



Phlebotomy and Health Promotions: A Comparative Mini-Review from the Viewpoint of Traditional Persian Medicine to Western Medicine

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Abstract

Bloodletting has been one of the most challenging methods in Western Medicine; however, recent studies showed significant effects of this method. According to the emphasis of Traditional Persian Medicine (TPM) on the safety and efficacy of bloodletting, this study aimed to investigate the differences and similarities of phlebotomy between the viewpoint of TPM and Western medicine. The literature review showed that the therapeutic indications of phlebotomy are somehow similar in both views. On the other hand, the phlebotomy performance method, cautions, contraindications, and rules of vein selection are some of the TPM's particular ideas. Although some phlebotomy indications from Avicenna's perspective are similar to Western Medicine (such as chronic urticaria, fatty liver, hypertension, etc.), his holistic view of using bloodletting in a specific treatment package, besides lifestyle modification and herbal medication, can be evaluated in future studies.

Keywords: Bloodletting; Fasd; Venesection; Phlebotomy; Persian medicine

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Introduction

Bloodletting (BL) therapy has been used for preventive and curative purposes by removing blood from patients for centuries [1]. Various cultures and traditional medical systems have used BL for thousands of years to treat a wide range of mental and physical disorders; however, since the 19th century, the medical revolution has restricted BL primarily to blood transfusion [2]. Although many studies have reported anemia and infectious disease as side effects of BL, and the death of George Washington has been linked to it, recent studies suggest BL as a treatment for various diseases [3]. BL has potential therapeutic effects in hematologic diseases associated with iron overload, such as polycythemia or hemochromatosis [4-6], as well as certain non-hematologic diseases, including atherosclerosis, insulin resistance, urticaria, carpal tunnel syndrome, androgenic profile, hypertension, and non-alcoholic fatty liver disease (NAFLD) [1, 2, 7-11]. BL regulates serum immune globulin (Ig) E, interferon (INF) γ , and interleukin (IL) 4 [7]. It also affects the homeostatic Model Assessment for Insulin Resistance (HOMA-IR), serum androgens, and serum insulin [8], as well as iron overload, aspartate aminotransferase (AST), alanine aminotransferase (ALT), and C-reactive protein (CRP) [10]. BL has been commonly used as a non-pharmacological treatment by Traditional Persian Medicine (TPM) scholars. Phlebotomy, also known as venesection, and wet cupping are two main branches of BL [12]. Avicenna, as a famous TPM scholar, recommended phlebotomy for many ailments, including arthritis, mental disorders, menstrual problems, etc. [13]. Given the historical basis of phlebotomy in TPM and ongoing debates regarding its safety and efficacy in recent studies, this review aimed to perform a literature review of proven phlebotomy indications in recent studies and compare them with the indications proposed by Avicenna.

Materials and Methods

Relevant studies were obtained from databases, including PubMed, Scopus, EMBASE, Web of Science, and Google Scholar using the keywords 'venesection', 'bloodletting', 'phlebotomy', and 'bleeding therapy'. Systematic reviews, narrative reviews, and clinical trials were investigated. Inclusion criteria consisted of studies reporting clinical effects of phlebotomy in human disease with no restriction on publication date. Papers on 'self-phlebotomy', 'cupping', 'pricking', or 'leech therapy' were excluded. Additionally, the *Phlebotomy* (fasd) chapter from key TPM textbooks such as Canon of Medicine, Zakhireh Kharazmshahi, and Kholasa-al-Hikma was thoroughly evaluated.

Results and Discussion

Evidence in Traditional Persian Medicine

TPM encompasses various BL techniques. One prom-

inent method is "*fasd*", a form of phlebotomy involving vein incision with a surgical blade [12], as detailed in the TPM textbooks [13]. The procedure follows a structured step-by-step protocol [14]: (Step 1) Patient assessment: the physician evaluates the patient's temperament (*mizaj*), age, and disease condition to select the appropriate vein and determine the volume of blood to extract; (Step 2) Preparation: patient must avoid heavy meals and cold-temperament foods (e.g., milk, fish, cucumber, lettuce, kiwi, and tomato). No sexual activity, prolonged bathing, or physical exhaustion is permitted 24 hours prior to the procedure. Phlebotomy is not allowed during hunger, thirst, or menstruation. Optimal time of day is when it is neither too hot nor too cold, for example, midday in winter and morning and evening in summer; (Step 3) Vein selection: Phlebotomy acts as a systemic cleanser that expels waste material of the whole body or specific organs [15]. Phlebotomy can be performed via various veins, and each vein has its specific therapeutic effects, e.g., among cubital fossa veins, the cephalic vein is related to the head problems such as epilepsy or vertigo [16, 17] and basilic vein is related to liver and spleen problems. Veins on the right side of the body are related to right side organs, and left side veins correspond to left side organs [12]; (Step 4) Incision technique: a tourniquet should be applied proximal to the selected vein. After disinfecting the area, a sharp lancet is used for a quick precise cut in the vein. For better vascular repair, longitudinal incisions are preferred, except near joints or other blending places where transverse cut is advised; (Step 5) Bloodletting: the blood is allowed to flow until its color transition from dark to light red (200 mL average volume); and (Step 6) Post-phlebotomy care: the wound is covered by honey and curcumin paste and a light bandage to avoid bleeding. A burnt cotton will be applied if bleeding persists. Patients take rest for a few minutes to avoid syncope and can use apple or honey syrup in case of dizziness [14,15].

Avicenna, author of the famous book "*Canon of Medicine*", stands as one of the most influential scholars in TPM whose work profoundly impacted both contemporary and subsequent generations of physicians [18-20]. Many physicians have followed his point of view in the diagnosis and treatment of disease, and their medical texts are commentaries on his attitudes [21]. Avicenna, like other traditional medical scholars, advocated a hierarchical, holistic treatment strategy for prevention and treatment of the disease encompassing lifestyle modification, herbal medicine, BL, and their combinations, from simple to complex interventions. In other words, according to Avicenna, treatment is a comprehensive package, and phlebotomy is one method along with other methods [22]. So, the physician should start the treatment with simple remedies like

diet modification. Therefore, if it was insufficient, he should go toward herbal medications and BL [23]. In Avicenna's view, blood is the origin of body functions such as tissue respiration, growth, development, management, and distribution of energy, and nourishment of organs; hence, physicians should avoid phlebotomy as much as possible, because blood is a vital substance. Although he claimed that incorrect, excessive, or not indicated phlebotomy imperils critical body functions and may lead to many side effects, he believed that in some diseases, preventive or therapeutic phlebotomy is indicated because it purifies the blood, reduces the pain, and improves the blood circulation [13]. To achieve the best results from phlebotomy, TPM scholars have outlined the cautions, contraindications, patient preparation conditions, hazardous phlebotomy methods, strategies to stop bleeding, methods of decreasing complications and technical errors, and required diets before and after phlebotomy [13]. According to TPM, phlebotomy can play a role in the diagnosis, prevention, and treatment of the disease. General indications of phlebotomy include patients affected or prone to excess blood-related disease, a situation that is caused by an injury such as a blow that caused swelling and blood accumulation on that side, or patients with excessive accumulation of poor-quality humors that have different manifestations in each organ [14]. General contraindications of phlebotomy include cold temperament, too hot or too cold weather, weakness due to severe pain, immediately after swimming, prolonged bath, or sexual activity, when skin rashes are appearing like in chickenpox, age less than 14 years old or weak elders, anemia, too thin or too obese, pregnancy, menstruation, chronic disease

that caused anemia and weakness, very hungry or full, poisoning, toxic bites, drunkenness, gastroenteritis, severe fatigue, and insomnia [15]. Other indications or contraindications depend on the patient's situation and the decision should be made by a TPM specialist. For example, one of the indications of phlebotomy is distracting the attention of the body nature from one organ to another. It means that if there is an excess bleeding in an organ, the physician can reduce the bleeding by phlebotomy a far vein from the bleeding site, e.g., phlebotomy of basilic vein in menorrhagia. Table 1 represents some examples of veins and their indications for phlebotomy according to TPM. It is very important to note that each disease has different etiologies and the TPM specialist knows that phlebotomy is proper for which diseases and etiologies [13].

Evidence in Western Medicine

Contemporary research has investigated the therapeutic potential of phlebotomy across various disease states. Overview of Khatami et al. reported meta-analysis studies of phlebotomy in managing high blood pressure, musculoskeletal disease, and dermatological conditions [24]. Additional studies have documented benefits of phlebotomy in chronic urticaria [19], non-alcoholic fatty liver disease (NAFLD) [20], dyslipidemia [25], insulin poor tolerance [21], porphyria [22], any type of iron overload [5], hypertension [23,26], acne [27], blood loss and the necessity to a blood transfusion during liver resection [28], carpal tunnel syndrome [11], acute gouty arthritis [29], acute ischemic stroke (rapid hemodilution therapy) [30], and chronic low back pain [31]. Hemochromatosis, polycythemia vera, and thalassemia represent classic

Table 1. Possible veins for phlebotomy and their indications according to Traditional Persian Medicine

Location	Vein	Traditional name	Indication
Head and neck	Supratrochlear vein	<i>Varid Jebheh</i>	Feeling a heavy head, chronic headache
	Nasofrontal vein	<i>Varid Magheyn</i>	Headache, conjunctivitis
	External nasal vein	<i>Varid Ernabe</i>	Vitiligo of face, dark skin, and nose itch
	Inferior and superior labial veins	<i>Varid Chahar rag</i>	Mouth problems, aphthous, swelling, or cracking of the lips
Upper limb	Sublingual vein	<i>Varid Tahte-lesan</i>	Stuttering, tonsillitis, mouth problems
	Superficial temporal vein	<i>Varid Yafookh</i>	Migraine, head ulcers
	Posterior auricular vein	<i>Varid Khalfe goosh</i>	Ear problems
	Cephalic vein	<i>Varid Ghifaaal</i>	Clearance of the whole head
	Basilic vein	<i>Varid Baseliq</i>	Clearance of the liver, spleen, and lungs
	Median cubital vein	<i>Varid Ak-hal</i>	General body cleansing
	Dorsal metacarpal vein (left side)	<i>Varid Osaylem</i>	Spleen, heart, lung, and diaphragm problems
	Dorsal metacarpal vein (right side)	<i>(chap) Varid Osaylem (rast)</i>	Liver, lung, and diaphragm problems
Lower limb	Great saphenous vein	<i>Varid Safen</i>	Amenorrhea, hemorrhoids, itchy thighs, or genitalia
	Posterior tibial vein	<i>Varid Khalfe-e-</i>	Achilles tendonitis, sciatica
	Small saphenous vein	<i>Orqoob Varid Erq-al-Nesa</i>	Sciatica
	Popliteal vein	<i>Varid Maabez</i>	Amenorrhea, low back pain

iron overload disorders and impaired iron regulation system, where phlebotomy-based treatment protocols remain a cornerstone therapy [4, 27, 28]. While iron is essential for metabolic processes, oxygen transport, and other vital body functions, its excess induces oxidative stress, elevates free radicals, and accelerates tissue damage [6]. Phlebotomy is a well-known safe non-pharmacological treatment for iron overload-related disease [6]. Relevant papers show that besides hematologic and iron overload-related diseases, phlebotomy affects substantially some non-hematologic diseases, such as chronic urticaria [32]. Recent studies revealed that a reduction in serum iron may have therapeutic potential in the treatment of cardiovascular disease, diabetes progression, and liver dysfunctions [10]. Diabetes, NAFLD, liver fibrosis, insulin resistance, dyslipidemia, cardiac disease, and some other metabolic disorders are the result of oxidative stress, which is increased by iron overload [33, 34]. The study of Sachinidis et al. showed that hyperferritinemia leads to metabolic dysfunctions such as steatohepatitis and fatty liver, hypertension, impaired fasting blood glucose, and dyslipidemia [35]. Accumulation of iron in hepatocytes and Kupffer cells results in metabolic derangements, inflammatory conditions, and impairment of iron regulators such as ferritin [36]. Emerging evidence reveals a bidirectional relationship between iron overload and metabolic dysfunction: iron overload leads to inflammatory conditions and progression of metabolic diseases; likewise, increased adipose tissues, overfat, and other metabolic syndrome risk factors elevate ferritin and hepcidin and result in iron overload by dysregulating iron homeostasis [34]. Hence, phlebotomy

can break this vicious circle by decreasing iron overload. As in diabetes, iron and ferritin overload increase insulin resistance, phlebotomy helps control blood sugar, regulate beta-cell functions, insulin sensitivity, and other components of metabolic syndrome by decreasing the amount of iron and ferritin [35]. Likewise, some studies reported lipid profile adjustment and hypertension regulation as the effects of blood loss [37]. The most critical distinction between historical and contemporary phlebotomy practice is that phlebotomy was just one part of the treatment package in TPM, and its role was beside the lifestyle modification and herbal medication [15]. Additionally, indications of phlebotomy include a large number of diseases in TPM with a narrow range of equivalents in Western Medicine [13]. So, there are remarkable similarities between several indications of phlebotomy from the perspective of Western Medicine and TPM that can be the target of future studies. Table 2 compares the goals of phlebotomy from the perspective of TPM and Western medicine [13].

Due to the lack of enough evidence to support previous phlebotomy indications, it is time to investigate these indications through properly-designed studies. Most recent studies, even those that reviewed the existing literature systematically, found phlebotomy to be a safe procedure [6, 37, 39]. Likewise, TPM set strict contraindications and preparation conditions for phlebotomy that should be considered in the performance of phlebotomy - if not, complications occur. Avicenna indicated that performing phlebotomy using different veins leads to achieving different gains, which requires further evaluations in future studies.

Table 2. Comparison of the phlebotomy indications in recent studies with Avicenna's point of view

Western Medicine	Avicenna's viewpoint
Chronic urticaria [19]	"Shara" (sudden onset of skin eruptions with redness and itching)
Fatty liver [20,38], adjuvant in hepatitis C [21] Dyslipidemia and hypertriglyceridemia [25], insulin poor tolerance [21], Porphyria [22], Iron overload [5]	Liver diseases "Redaat" (Bad quality or quantity of blood ingredients)
Hypertension [23,26] Acne [27]	"Emtela" (pathologic increase of blood volume) Skin eruptions
Decreasing blood loss and the necessity for a blood transfusion during liver resection [28]	"Enheraf-e-tabiat" (distracting nature: decreasing bleeding of a site of the body with minor phlebotomy of the opposite site)
Carpal tunnel syndrome [11], acute gouty arthritis [29] Acute ischemic stroke (rapid hemodilution therapy) [30]	Treatment of joint pain Reducing blood accumulation in the injured organ
Chronic low back pain [31]	Same indication as PM

Conclusion

We can develop phlebotomy practical instructions by considering technical errors, cautions and contraindications, pre- and post-phlebotomy diets, and patient preparation conditions with Avicenna's recommenda-

tions. Although recent studies showing that phlebotomy is effective for chronic urticaria, fatty liver, hepatitis C, dyslipidemia, insulin resistance, porphyria, iron overload, hypertension, acne, and carpal tunnel syndrome, other indications according to TPM need

further investigations.

Conflict of Interests

The authors declare there is no conflict of interest.

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