

A REVIEW STUDY OF DOPPLER ULTRASOUND- NON INVASIVE DIAGNOSTIC IMAGING -AN AYURVEDIC PERSPECTIVE

Aarti Bobade*¹, Pranali S. Bhende² and G. H. Kodwani³

¹P.G. Scholar, ²Asso. Professor and Guide, ³Head of Department

Department of Roganidan-Vikruti Vidnyan, Government Ayurved College & Hospital,
Nagpur.

Article Received on
08 April 2019,

Revised on 29 April 2019,
Accepted on 19 May 2019

DOI: 10.20959/wjpr20197-15006

*Corresponding Author

Aarti Bobade

P.G. Scholar, Department of
Roganidan-Vikruti Vidnyan,
Government Ayurved
College & Hospital, Nagpur.

ABSTRACT

Ayurveda is ancient science of life, having unique diagnostic tools. For the proper diagnosis of disease *Nidanpanchaka* and various examinations are described in Ayurveda. In ayurveda Acharya Charak and Acharya Vagbhat has described, there are some diseases for which *Shit, Ushna, Snigdha and Ruksha* treatments are not applicable then consider that disease as a *Raktaj vyadhi* and give them treatment accordingly. This diagnosis of *Raktaj vyadhi* is depends on *Upshaya – Anupshaya* which is time consuming and suffering is more. Also, diseases having deep root examined on the basis of *Upshaya – Anupshaya*. Vascular diseases are condition, which affect patient's

vascular system. They are common and serious. Diseases like Coronary Artery Disease, Renal Vein Thrombosis, Portal Vein Thrombosis, Carotid Artery Diseases, Pulmonary Embolism, Deep Vein Thrombosis, Aneurysm, Atherosclerosis etc are life threatening diseases. In such cases diagnostic testing is very important for diagnosis, monitoring and prognosis of disease. So the diagnostic technique is the need of the era and it is good to have fast results without any side effects. That is just in case of Doppler Ultrasound which gives a way to see what going on inside the body without any painful procedure. Doppler ultrasound is noninvasive diagnostic technique in which high frequency sound waves are used to visualize blood vessels of the body. It is alternative to arteriography and venography. It gives information about blood vessel, constriction, blockage, blood clot, in pregnant woman blood supply to placenta and fetus. With the help of Doppler, ayurvedic diagnosis of *Raktaj vyadhi* is easy and fast. Also results of ayurvedic treatment like *Raktamokshana* on *vyadhies* of

blood vessels can be determined by seeing before and after t/t imaging. So, this study was to elaborate an ayurvedic perspective to Doppler Ultrasound.

KEYWORDS: Doppler Ultrasound, Blood Vessel Disorder.

INTRODUCTION

Vascular system is circulatory system made up of vessel i.e. artery, vein and capillaries that carry blood and lymph through body. It maintains cellular homeostasis.^[1] It plays an important role in various system of body as function of blood vessel include supplying all organs and tissues of the body with oxygen and nutrients, Removal of waste products, fluid balance and other functions.^[2] There are 100,000 miles of blood vessels in the adult human body. Any problem along this vast network of blood vessel can cause severe pain, disability and death.^[3] So, conditions that affects vascular systems are common and life threatening.

Conditions of blood vessels include^[4]

- Atherosclerosis – plaque made up of fat, cholesterol, calcium and other substance builds up inside artery.
- Aneurysm – a bulge or ballooning in wall of artery.
- Blood clot- including deep vein thrombosis and pulmonary embolism.
- Coronary artery disease- in which heart attack, angina signs are seen.
- Cerebrovascular disease- stroke ischemic attack are seen
- Peripheral arterial disease- Raynaud's disease, burger's disease.
- Vascular disease of great vessels – Aortic aneurism
- Thorasic vascular disease- thorasic aortic aneurism
- Peripheral venous disease- DVT, Varicose vein.

These diseases of blood vessels are common and important to diagnose as early as possible. In *Ayurveda* these diseases are considered as *Raktaj Vyadhi*. There are some diseases for which *Shit*, *Ushna*, *Snigdha* and *Ruksha* treatments are not applicable then consider that disease as a *Raktaj vyadhi*^[5,6] and give them treatment accordingly. This diagnosis of *Raktaj vyadhi* is depends on *Upshaya – Anupshaya* which is time consuming and suffering is more. In such diseases diagnostic tool like color Doppler is very important and significant. Doppler ultrasound is noninvasive diagnostic technique in which high frequency sound waves are used to visualize blood vessels of the body. It is alternative to arteriography and venography.

It gives information about blood vessel, constriction, blockage, blood clot, in pregnant woman blood supply to placenta and fetus.^[7]

With the help of color Doppler, conditions of blood vessels are clearly seen which helps in modern diagnosis and its correlation with *Ayurvedic Samprapti*.

Also with the help of color Doppler management of blood vessel disorder by Ayurvedic preparation (*Raktaprasadak & Raktashodhak*) and one of the *Panchakarma* therapy like blood letting (*Raktamokshan*) are analyzed by taking images of blood vessels before and after treatment.

AIM: To study Doppler ultrasound imaging.

OBJECTIVES

- 1- Application of color Doppler as non invasive diagnostic method to interpret ayurvedic samprapti vidnyan.
- 2- Application of color Doppler to study effect of ayurvedic treatment in blood vessel disorders.

Ultra-Sonography

Ultra sonography is medical sonography in which high frequency sound waves are used to visualise blood vessels of the body. It is of three types.^[8]

- 1- Continues waves
- 2- Duplex
- 3- Color Doppler

Color Doppler

A Doppler ultrasound is a risk free and pain free procedure that requires little preparation. Color images of blood vessels are obtained from color Doppler. Arteries are seen in red color, veins are seen in blue color. It is part of blood flow study.

Indications

Leg pain, doubt of claudication, decreased blood supply to muscles of leg and hand. Risk of DVT, varicose vein AVN. In pregnant woman to visualize placenta and blood supply to fetus. To visualize kidney in post transplant.

Preparation

There is no need for much preparation for this test.

Half to two hours before test nicotine products should be avoided.

Cigarette and tobacco chewing should be avoid as it causes vaso-constriction and false results may be obtained.

Procedure^[9]

- Part that will be studied should be necked.
- Patient should be lie down on bed or table.
- Water soluble gel placed on hand held device called transducer. It directs the high frequency sound wave into artery and veins being studied.
- Images are created as the transducer pressed against your skin.
- Transducer sends sound waves through your skin and other body tissue to the blood vessel. The sound waves echo off your blood vessel and send information to a computer to be processed and recorded.
- The computer will produce graph or picture that shows the flow of blood through artery and veins.
- The transducer will be moved to different areas of comparison. You may hear a 'whooshing sound' as blood flow detected.

Generally there is no need of any instructions after the procedure.

DISCUSSION

Normal results indicate that you have no narrowing or blockages in your blood vessels. It also means blood pressure in your vessels are normal.^[10]

Abnormal blood flow pattern indicates narrowing and closing of the vessels valves. In *ayurveda* four general signs of *Srotas Dushti* are seen namely *Atipravrutti*, *Sang*, *Siragranthi* and *Vimargagaman*.^[11]

From the study of Color Doppler, correlation of modern diagnosis regarding blood vessel disorder and above *Stroto Dushti lakshan*, can be possible -

- Blockage in the arteries which may be due to build up of cholesterol and other substance is may be *Sanga* type of *Strotodushti lakshan*.
- Blood clot in artery or vein may indicates *siragranthi* type of *strotodushti lakshan*.

- Aneurysm & poor circulation which can be caused by damaged blood vessels indicates *Vimargagaman*.
- Coronary artery disease indicates *Sanga* type of *strotodushti lakshana*.

Hence from above observation it is easy to correlate modern diagnosis with *Ayurvedic Strotodushti* types, which helps to understand the *Samprapti* hence one can achieve *samprapti bhanga* which is ultimate aim to treat the patient. Analysis of *ayurvedic* preparation (*Raktashodhak & Raktaprasadak*) and one of the *Panchkarma* therapy like blood letting (*Raktamokshan*) can be observed by Doppler ultrasound.

CONCLUSION

- With the help of Doppler ultrasound diagnosis of *raktaj vyadhi* is easy and fast
- Correlation of modern diagnosis and interpret *ayurvedic strotodushti* type can be possible
- Analysis of *Ayurvedic* treatment on blood vessel disorder is easy.

REFERENCES

1. Pugsley M K¹, The vascular system an overview of structure and function, J Pharmacol toxiol method, Sep-Oct, 2000; 44(2): 333-40.
2. <https://medlineplus.gov/vascular diseases.html>
3. <https://vascularcures.org/what-is-vascular-disease>
4. <https://www.hopkinsmedicine.org/health/conditions-and-diseases>
5. Acharya Priyavat Sharma, Charak Samhita, Chaukhamba Sanskrit Prakashan, Delhi, 323.
6. Vd P. G. Athavale, Drushtarth Ashtang Hrudayam, Godavari Publishers and book promoters, first edition, 2007; 258.
7. <https://www.medifree.com/tests/colour-doppler-cost/>
8. <https://www.medifree.com/tests/colour-doppler-cost/>
9. <https://www.healthline.com/health/doppler-ultrasound-exam-of-an-arm-or-leg>
10. <https://www.healthline.com/health/doppler-ultrasound-exam-of-an-arm-or-leg>
11. Acharya Priyavat Sharma, Charak Samhita, Chaukhamba Sanskrit Prakashan, Delhi, 592.