the lower leg reduced in size
3. Bluish discoloration present in the dilated veins, reduced considerably
4. *Siravyadham* along with internal medication reduced the signs and symptoms of *Siragranthi*, especially the *Sula*, *Daha* and *Vaivarnya* (discolouration)
5. No aggravation was seen after the two weeks follow up period

Comments : The study presented encouraging results, but medication was just for 10 days for such a chronic disease appear to be too short. The medication should have continued at least for about one and half month more to achieve endurable cure. The presentation could be improved significantly. Results should have been quantified. Write up need to be more concise and to the point.

Thirteenth¹³ is a case study of a 30 year old male patient of varicose ulcer.

Chief complaints :

- Pain
- Swelling over left lower leg
- Infected wound on medial aspect of left leg
- Skin discoloration and serous discharge from the wound from last 2 years

In *Ayurvedic parlance*, varicose ulcers' signs and symptoms closely correlate with *Siragata Vata janya vrana*.

According to **Sushruta Samhita** the treatment regime for *Siragata Vata* includes local oleation fomentation along with Leech therapy.

Treatment Schedule : Based on Leech therapy along with **oleation fomentation :**

1. **Wound :** Assessed and washed with Normal Saline
2. **Leeches :** Six in number applied all around the lesion
3. When Leeches left the site by their own (after about 30 min.) :
 - Wound was cleaned
 - Wound was dressed with guage piece soaked in *Yashtimadhu Ghrita*
4. **Leech therapy :** Repeated weekly in 4 sittings
5. **Prescribed :** *Sariva Ghana Vati* 2 Tablets of 250 mg TID internally
6. **Prescribed :** *Dhara sweda* daily for 20 minutes (excepting Leech therapy day)

with lukewarm *Tila* oil (sesamum indicus) adjuvant to Leech therapy

7. Duration of treatment schedule : 30 days

Property of *Tila* oil fomentation therapy

: It improves :

- Blood circulation
- Corrects skin discoloration
- Pacifies venous valvular dysfunction
- It, thus breaks the varicosity pathogenesis at cellular level and helps wound healing

Property of *Yashtimadhu Ghrita* :

- It has both *Vedana shamaka* and *Vrana ropana* properties
- It helps wound healing and relieves pain too

Property of *Sariva Ghanvati* :

- *Sira* and *Snayu* are the *updhatus* of *Rakta*
- *Sariva Ghanvati* has *Rakta prasadniya* property
- It facilitates New Healthy tissues formation & strengthens the blood vessels, thus corrects venous valvular dysfunction

Results : The varicose wound was completely healed within 30 days i.e. patient was cured from a non-healing ulcer.

Comments : The successfully healing a varicose ulcer in a period of 30 days, is encouraging. A statistically planned larger clinical study with these successful treatments should be conducted at institutional level, for generalization of the results, and only then subsequent adoption by the physicians and surgeons should be recommended.

Fourteenth¹⁴ is a general awareness type of popular presentation on Leech therapy (*Jalauka Avacharana*) in a varicose ulcer, mostly occurring in the lower limbs. The article describes the details about *Jalauka Avacharana*, their types, suitable time for their catching, preservation, and the procedure for their use in *Raktamokshana*, which are briefly discussed below:

Procedure of *Jalauka Avacharana* involves three steps :

1. ***Purva karma* (pre-operative procedure):** The patient should be made to sit or lie down. The site of the lesion should be dried by rubbing with powdered cow dung.

2. ***Pradhana karma* (operative procedure):** It consists in first preparing the Leech for applying on the ulcer lesion for sucking the vitiated blood. When there is pricking pain or itching (started sucking healthy blood), the leech should be removed.

3. ***Paschat karma* (post-operative procedure):** The leech should be made to vomit the whole sucked blood by adopting the proper procedure etc.

Uses of Leech Therapy :

The signs and symptoms of Venous ulcer resemble with those of *Siragata Vata*. The *lakshanas* of *Siragata Vata* are : *Sula* in *Sira*, contraction & engorgement of *Sira*, etc.

The chief uses of Leech therapy are :

- It is the preferred *Raktamokshana* mode for *Siragata Vata* in *Ayurveda*
- It is most frequently used in removing the local venous congestion or hematoma
- It avoids the need for surgical intervention
- It helps in tissue reconstruction by providing a temporary venous outflow of critical venous congestion

Comments : The article made a good attempt to popularize the traditional *Ayurvedic* concept of *Raktamokshana*

through the safe and simple Leech therapy in venous congestions.

Fifteenth¹⁵ is a dissertation submitted for masters' degree in Shalya Tantra. It lists the drawbacks of modern system in the management of varicose veins.

The dissertation points out that the risks of sclerotherapy of modern system are :

- New varicose veins may develop after the procedure
- Venous thrombosis
- Severe inflammation
- Cutaneous ulcerations
- Deep vein thrombosis
- Severe headache
- Transient blindness
- Stroke
- Death

The dissertation correlates varicose veins with *Siraja granthi* :

Signs and symptoms of *Siraja granthi* indicate its similarity with Varicose veins

(Table-4).

Surgical treatment commonly practiced with ligation and stripping procedure :

- It is an invasive procedure
- It may be complicated by hematoma formation
- It may become complicated by infection
- It may lead to saphenous nerve irritation

Complications of surgery include :

- Considerable bruising
- Small area numbness
- It may be associated with intense tingling pain (saphenous neuralgia, sural nerve injury)
- It may lead to postoperative thrombosis
- Superficial thrombo phlebitis
- Infection
- Heamatoma formation
- Reccurence

| Table-4: Correlation between <i>Siraja granthi</i> and varicose veins | | |
|--|--|--|
| Involved structure | <i>Siraja granthi</i> | Varicose veins |
| | <i>Siras</i> | Veins |
| Symptoms | <i>Sampeedya, Nispuram, Nirujam.</i> | Diffuse dull ache pain |
| Signs | <i>Sankochya, Vrutta, Unnata, Vakrikrutya, Shopham</i> | Dilated, elongated and tortuous vein, Superficial thrombophlebitis |

- The signs & symptoms are similar in both *Siraja granthi* and varicose veins
- Modern system aims to strengthen the veins' wall and valves, to achieve, good venous flow from the lower extremities and to remove varicosity
- The *Ayurveda* also serves the same aim, through external application of *Sahacharadi taila*, internal *vatahara basti*, and Para-surgical procedures of *Jalauka Avacharana* and *Siravyadha* but without any side effects

Comments : Clinical part of the dissertation has not been considered in the present review. The similarity of the signs and symptoms described by the dissertation, demonstrate the synonymy of *Siraja Granthi* and varicose veins diseases. The *Ayurvedic* approach of *Raktamokshana* along with internal and external medications have over-riding advantages over the modern system based approaches. The dissertation made a useful presentation.

RESULTS AND DISCUSSION

The varicose veins *per se* has no distinct disease category in *Ayurveda*, but in the light of the fore-going presentations from the different articles, etc., it should be, once for all accepted, the SYNONYMY of

Siragranthi : a type of *Ayurvedic granthi roga* located in the *Siras* (veins) and is due to the vitiated *Vata*, with the **Varicose Veins'** disease of the modern system.

Process of *Siragranthi* Formation :

1. As per *Ayurveda*, the excitatory factors of *Siragranthi* are the regular excessive and strenuous activities putting pressure on the network of veins. Presence of vitiated *vata* in these sites, compresses, squeezes and dries up the network of veins, leading to the production of *granthis*, which are the raised and circular glandular inflammations.
2. If the contrary conditions are not rectified, these swollen, bulging and twisted bluish *siras* (afflicted with swollen *granthis*) gradually get filled with unhealthy (vitiating) blood, and are then known as **varicose veins**.
3. Physiologically, this is due to the faulty or irregular functioning of veins' valves, and weakness in the walls of the veins.
4. It is a simple matter to recognize the fact that any condition that **puts excessive pressure** on the *siras* makes them **dilated** and **twisted**.
5. *Sira Granthis* (Varicose veins) most

commonly occur in the lower limbs because of the :

- Erect posture of body and legs
 - Long column of blood pools present in both the legs
 - Continuous downward pull of the gravity (of earth) on the blood pool in the legs i.e. blood cannot smoothly and easily (without obstructive force) retrace to the heart
6. This continuous pressure on the veins, gradually disturbs and damages the blood vessels' mechanism leading to varicosities.

The common causes which help generate pressure on the legs :

- Standing for long periods of time
- Sedentary lifestyle
- Tight clothing
- Chronic constipation
- Excess toileting time with squat position
- Dietary deficiencies
- Extra precautions in old age (ageing leads to loss of skin elasticity as well as thinning of veins)
- Overweight
- Hormonal imbalance during pregnancy and menopause in females etc.
- Incidence of chronic diseases such as diabetes, obesity, tumours, etc.

The above mentioned causes obstruct the smooth flow of the venal blood. This puts pressure on the veins, leading to inflammation inside the veins, gradually heading towards varicosity along with other associated complications.

Ayurvedic Management of Varicose Veins

Raktamokshana : It (*siravedha*) is the first and **primary treatment** for *Siragranthi* in *Ayurveda*. It can be performed through :

1. Jalauka Avacharana (Leech therapy)
2. Incision in the veins (Vein puncture)

Leech therapy is safe and easier. Leeches are applied adopting the well proven method on the site of varicose veins. The Leeches will suck out the vitiated stagnant blood as well as reduce the local pressure on the veins and surrounding area. Immediate relief in pain and discomfort will be experienced by the patient. Full drainage of the vitiated blood may require multiple sessions of leeches at intervals. It may be **remembered** that the relief provided by the *Raktamokshana* therapy may not be **permanent**. Even in the great classical *Samhitas*, it has been clearly, mentioned that this therapy is just an *Ardha Chikitisa*, meaning that for permanent cure, there is a need to adopt the

relevant internal, and external medications depending up on the *lakshanas* and vitiated *doshas* present, along with observance of certain **dos** and not **do not dos**. Internal medications are the appropriate drug compounds, external medications are the massages with prescribed oils, as **churned out** from the review articles discussed above, etc. are described as follows :

A. Ayurvedic Drug Compounds recently found suitable in Varicose Veins' management

- **Amruthotharam kashayam** : *Puranajwara* (prolonged fever), *Vatarakta* (gout), *Amapachana*, *kamala* (jaundice).
- **Vasaguluchyadi kashayam** : *Pandu* (anemia), *Raktapittam* , *Kamala* (jaundice)
- **Mahamanjishtadi Kashayam** : *Vatarakta* (gout), *Supti* (numbness), *Ardida* (facial paralysis)
- **Kaishora Guggulu** : *Vatasonita* (gout)
- **Sooranavaleham** : *Mudhavata* (obstructed *vata*), *Malabandha* (constipation), *Mandagni* (less digestive fire)
- **Gruhadhoomadi Choornam** : *Vatashonita* (gout), *Kaphaja Vatarakta*
- **Sahacharadi Kashayam**
- **Sariva Ghana Vati**

B. Ayurvedic Massage Oils recently found useful in Varicose Veins' treatment

- **Pinda Tailam** : *Vataraktam* (gout)
- **Madhuyashtyadi Tailam** : *Vatashonita*, *Pittavikara*, *Daha* (burning sensation), *Artii*
- **Tila Oil**
- During Massage, apply tension onto the muscles in the upward direction of the legs

C. Yoga Asanas : Aim is to naturally, retrace the stagnant venal blood from the limbs to the heart, using the force of gravity of earth. This will reduce the pressure on the veins in the limbs, apart from other benefits associated with Yoga.

1. **Viparita Karani Asana** : Raise the legs up the wall as much as with ease. It is a simple, easy, effective and riskless *asana*. It should be done empty stomach in the morning for 5 minutes, repeated 3 to 4 times, with inter-between rests of 4-5 minutes. Gradually, increase the duration from 5 to 15 minutes, and may reduce number of repetitions if so desired. Benefits of *Sarvang Asana* & *Shirsha Asana* can also be accessed with this *Asana*, by slightly increasing the erectness of the legs up the wall, but

not recommended to persons uncomfortable to this modification. This is a **versatile patient friendly Asana**, and it should be adopted, for **everything to gain and nothing to loose**.

2. **Sarvang Asana** : It is similar to *Viparita Karani Asana*, but slightly more difficult (and risky for patients). Its posture is more erect than the *Viparita Asana*, and is done without the support of wall. All persons may not be able to perform it comfortably. Help of the wall may be taken if required. Same timings may be observed.
3. **Shirsha Asana** : It is again similar to *Viparita Karani Asana*, but more difficult (more risky for patients). It is not recommended for elderly and females, and delicate persons. Same timings may be observed.
4. **Vriksha Asana** : It is similar but more difficult than *Shirsha Asana*. It is not recommended for varicose veins' patients.
5. **Hala Asana** : It is a still more difficult *asana* and comparatively with lesser benefits in comparison to the above mentioned *asanas* in varicose veins. Hence, it is not recommended.

6. **Asana while lying on the bed** : Keep the legs in raised position by placing them on pillows etc.

D. Simple regular exercises : Like, walking (short duration), swimming, cycling (short duration) etc. improve muscular function, blood circulation etc.

E. Asanas or Postures and Physical Exercises to be avoided

- o **Hanging or Swinging Legs** : While sitting on the chair or bed, etc. e.g. people normally hang or swing their legs. Long duration such sittings should be avoided or reduced to the minimum.
- o **Standing Postures** : Long duration standing postures, walking, running, cycling, etc. should be avoided.

F. Crape bandage application : It checks the vein dilatation and ulcer formation, and thus promotes circulation.

G. Dietetic options : Opt for fibrous and unpolished diet, carrot and spinach juice daily suffices vitamin deficiencies in the legs.

Relative merits of Ayurvedic procedures for managing Varicose Veins :

2. Physicians and patients should opt for natural, patient-friendly *Ayurveda* as an effective alternative to surgery, laser procedure and catheter insertion.

3. The modern system based medical procedures have the risks of side effects.
4. The patients are not required to get their veins surgically removed in *Ayurvedic* procedures.
5. The patients get a natural, safe and cost effective, alternative to a risky procedure.

CONCLUSION

The essence conclusions of this review are mentioned as follows :

1. The *Ayurvedic Siraja Granthi & Siragata Vata rogas* are synonymous with the modern system disease of varicose veins.
2. *Raktamokshana* is the **primary** *Ayurvedic* medication against Varicose Veins.
3. *Raktamokshana* through *Jalauka Avacharana* is the preferred option on account of its simplicity, ease, etc., but that **alone is not enough**.
4. Prescription of **secondary medications** i.e. internal and external medications is essential for securing an **enduring cure**.
5. Internal & external medications are often needed to be continued longer

than found in the articles reviewed, of course depending upon the signs and symptoms of the patient.

6. External medications should include *Yoga Asanas*, especially the *Viparita Karani Asana* on a regular basis.
7. Recommendation of **Diet Regime, Dos** and **do not Dos** should be included in the prescriptions.
8. Modern system based treatments of varicose veins have many side effects apart from higher chances of recurrence, etc.
9. The studies reported in the review are mainly case studies, even the other few ones required prolonging of the treatment schedule, etc.
10. **Lastly**, conduct of just case studies would not lead to **anywhere. Institutional**, statistically well planned studies are required to be conducted to come out with adoptable findings.

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REFERENCES

1. Arunbabu PS, Shailaja SV. Effect of *Jalaukavacharana* on varicose veins - a case study. IAMJ. 2015; 3(6), pp. 1883-87.
2. Mor D, Dande P. Varicose veins: an overview of current and herbal treatments. IJPSR. 2017; 8(5), pp. 1959-66
3. Choudhary NR, Kumar H. *Siravedha* - a literary review. IJAAR. 2018; 3(7), pp. 1113-16.
4. Dagu MB, Mashetti NB, Baragi UC. To evaluate the efficacy of *Siravyadha* and *Basti* in the management of *Siraja Granthi* (Varicose Vein) - A Comparative Clinical Study. JAIMS. 2017; 2(5), pp. 40-46.
5. Shetty KK, Rao SSM, Fathima SA. A Case Report on *Siraja Granthi*. JAIMS. 2017; 2(4), pp. 332-336.
6. Saurabh, Rakesh RN. Management of Varicose Eczema through *Ayurveda*. JAMS. 2017; 2(1), pp. 144-147.
7. Aosemba J, Prasanth D, Bhatted S. A systematic *ayurvedic* approach on the management of varicose veins: a case series. IAMJ. 2019; 7(8), pp. 2122-28.
8. Sharma M, Sukesh A. A review on importance of *raktamokshana* in management of varicose vein and varicose ulcer. WJPPS. 2018; 7(9), pp. 430-435.
9. Kubavat HK. Role of *Jalokaavacharana* in the management of *Sirajgranthi* (varicose veins) - A case study. IJACARE. 2018; 2(1), pp. 30-35.
10. Kumar M. Scope of *Ayurvedic* Drugs and Leech therapy in Management of Varicose Vein of Lower Limb. JBSO. 2014; 2(1), pp. 121-123.
11. Garg N, Jain A. Ayurvedic Perspective of Varicose Veins. WJPR. 2017; 6(3), pp. 296-310.
12. Dharmarajan P, Anandraman PV. A case study on the *Ayurvedic* management of varicose vein. GJRMI. 2016; 5(1), pp. 41-48.
13. Dwivedi A. Management of non healing varicose ulcer in *Ayurveda*. IAMJ. 2019; 1(3), pp. 1-6.
14. Prakash A, Parikshit D. A review on the role of *Jalaukavacharana* (Hirudotherapy) in the management of venous ulcer. UJP. 2013; 2(4), pp. 38-43.
15. Nadaf AN. A study on *siraja granthi* and its management with *punarnavadi guggulu* and *nimbadi guggulu* - A comparative study. Submitted to RGUHS, Bengaluru. R2009-10: pp. 1-104.