IAMJ

INTERNATIONAL AYURVEDIC MEDICAL JOURNAL

Research Article ISSN: 2320-5091 Impact Factor: 6.719

CRITICAL ANALYSIS OF THERAPEUTIC PHLEBOTOMY W.R.T RAKTA MOKSHANA IN AYURVEDA

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https://doi.org/10.46607/iamj03p6052022

(Published Online: September 2022)

Open Access

Article Received: 26/08/2022 - **Peer Reviewed:** 24/09/2022 - **Accepted for Publication:** 30/09/2022

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ABSTRACT

Rakta Mokshana is a unique procedure in Ayurveda that is used in several conditions when the *Doshas* are accumulated in the blood. *Rakta Mokshana* which is also called bloodletting by a layman has been used as curative and preventive therapy for many conditions for centuries. Bloodletting can also be traced back to ancient Greek civilization. Even though there are different methods of bloodletting mentioned in classical works of Ayurveda, the author will be dealing with venesection or *Sira Vyadha* in the present article and has attempted to compare it with therapeutic phlebotomy in modern medical practice.

Key words: *Rakta Mokshana*, Therapeutic phlebotomy, *Sira Vyadha*

INTRODUCTION

Phlebotomy is the technical term used for bloodletting in modern medical practices. Ayurveda which has been in practice for more than three millenia has codified the practice of bloodletting and has given detailed instructions for dos and don'ts's in bloodletting. Even though the practice of bloodletting was prevalent in in western world for centuries, there were no codified instructions or scientific approaches to this therapeutic practice. One of the unfortunate and notorious events was the death of the first president of the United States of America Sir Washington, who was bled to death following a phlebotomy procedure for Acute epiglottis. In the western world, the practice of phlebotomy has evolved to be an extremely crucial diagnostic and curative tool in different conditions. This small article will deal with the therapeutic aspects of phlebotomy in light of *Sira Vyadha.* Therapeutic phlebotomy is a controlled removal of a

considerable amount of blood so as to reduce blood volume, red cell accumulation, increased volumes of iron in the blood, etc. Therapeutic phlebotomy is indicated in conditions like hemochromatosis, polycythemia vera, porphyria cutanea tarda, cor pulmonale, polycythemia secondary to arterio-venous fistula, hepatomegaly etc[1].

Hemochromatosis

It is a condition characterised by excess accumulation of iron in the blood. The condition is usually caused by a mutation in the HFE gene which regulates the absorption of iron from the food that is taken. A hormone called Hepcidin secreted by the liver regulates the absorption and use of iron in the body, in hemochromatosis the normal function of Hepcidin is hampered, causing the body to absorb more iron than needed. The excess iron is stored mainly in the liver, and over a period of time, the increased reserves of iron in the body start to accumulate in the heart, pancreas, etc and cause multiple organ failures. This can be classically understood from the point of *Rakta Pradoshaja Vikaras* mentioned in Ayurveda. The major treatment procedure indicated in Ayurveda for *Rakta Pradoshaja Vikaras* includes *Rakta Mokshana* (Phlebotomy), *Vamana*, *Virechana*, etc.[2] The major treatment procedure indicated for Hemochromatosis is Phlebotomy, till the ferritin level in blood comes down to < 50 mcg/L since Phlebotomy helps in the reduction of excess iron in the blood through bloodletting and more iron is used up during the process of erythropoiesis following the Phlebotomy. In this way, the iron in the blood is regulated. From an Ayurvedic point of view, the condition presents hepatomegaly and jaundice, which can be understood as a type of *Yakrit vikara* and the treatment procedure includes *Sira Vyadha* in the right arm.[3]

Chronic Hepatitis C

Hepatitis C is an infective condition caused by HCV or Hep C Virus of the genus Heapcivirus and family Flaviviridae. The condition is characterised by severe inflammation of the liver and splenomegaly, Portal hypertension, dark urine, poor appetite, fatigue, etc a clinical study conducted on 28 patients using Phlebotomy has shown marked improvement in the condition of patients. The aim of the study was to evaluate the role of reduced ferritin levels and the changes in oxidative stress in the liver. Mild accumulation of hepatic iron is common due to elevation of the serum Amino Transferase levels. Also, there is significant evidence that suggests that a diet with high amounts of iron has worsened the hepatic damage in HCV-infected primates and has resulted in the onset of Hepatic carcinoma. So, the recently growing evidence has proved that HCV proteins activate the formation of reactive oxygen species in the hepatocytes and the oxidative stress associated with HCV infection and accelerates the oxidative stress-mediated events which lead to hepato cellular damage as well as pro fibro genic activation of stellate cells of the liver. This study was also conducted to evaluate the changes in the level of serum ALT, AST, and GGT. At the end of the trial, there was a significant lowering of the Serum ALT, AST, and GGT in the patients. Therapeutic phlebotomy hence was proved to be an incredible therapeutic procedure in HCV patients in this clinical trial.[4] The HCV can be understood as *Yakrit Vikara* like hemochromatosis mentioned above, and one of the major treatment protocols for this condition in Ayurveda is *Sira Vyadha*, which again shows the significance of *Sira Vyadha* or venesection in the present era of modern medicine[5].

Portal Hypertension

It is a condition characterised by elevated pressure in the portal venous system. The most common cause of Portal hypertension is alcoholic cirrhosis of the liver. The major symptoms include Hematemesis, Ascites, Encephalopathy, Jaundice, Caput Medusa, etc. In recent studies using Therapeutic phlebotomy in this condition, it has been seen that there is a significant decrease in the Portal venous pressure, pulmonary capillary wedge pressure, Pulmonary Artery pressure, central venous pressure, and cardiac output. Phlebotomy proved to be a promising treatment for Liver cirrhosis. During liver transplantations procedures, which are done following advanced liver diseases, phlebotomy helped in reducing the loss of blood and thereby complications produced by bleeding during the surgical procedure and has given better results over phenylephrine administration. This condition can again be correlated with Yakrit Vikara in Ayurveda and as we have already seen that *Sira Vyadha* is indicated in this condition[6]. Further research can be conducted to validate the classical Ayurvedic perspective of *Rakta Mokshana*.

Polycythemia vera

Polycythemia Vera is a condition characterised by excess production of Red Blood cells in the body. These excess cells result in increases in the viscosity of blood resulting in the formation of clots, embolus, etc. This condition is characterised by symptoms of dyspnoea, unusual bleeding like epistaxis, etc. One of the major treatment protocols indicated for this con-

dition is therapeutic phlebotomy. Therapeutic phlebotomy in this case helps in the reduction of the excess number of red bloods in the blood. From an Ayurvedic perspective, this condition shows cardinal signs of *Rakta Vrddhi lakshana* and the treatment indicated is *Rakta Mokshana* or bloodletting using different methods depending on the condition of patients[7]. More studies can be conducted from an Ayurvedic perspective using the role of *Sira Vyadha* in *Rakta Pradoshaja Vikaras* and *Rakta Vrddhi*.

Porphyra Cutanea Tarda

PCT is a rare condition characterised by painful and blistering lesions of the skin that usually occurs after exposure to sunlight (Photosensitivity). Affected skin becomes fragile and blisters develop in the skin along with severe peeling. PCT is caused by a deficiency of an enzyme called Uroporphyrinogen Decarboxylase which is necessary for the synthesis of heme, either through mutation in later stages of life or may be acquired. It has been determined that the excess accumulation of iron in the liver is a major ground in the development of the disorder in individuals. The relationship between iron levels and PCT has been established and PCT is classified under iron-dependent disorders. The symptoms seen in patients correlate with increased levels of iron in the liver. Iron overloading of the liver maybe mild or moderate in PCT. Therapeutic phlebotomy reduces the excess iron in the blood, thereby reducing the iron overloading in the liver. Hence Phlebotomy is a major procedure indicated in PCT[8].

From an Ayurvedic perspective, PCT can be classified under *Kushta* which needs to be further studied. As *Rakta Mokshana* is indicated in *Kushta*[9], bloodletting from an Ayurvedic perspective is a felicitous treatment procedure for PCT.

Gouty Arthritis

A condition characterised by accumulation of uric acid crystals in the joints following elevation in uric acid levels in the blood and generally presents with inflammation of joints most commonly starting from the interphalangeal joints of Bigoted. This condition is co-related with *Vata-Rakta* in Ayurveda and is indicated for *Sira-Vyadha*. There are several aspects involved in the development of Gout, they are: -

1. Overproduction of Uric acid due to intake of excess purines in the diet.
2. Over production of Uric acid from ATP degradation.
3. Uric acid over production due to increased synthesis of purines.
4. Production of excess Uric Acid due to increased DNA breakdown following cell damage.
5. The binding of Sulphur and copper with molybdenum in kidneys causes decreased elimination of uric acid from the body.
6. Precipitation of crystals of sodium urate and iron in the joints due to high ferritin and saturated transferrin.
7. Inflammation develops due to the bonding of tyrosine with sodium urate iron crystals and results in the formation of tyrosine kinase.

Hence modern studies have shown that phlebotomy plays an important role in eliminating accumulated iron, and phlebotomy has been indicated as a major therapeutic tool in patients with gout along with yearly blood donation to eliminate the excess accumulated iron in the blood[10].

Sickle Cell Anemia

Sickle cell anemia is an inherited condition and comes under sickle cell disease. In this condition, the Red Blood Cells become crescent-shaped which decreases the surface area, and thereby the ability to carry oxygen is reduced in RBCs. The condition Acute sickle cell hepatic crisis is seen in patients with SCD. The manifestations range from hyper bilirubinemia to hepatic failure which is termed Sickle cell hepatopathy. Along with that, there is an increase in the viscosity of blood in sickle cell disease due to membrane rigidity of the deoxygenated RBCs in the blood, which causes Vaso-occlusive disorders. While phlebotomy has proved to reduce the viscosity of blood by reducing the volume and has shown promising results in preventing Vaso-Occlusive disorders in patients[11]. The condition has to be further correlated and studied under an ayurvedic perspective to further understand *Rakta Mokshana* in a condition like SCD.

Current relevance of *Rakta Mokshana*

Sira Vyadha which is a form of *Rakta Mokshana* is a type of *Pancha Karma* procedure that is classified under *Shodhana Chiktsa*. Acharya Sushrutha has considered *Rakta* to be the fourth *Dosha* and held *Rakta Mokshana* in high regard in treating multiple conditions. Many diseases are caused by *Dushita Rakta* and some of their comparative analysis with modern medicine has been mentioned above. The above list of diseases and their correlations are nowhere near completion and has been just a humble attempt to simply analyse the role of *Rakta Mokshana* from both Ayurveda and the western system of medicine. Appropriate application of *Rakta Mokshana* can

be a curative tool in many morbid conditions of the body as we saw above.

CONCLUSION

Ayurveda is a science of life, which aims to prevent and cure maladies of the physical body and psyche. *Rakta Mokshana* is a safe effective para-surgical procedure that can be lifesaving if administered judiciously and properly in different conditions. When the *doshas* in the blood accumulate abruptly and when *Shamana Chikitsa* fails to give appropriate results, Rakta Mokshana can be an incredibly potent procedure to treat patients. All the anatomical points told by the surgeon of the yore Acharya Sushrutha can be used as sites for venesection to remove *Dushita Rakta* from the body.

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Source of Support: Nil

Conflict of Interest: None Declared

How to cite this URL:Shreeram.P. A & K. Vasudeva Reddy: Critical Analysis of Therapeutic Phlebotomy w.r.t Rakta Mokshana in Ayurveda. International Ayurvedic Medical Journal {online} 2022 {cited September 2022} Available from: http://www.iamj.in/posts/images/upload/3653_3656.pdf