

Review Article

Exploring Therapeutic Phlebotomy (*FASD*) in the light of *Ilmul Amraz* (Unani Pathological Perspective)

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Abstract

Theories and philosophies of Unani medicine are based on the humoral theory postulated by Hippocrates 3000 yrs back. It is based on the concept of equilibrium and balance of natural body humours (blood, bile, black bile and phlegm). The imbalance in the quality and quantity of these humours leads to diseases whereas restoration of this balance maintains health of a person. Its treatment is a culmination of different regimens. Regimental therapy is one of them. It is among the non-medicinal procedures that are used for health promotion in Unani system of medicine. Phlebotomy/*Fasd* (blood letting through venesection) is one of the important methods of evacuation of morbid matter from the body for the preservation and restoration of health. Though venesection is in vogue but it has been performed by physicians in various civilizations since antiquity up to the present. The Unani physicians e.g. Galen, IbnSina, Razi, Majoosi, Akbar Arzani, Azam Khan & Kabiruddin has suggested *Fasd* as an adjuvant regimental therapy for the management of various types of disease. Currently, therapeutic phlebotomy is approved for three main indications: haemochromatosis, polycythaemia vera and porphyria cutanea tarda. This review focuses not only on the therapeutic applications of *Fasd* (venesection) as described in Unani medicine but also discusses three main indications by western medicine. Possible mechanism of action and standard operative procedures of *Fasd* (venesection) are also discussed.

Keywords: Hippocrates, *Fasd*, humoral theory, Regimental therapy, Phlebotomy

INTRODUCTION

Unani System of Medicine founded by Hippocrates in 460-377 BC is based on "Nazriya Akhlaat" (Theory of Humours) which supposes the presence of four bodily fluids

known as Akhlaat (Humours). Their misbalance or changes in their quantity and quality result in diseases, whereas restoration of the balance leads to health. This system of medicine describes 6 essential factors for

maintaining health and preventing diseases called *Asbab-e-Sittah-e-Zaruriah*. [1] In this system of medicine, the basic principle of treatment is *Ilajbilzid* i.e. treatment is in contrast to nature and *Mizaj* of the disease and is adopted in two ways i.e. observational and rational methods which are employed through diet, drugs, regimes, manipulation techniques and operations. [2] All diseases can be treated on by *Ilaj bit Tadbeer* (Regimental therapy), *Ilajbil Ghiza* (Dietotherapy), *Ilajbil Dawa* (Pharmacotherapy) and *IlajbilYad / Jarahat* (Surgery). [3,4] Unani physicians have also laid emphasis on *physic* (*Tabi'at*) by which body works physiologically and resists against infections (*Ta'diyah*). It is also called *Madicatrixnaturae*. If it is strong, the body functions smoothly; if it is weak, the risk of illness increases. [1] In Regimental therapy (*Ilaj-bil-tadbir*) Unani physicians have described various methods like cupping (*Hijamat*), massage (*Dalak*), exercise (*Riyazat*), Turkish bath (*Hammam*), venesection (*Fasd*), leeching (*Taleeque*), and cauterization (*Aml-e-Kai*) [2,4] These regimes are actually meant for the *Istifragh* (evacuation) of *akhlateradiya* (morbid fluids), responsible for the disease, from the body. As soon as these morbid humours are removed from the body, normal health gets restored. [5] Blood letting in the form of venesection, leech therapy and cupping with scarification is an essential part of regimental therapy [29,30]. Among these, *Fasd* (venesection) is one of the most important and widely practiced methods by Unani scholars. It has been utilized for preventive as well as therapeutic measures for thousands of years by ancient Unani physicians. [5] 'Phlebotomy' comes from the Greek word *phlebos*, meaning veins, and *tome*, meaning incision [6]. *Fasd* (Venesection) is a method of *Istifraghe damwi* (blood letting) which involves the withdrawal of blood in a considerable quantity from the vessels, by giving incision with the help of knife (scalpel & lancet). [4] It is a general eliminant for humors and excess of humors in the same proportions as is in blood vessels. [7,8] The

general indications of venesection are in *Damvi Amraaz* like *Shaqeeqa*, *Sarsam*, *Khunaaq*, *Ramaddamvi*, *Wajaulmafasildamvi*, *Judri*, *Khafqaan*, *Sakta*, *Irqunnisa*, *Zatulriya*, *Zataul janb* etc and in persons, who are prone to develop diseases due to excess of blood. In the former it is used for therapeutic purpose and in latter it is advocated for prophylactic purpose. In modern era, Venesection was begun to be questioned by European physicians and due to lack of evidence based research, it has lost its utility. [9]

Historical Background

Venesection is one of the oldest medical practices. The practice of phlebotomy (Greek *phlebos* = vein and *temnein* = to cut) has taken place for over five millennium. The Egyptians may have been the first to perform bleeding by scarification and there are two passages in the *Ebers Papyrus* that have been taken as evidence that scarification was an accepted procedure. The art of phlebotomy was flourishing at the time of Hippocrates (500 BC). Celsus, in 100 BC, was a strong advocate of bloodletting by scarification and cupping to relieve local conditions, but preferred resection for active disease. Galen (130–200AD) was also an advocate of bleeding and cupping, which was extremely popular in the latter years of the Roman Empire. Maimonides considered venesection necessary but hazardous and stated the patient had to recite to god for healing and after treatment to say 'Blessed art thou, Healer of the living'. In his *Laws of Moral Dispositions*, and more extensively in his *Medical Aphorisms*, he discussed the subject of bloodletting. He asserted that [34] one should not phlebotomise a youth younger than 14 nor anyone over the age of 70 years. Maimonides [35,36] further stated that the conditions and complications that militated against bloodletting were as follows: convulsive disorders, severe insomnia, anginal type pain, obesity, anxiety, fearful and cowardly predisposition, or someone not accustomed to giving blood or someone plagued by diarrhea and colitis. The frequency, timing, and site of

venesection, the quantity to be removed and other facets of bloodletting were discussed. During the procedure examination of the pulse was considered to be the most important. If one perceived that the pulse was changing either in its 'largeness or evenness', then phlebotomy was to be terminated.[10] Blood-letting was part of Arab traditional medicine and it was mentioned by Prophet Mohammed that there are three methods to cure illness: 'a drink of honey, a scratch of Hijamah and cautery'.¹¹ It was practiced by the Arab physicians of the Middle Ages and soon spread to the Middle East and eventually to the rest of Europe during the Renaissance. The Arabs had rules as to how much blood should be taken and when. Bloodletting was not recommended with a full moon or when the wind blew from the south.[10] They also taught that blood should be taken from a vein at a distance from the diseased part, and from the opposite side of the body. Phlebotomy was used as an analgesic by inducing syncope for conditions such as childbirth, fractures, dislocations etc. There were times when venesection was used as a non-therapeutic tool. Zenobia, a famous Arab queen, killed an Arab king, Jothima Al Abrash, with venesection.[11]

Ibn-Sina (Avicenna) stated in his book, The Canon of Medicine, the general indications for blood-letting:

- When the blood is superabundant that a disease is about to develop.
- When disease is already present.

He said that:

"The object in both cases is to remove the superabundant blood, to remove the unhealthy blood, or both. Examples of the first category are incipient sciatica, podagra (gout) and danger of hemoptysis from rupture of vessel in rare field lung, for superabundance of blood then makes the vessel liable to give away".[11]

The practice continued throughout the middle Ages but began to be questioned in the 16th century, particularly in northern Europe when *William Harvey* disapproved the practice of venesection in 1628 in the introduction of

scientific medicine, *La Méthode Numérique*. [11]

Therapeutic phlebotomy refers to the drawing of a unit of blood in specific cases like hemochromatosis, polycythemia vera, porphyria cutanea tarda, pulmonary edema, hypertensive encephalopathy etc., to reduce the amount of blood cells.[12]

Procedure of Venesection

Scalpel, Gloves, Cotton, Bandage, Antiseptic lotion, An aesthetic agent, and haemostatic drug like Sangejarahat, Dammulakhwain etc. and Emergency kit, these are the prerequisites for the procedure.

- Ask the patient to lie down, but the position can be changed according to the vessels to be incised.
- Identify the vessels with anatomical position which is to be used for venesection.
- Cleansing of the site of venesection by betadine solution and savlon or by any anti septic agent.
- Use of tourniquet or bandage to make the vessel prominent at 4 cm distance proximal to the site of incision.
- Sterilization of instruments like gloves, blade, scalpel etc.
- Apply anaesthetic agent at site of incision.
- Give incision according to disease and condition of patient.
- Monitor the condition of patient during the procedure. If any complication arises during bloodletting like syncope, vomiting, spasm etc. then stop the bleeding and treat the condition accordingly. While in absence of complications, Fasd should be stopped when speed of bloodletting becomes slow or when colour of blood changes from blackish to bright red or consistency of blood becomes thin.
- Finally, the whole area is then dressed and bandage.
- After venesection, patient is advised to bed rest for 6-8 hours.
- Patients are advised to avoid har foods and drugs, exercise and hammam.

- They are also advised to take light and easily digestible foods.[2,8,13]

The Amount of blood to be removed in venesection depends upon disease. In some diseases, profuse bloodletting is recommended while in some, minimal bloodletting is advised.[8,13]

Age: Between the ages of 14 to 60 years.

Season: The most suitable season for venesection is spring.

Time: Middle days of lunar month (12, 15, and 21) are supposed to be suitable for venesection at noon but at an emergency condition there is no any fixed time and day for venesection.[8,14,15]

These are the guidelines as described by Avicenna and other unani physicians regarding the procedure of venesection but in present era there is a need to develop standard guideline for the procedure of venesection that can be used for the therapeutic venesection. In present scenario WHO have given a guideline of SOP on the subject of collection of sampling. Similar guidelines may be used for therapeutic venesection.

Objectives of Fasd (Venesection)

- Maintenance of normal blood volume in the body to prevent the diseases occurring due to excessive blood volume.
- To check the diseases such as Zaght-ud-dam qawi (hypertension), Kasrat-e-tams (menorrhagia) and Ru'af (epistaxis) as excess of blood in the body is one of the causes of these diseases.
- There are several diseases which can be cured by fasd (venesection). These include Humma -e- ejaamiya (malaria), splenic disorders, Bawasee r-e- damvi

(haemorrhoids), Waram-e-khusiya (orchitis), Iltehab-e- raham (metritis), Jarbo- hikka (scabies and pruritis), Khuraaj (boils), Iltehab-e- kabid (hepatitis) and Ehtebaas-e- tams (amenorrhoea), inflammation of anus, rectum and penis, eruptions, throat diseases and abscess, arthritis, sciatica, hip pain and gout.

- To treat the ailments such as Aamraz-e jild (skin disorders) e.g. leucoderma, scabies, alopecia areata, Cardio-respiratory disorders, Nervous system disorders, Gynaecological disorders, Ophthalmic disorders.
- Toxicity and accumulation of waste matters in blood can be checked and prevented by fasd (venesection) as it excretes the waste matters from blood and various parts of the body.
- Stimulation of metabolic processes (Metabolism).[16]

Mechanism of Action:

According to the classical literature, venesection works on the principles of Tanqiyae Mawad (Evacuation of matter) and Imalae Mavud (Diversion of matter). Tanqiyae Mawad means the excretion of morbid humors and excess fluids from the body through blood, thereby maintaining the homeostasis in the quality and quantity of four bodily humors, which is actually responsible for normal health. It also leads to the diversion of the morbid fluids from the site of affected area to the site where from it is easily expelled from the body tissues. On the basis of these two fundamental principles, Unani physicians have been widely using this therapeutic regimen for a number of diseases.[14]

Indications in Unani Medicine

| S.No | Diseases | Veins |
|------|--------------------------------|---------------------------------|
| 1 | Suda'a (Headache) | Temporal vein |
| 2 | Warne Dimagh (Meningitis) | Temporal vein |
| 3 | Sadr (Vertigo) | Median cubital vein, Behind ear |
| 4 | Shaqeeqa (Migraine) | Temporal vein |
| 5 | Khunaaq (Diphtheria) | Cephalic vein |
| 6 | Ashobe Chashm (Conjunctivitis) | Cephalic vein |

| | | |
|----|---------------------------------|---------------------------------|
| 7 | Rua'af (Epistaxis) | Cephalic vein |
| 8 | Zeequnnafas (Asthma) | Basilic vein |
| 9 | Warme Lissa (Gingivitis) | Cephalic vein |
| 10 | Warmehalq (Pharyngitis) | Cephalic vein |
| 11 | Khafqan (Palpitation) | Basilic vein |
| 12 | Surfa | Cephalic vein |
| 13 | Zaturriya (Pneumonia) | Cephalic and Basilic vein |
| 14 | Shosa | Basilic vein |
| 15 | Nafsud dam (Haemoptysis) | Cephalic and Basilic vein |
| 16 | Warmemeda Har (Acute Gastritis) | Basilic vein |
| 17 | Zibha | Cephalic vein |
| 18 | Warmetihal | Basilic vein |
| 19 | Niqras (Gout) | Basilic vein |
| 20 | Ehtabase tams (Amenorrhoea) | Saphenous vein |
| 21 | Kasrate tams (Menorrhagia) | Median cubital vein |
| 22 | Hummaeruba | Basilic vein |
| 23 | Bawaseer (Piles) | Basilic and Saphenous vein |
| 24 | Wajaulmafasil (Arthritis) | Basilic and Median cubital vein |
| 25 | Juzam (Leprosy) | Haft andam |
| 26 | Sonokhus | Basilic vein |
| 27 | Irqunnisa (Sciatica) | Basilic and Saphenous vein |
| 28 | Wajauzzahar (Low Backache) | Basilic vein ^{2,17,18} |

INDICATIONS IN WESTERN MEDICINE

1. Haemochromatosis

One of the main indications for therapeutic phlebotomy is haemochromatosis. Hereditary haemochromatosis is a multisystem disease that causes excess iron deposition in a variety of organs and tissues, and many patients are asymptomatic or present with signs and symptoms not specific to the disease.

A large survey that included [26] 2,851 patients with haemochromatosis to assess the symptoms and the response to therapeutic phlebotomy found that 86% reported that some or all of their symptoms improved with phlebotomy. Therapeutic phlebotomy is indicated for symptomatic patients to prevent complications or those who have already developed end-organ damage, with a serum ferritin greater than 300 µg/L for men or post-menopausal women and greater than 200 µg/L for pregnant females.

2. Porphyria cutanea tarda

Porphyria cutanea tarda (PCT) [28] is a rare metabolic disorder caused by uroporphyrinogen decarboxylase deficiency that leads to the accumulation of uroporphyrinogen and highly carboxylated

porphyrins in the liver, plasma, urine and sometimes faeces.

According to Rocchi *et al*[25]., 450 mL of whole blood should be removed during each phlebotomy session, with sessions repeated every 2 weeks until the haemoglobin level is below 11 g/ dL or until the serum ferritin level is below 20 ng/ mL, which is close to the lower limit of normal. Most patients require 6 months to achieve remission but clinical improvement may be noted during the third month after starting phlebotomy.

3. Polycythaemia

Polycythaemia or erythrocytosis is a term used to describe an increase in the red blood cell mass. It can be divided into absolute polycythaemia defined as an increase in the number of red blood cells, or relative polycythaemia caused by a decrease in the plasma volume.[27] PV is suspected in any patient with an elevated haemoglobin level (more than 16 g/dL in women or 18 g/dL in men) or haematocrit (more than 47% in women or 52% in men), splenomegaly with or without leucocytosis and thrombocytosis, and in patients presenting with portal venous thrombosis. Several trials have investigated and they all concluded on the importance of

therapeutic phlebotomy. The most important one was the PVSG prospective trial in which 400 patients were randomly assigned to receive either phlebotomy alone or chlorambucil with phlebotomy as needed or radioactive phosphate (^{32}P) with phlebotomy as needed and were then followed for 20 years [32,33]. The authors concluded that phlebotomy provides the best overall survival but at an expense of increased risk of thrombosis during the first 3 years. Phlebotomy is now considered to be the mainstay of PV treatment. There are no true guidelines concerning the optimal haematocrit level in patients with PV. Some studies suggested maintaining haematocrit at a level below 45% to reduce the risk of vascular occlusive episodes[12]

Contraindications:

Children and geriatric people, very lean and thin patient, fatty people, patients with disease of Azae Raeesa (vital organs), patients with Amraze Barida (cold diseases), and having cold temperament, patient with hemiplegia, epilepsy, apoplexy, tuberculosis, extreme cold and hot seasons, during pregnancy and menstruation, just after taking meals, after coitus, indigestion, diarrhea, colitis and chronic fevers, during the days *days of Buhraan*, severe pain, anemia etc.[4,8,19-24.]

Conclusion:

In summary, it can be concluded that venesection has unique features that are easily recognized. It can be used effectively for the management of various disorders specially damvi Amraaz. Therapeutic phlebotomy is an essential part of the treatment of various diseases especially those associated with iron overload. In our opinion, a safe and cost-effective treatment should also be considered for use as adjunctive therapy in the treatment of the other disorders discussed in our review. However authors suggest that it is the need of present era to develop standard operative procedures (SOP'S) and scientific parameters so that the efficacy of venesection can be proved in a rational manner.

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