

Review Article

“Perspective of Ischemic Heart Disease (Iqfari Marad-i-Qalb) with reference to Unani Medicine”

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Abstract:

Background: Ischemic heart disease (IHD) also known as coronary artery disease (CAD) is the leading cause of death worldwide. IHD is caused by obstruction of one or more coronary arteries. Among the various causes of obstruction atherosclerosis is the leading cause. Physical inactivity, smoking, saturated fat rich diet, hypertension, diabetes mellitus, dyslipidaemia are modifiable risk factors for atherosclerosis which ultimately results in IHD. In this article we will discuss the disease in the light of Unani system of Medicine and how to manage it depending on the understood concepts **Methods:** A number of classical Unani textbooks were referred for description of various heart diseases and various search engines such as PubMed, Google Scholar and Research Gate were cited for recent advancements using the key words IHD, atherosclerosis, cardio-protective herbal drugs, etc. **Conclusion:** Owing to the irreversible damage due to IHD it is better to prevent myocardium damage by minimising the risk factors at its earliest. In Unani system of medicine many cardio-protective drugs have been described which when combined with lifestyle modification can play vital role in keeping cardiac diseases at bay.

Keywords: Atherosclerosis; Cardio-protective; Ischemic Heart Disease; Unani medicine

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Introduction:

IHD can be defined as a condition where there is an imbalance between myocardial oxygen supply and demand or insufficient blood supply or oxygen transport to a portion of heart muscle¹. It is the leading cause of death worldwide. IHD affects about 126 million people worldwide, 1.72% of the population². In the year 2017, 1.54 million deaths in India alone, were attributed to IHD³. The risk for various heart diseases has increased as a result of modern lifestyle factors and a number of illnesses, including diabetes

mellitus, hypertension, and dyslipidaemia. By 2030, the prevalence rate of IHD, which is currently 1,655 per 100,000 people, is predicted to increase to 1,845 per 100,000 people². The most frequent cause of IHD is atherosclerotic plaque-induced obstruction, or stenosis of one or more epicardial coronary arteries¹. Stable angina develops when the obstruction is fixed and there is transient ischemia. Acute coronary syndrome manifests as the plaque erodes or ruptures, causing thrombus formation that obstructs the vessel. If there is no evidence of myocytic necrosis

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it is Unstable Angina. When myocytic necrosis is evident and occlusion is partial it is Non-ST segment elevation Myocardial Infarction (NSTEMI); whereas, ST-segment elevation myocardial infarction (STEMI) occurs when the occlusion is abrupt and complete. Other non-atherosclerotic causes include coronary spasm, arterial thrombi, emboli, arteritis, dissection, myocardial bridging, hypertrophic or dilated cardiomyopathy, tachycardia and also some non-cardiac causes such as anemia, sickle cell disease, hypoxemia, carbon monoxide poisoning, hyper viscosity, hyperthyroidism, pheochromocytoma^{1,4}. IHD can be diagnosed on the basis of its clinical features and some invasive and non-invasive techniques. For confirmatory diagnosis exercise ECG is the first line investigation for stable angina, if it is normal or inconclusive stress echocardiography or myocardial perfusion scanning is indicated⁵. Sequential measurements of cardiac biomarkers are found to be normal in unstable angina and increased in MI. Echocardiography is performed to evaluate ventricular function and to find additional complications^{1,5}. When bypass graft surgery or percutaneous coronary intervention is being considered for revascularization, coronary angiography is advised⁵. Among the various pharmacological and symptomatic treatment of ischemia and angina aspirin, ACE inhibitors, and lipid-lowering agents have been proven to lower morbidity and mortality in patients with stable coronary heart disease (CHD) and preserved LV function, whereas beta blockers have been found to reduce mortality in patients who have previously experienced a MI. Other therapies, such as nitrates, beta-blockers, calcium channel blockers, and ranolazine, are not found to reduce mortality in patients with stable IHD but can improve angina and exercise performance, as well as reduce ischemia⁶. A new bundle branch block or characteristic ST segment elevation in two adjacent leads on the ECG are indications for immediate PCI (percutaneous coronary intervention)⁵, and coronary artery bypass graft (CABG) is considered in more complicated conditions like left main or triple-vessel disease, diffuse coronary stenosis, completely obstructed vessels, abnormal left ventricular function, and diabetes¹. In this article, IHD will be discussed in context of the Unani system of medicine, as well as how to manage it based on the concepts that have been understood.

Material and methods

For the search of the Unani literature, authentic books

such as Paradise of Wisdom (Firdaws al-Hikmat fi'l-Tibb), The Complete Book of the Medical Art (Kamil al-Sana), Canon of medicine (Al-Qanun Fi'l Tibb), Zakhira Khawarizm Shahi, Continens Liber (Kitab al-Hawi fi'l Tibb), Kitabul Mukhtarat Fi Tib, Kitab al-Mansuri, Iksir-i-A'zam, Tibb-i-Akbar, Ghina Muna, Risala-e-Adwia Qalbia etc were referred. Further, browsing of PubMed, Google Scholar, Research Gate, AYUSH Portal, Springer, Science Direct, Scopus and other websites was carried to collect the recent advancements related to the topic using the key words IHD, atherosclerosis, cardio-protective herbal drugs, etc.

Unani Perspective

According to the standard medical terminology of Unani medicine Ischemic Heart Disease is termed as *Iqfari Marad-i-Qalb* with code UMA- 0354⁷. However, no direct description is found in the classical literatures for it, but can be well understood and managed on the basis of the studied pathology for the disease. According to classical texts available, a number of pathologies of heart have been considered to be responsible for all heart diseases, such as 1) *Sue Mizaj mufrad* or *murakkab* (alteration in the normal temperament of heart towards either heat or cold and moisture or dryness alone or in combination) which may be of *sada* or *maddi* i.e. it may or may not involve *akhlat* (humours) 2) *Waram* (Inflammation) 3) *Tafarruq ittisal* (discontinuity / anatomical disruption) 4) *Sue mizaj shirki* (alteration in temperament associated with involvement of nearby organs)⁸ 5) *Sudad* (obstruction) in the heart vessels and also 6) *Amraz-e-waza-e Qalb* (abnormal placement of heart)⁹. In *Kitab Al-Hawi, Dard-e- Qalb* (Chest Pain /Angina) is mentioned as pain in heart arises from left ventricle¹⁰ and it is multifactorial such as 1) *Ghashi* (Syncope), 2) the pain may be in association with diseased condition of various organs like *Tahlil-e-quwwat meda* (dissolution of faculty), *Ikhtanaq-e-dimagh* (cerebral hypoxia) and *Qulanj* (biliary colic), 3) *Munqabiz quwa haywaniyya* (intense grief causes vital powers to gets buried inside the body), 4) *Tehleel ruh* (dissolution of pneuma) due to extreme joy), 5) *Sue Mizaj Qalb* (alteration in the temperament of heart) 6) *Marz murakkab*/compound disease i.e. *warm* (inflammation), *tafarruq ittisal* (damage to heart structures).^{10,11} Out of these etiopathologies *waram* and *tafarruq ittisal* are considered as highly fatal conditions and hardly give heart enough time to present with symptoms⁹ and thus can be understood as pathology behind sudden cardiac death. It is said

that heart cannot tolerate any of the mentioned pathological conditions except for *sue mizaj*¹⁰. This *sue mizaj* can be *sue mizaj sada* (without humoral involvement) or *sue mizaj maddi* (with humoral involvement). According to the doctrine of Unani medicine the *mizaj* (temperament) of heart is *haar* (hot)⁹. In the state of *sue mizaj har* the *mizaj* of the heart gets inclined towards *hararat* (heat) beyond the normal limits and thus develops symptoms. If the alteration in temperament is *ghair mustahkam* (unstable) it presents with *nabz azeem* (high volume pulse), *sari* (rapid), and *mutawatar* (frequent). Temperature of the chest rises locally with *humma lazma* (continuous fever) and intense thirst which is relieved with cool air. Patient is dominated by feeling of *gham*, *bechaini*, *iltihab* and *zuban* (sadness, anxiety, agitation, washed out). When the *sue mizaj har* gets *mustahkam* (established), it presents with *khafqan* (Palpitation) and *ghashi* (Syncope). These symptoms are consistent with that of IHD. *Sue mizaj barid* (alteration of temperament of Heart towards cold) has contrasting features to that of *sue mizaj har*. Here pulse and respiration becomes *sagheer* (shallow), *bati* (slow), *mutafawit* (infrequent) while in *saqoot quwwat* (shock) it is frequent (*mutawatar*). Patient becomes lethargic, pale; body turns like that of elderly persons and symptoms get relieved on exposure to hot environment and fragrances. This presentation inclines more towards cardiogenic shock which is a sequel of IHD. *Sue-mizaj yabis* (alteration of temperament of Heart towards dryness) and *sue-mizaj ratab* (alteration of temperament of Heart towards moisture) have much deleterious effect and are extremely fatal¹¹. The causative factors for *sue mizaj har qalb* are psychological factors such as anger and anxiety, difficult breathing, obstruction of channels for movement of fresh air (Oxygenated blood/Oxygen), *hammam garam* (Hot Turkish bath) or exposure to hot air for prolonged period, consumption of *garam ghizayen* and *mashroob* (food and drinks having hot temperament), inhalation of hot fragrances⁸. Among all these causative factors obstruction of channels is also the leading cause of IHD according to modern concept. Obstruction of vessels may be due to either *tangi-e-majari* (constriction/stenosis of vessels) or *sudad-e-majari* (Blockage of vessels). *Tangi-e-majari* occurs due to increase in *quwwat-e-masika* (retentive faculty), decrease in *quwwat-e-dafia* (expulsive faculty), excessive *burudat/qabz/yaboosat* (coldness/astringency/Dryness), there may be compression from adjacent structures, disfigurement of normal

vasculature, *waram* (inflammation), sticking of inner layer of vessels after wound healing (fibrosis)¹¹. *Sudad* can be due to presence of *shae ghareeb* (foreign substance) within the vessel which may be in abnormal quantity or quality i.e., *ghaleez and lazaj* (thick and viscous)⁹. There may be various causes for development of *sudad* like *suql ghaleez and kaseer* (retention of thick and copious substance), Stone, *qarah and jarah*, (injury to vessel walls after erosion or lesion), new growth within the walls of the vessels (*saleel, masse, laham sulooli*), inflammation in adjacent structures, after using astringent medicines, increase in *quwwate masika*, extreme cold and thus high incidence during winter season⁸, coagulated blood as a result of turbulence to blood flow⁹.

Unani Pathophysiology

Madda (potential matter) when present in large quantity or have excessive cohesiveness, block the coronary arteries⁹. This *sudad* (obstruction to the coronary arteries) restricts the movement of fresh air to the heart while also preventing hot and harmful air from exiting the heart, resulting in *sue-mizaj har*. The *Ruh* (Pneuma) becomes trapped within the vessels and declines[8] eradicating *hararat-e-ghariziya* (innate heat). As a result, heart is unable to perform its function of contraction and relaxation¹⁰.

Ethical Clearance: Not Applicable

Treatment

In Unani system of medicine IHD is managed according to the underlying pathophysiology. First, *sudad* is resolved followed by correction of temperament of heart. *Sudad* is difficult to treat when in blood vessels, especially arteries and arteries of *Azae Raeesa* (Vital organs of body i.e. Heart, Brain and Liver). If the cause is *ghaleez khilt* (thick matter), it is treated with *mulattif and muhallil* drugs and regimens (demulcents and resolvents). However, care should be taken while choosing *adviya-e-mohalila*, as if it is less potent the *madda* will not get resolve completely, instead it will become active and may dislodge thereby increasing the size of *sudad*. This can be understood as thrombo-embolism. Moreover, if the *muhallil* is potent enough *lateef ajza* (light matters) get resolved but *kaseef ajza* (heavy matters) become stiff and it becomes necessary to add *murkhi* (*gile makhtoom*/yellow chalk, *ambar/ambergris*, *Pista/Pistacia vera*) and *mulayyin* drugs (*halela kabuli/Terminali chebula*, *ward/Rosa damascena*)^{12,13,14} (relaxant and laxative). When the *sudad* is because of *khilt lazij* (sticky matter) in that case such medicines

are used which can penetrate in between the sticky matter and inner layer of the vessel wall and detach it from there and make it easy to remove such as *sikanjabeen* (a compound of honey and vinegar)¹¹. When the cause is *khilt kaseer* (excessive collection of matter) then *istifragh* (evacuation) is done by means of *fasd* and *ishal* (venesection and purgation)⁹. The basic treatment for *sudad*, which is when present in arteries of heart are drugs having properties of 1) *Mufattih* (Vasodilator) like *Faranjmushk/Ocimum gratissimum*, *Bahman/Centaurea behen*^{12,13,14} 2) *Muhallil* (*Amla/Emblica officinalis*, *Zafran/Crocus sativus*), 3) *Mulattif* (*Abresham/Bombyx mori*, *Zarnab/Taxus baccata*, *Zaranbad/Curcuma Zedoaria*), 4) *Qabiz* (Astringent) like *Amla*, *Aas/Myrtus communis*, *Sumbul/Nardostachys jatamansi*, *Saad/Cyperus rotundus*, *Sazaj/Cinnamomum tamala*, *Badi elaiichi/Amomum subulatum*, 5) *Khushboodar* (Fragrant) *Badaranjboya/Melissa officinalis*, *Daarchini/Cinnamomum zeylanicum*, *Kafoor/Cinnamomum camphor*, *Kishneez/Coriandrum sativum* and 6) *Muhafiz-e-qalb* (Cardioprotective). For e.g. *Arq Kasni* is *mufattih* and *qabiz*¹¹ as well some other cardioprotective and fragrant drugs are *Mushk/Moschus moschiferus*, *Zafran*, *Zarnab*, *Darchini*, *Ood/Paeonia officinalis*, *Ambar*, *Abresham*, *Post turanj/Citrus medica* outer coat, *Badranjboya*, *Sumbul*, *Sazaj*, *Faranjmushk*, *Gaozaban/Borago officinalis*, etc. Further correction of temperament of heart is done. Firstly *madda-e-ghalib* (dominant humour) is stabilized. If it is *dam* (Blood), *fasd* is done while *saфра* (Yellow Bile) is stabilized by *istifragh safra*. Next temperature is brought down by various ways as follows: inhalation of cool fragrances like *Bed mushk/Salix caprea*, *Gile Armani/Armenian Bole*, *Sandal/Santalum album*, *Kafoor*, *Arq-e-gulab/Rose water*, *Neelofar/Nymphaea alba*, *Sirka/Vinegar* and also keeping the surrounding cool, use of vegetables of cold temperament such as *Khas/Andropogon muricatus*, *Kasni/Cichorium intybus*, *Khurfa/Portulaca oleraceae*, *Kadu/Cucurbita Pepo*. *Sharbat Sandal* and *Qurs Kafoor* are recommended to be taken orally while *Sandal*, *kafoor* and *Arq-e-gulab* can be applied over the chest to bring down the temperature locally¹¹. According to Ibn-e-Sina in order to correct the hot temperament of heart apart from using cold items *muqawwi ruh* (tonic for pneuma) medications should also be used such as *Gaozaban*. *Tabasheer* (*Bambusa arundinaceae*) is described as *muqawwi-e-qalb* (cardiotonic) specifically when there is *Sue-Mizaj Har*. Some other drugs are also suggested to be used in case of *Sue-Mizaj Har Qalb* such as *Tukhm*

Kahu muqasshir/Lactuca sativa, *Tukhm Kasni*, *Tabasheer*, *Gul-e-Surkh*, *Sandal Safaid*, *Tukhm Khurfa Siyah*, *Gaozaban*, *Kishneez Khushk*, *Busd/Corallium rubrum*, *Marwareed/Mytilus margaritiferus*¹⁵.

The renowned Unani physician *Ibn-e-Sina* has mentioned 63 drugs of plant, mineral and animal origin as *Adwia-e-qalbia* for their efficiency in cardiovascular diseases. Various preclinical and clinical studies have been conducted to explore the cardioprotective properties of some of these drugs. *Abresham* (*Bombyx mori*) and its formulations (*Khamira Abresham Hakeem Arshadwala* and *Khamira Abresham sada*) have antioxidant and free radical scavenging effects^{16,17}. Additionally, the amino acids histidine, tryptophan, and cysteine as well as the active ingredient sericin improve dyslipidaemia. It not only delays the onset of atherosclerosis but also aids in reducing the size of plaques¹⁸⁻²⁰. *Badranjboya* (*Melissa officinalis*) has been shown to have mild antiarrhythmic properties by slowing down atrioventricular conduction²¹, altered ECG by prolonging QRS, QTc, TpTe and JT intervals²² and also acts as vasorelaxant²³. Alkaloids like saponins and glycosides decreases heart rate²⁴. Flavonoids, phenolic acids, terpenes, rosmarinic acid and caffeic acids impart antioxidant property to it. It brings about a sharp decline in MDA (malondialdehyde), lowers MAP (mean arterial blood pressure), and maintains cardiac contractility²⁵. It reduces the risk of development of heart diseases by improving lipid ratios HDL, TGs, hs-CRP. *Gaozaban* (*Borago Officinalis*) have a vasodilatory effect on the aorta, suppresses atrial force and rate of contractions²⁶. It has also shown to have a positive inotropic effect on the frog's heart²⁷. *Amla* (*Emblica officinalis*) can reverse atheromatous plaque and improve dyslipidaemia by virtue of its antioxidant property and ability to lower LDL level and prevent LDL oxidation²⁸. Its ability to significantly increase the activities of myocardial SOD (Superoxide dismutase), CAT (Catalase), GPx (Glutathione peroxidase), and GSH (glutathione) along with GSH (glutathione) imparts it its primary cardioprotective effect²⁹. Clinical studies have shown a decrease in arteriosclerosis and an increase in subendocardial viability ratio (SEVR)³⁰. Additionally, It can also restore SAP (Systolic arterial pressure), DAP (Diastolic arterial blood pressure), MAP (Mean arterial blood pressure) and HR (Heart rate) which may drop during myocardial damage. Moreover, it has shown reduction in inflammation, myonecrosis, and also decreases connective tissue myocardial fibres²⁹.

Arjun (*Terminalia Arjuna*) contains flavonoids which have antioxidant, anti-inflammatory, lipid lowering effect by reducing LDL levels³¹, while glycosides have a cardiotoxic effect. Significant inotropic³² and hypotensive effects can be seen in its bark. It also increases coronary artery blood flow and protects myocardium against ischemic damage. It also has a mild diuretic and antithrombotic effect. It increases prostaglandin E2, reduce left ventricular mass, and increase left ventricular ejection fraction³¹⁻³³. It may also prevent myocardial alterations brought on by chronic beta-adrenoceptor stimulation³¹. By reducing the levels of free radicals it shows its anti-apoptotic properties such as ROS (Reactive Oxygen Species), hydroperoxide, and nitrite, as well as the rate of lipid peroxidation. It also increased antioxidant enzymes (superoxide dismutase, glutathione reductase, catalase, and glutathione peroxidase) and total glutathione levels³⁴. It exhibits its anti-atherogenic properties by increasing adiponectin while lowering pro-inflammatory adipokines and leptin levels³⁵. The cardioprotective effect of *Zafran* (*Crocus sativus*) is achieved through its antioxidant³⁶, anti-inflammatory, and anti-apoptotic mechanisms³⁷. One of its active constituents crocin, decreases Ventricular ectopic beats (VEBs), Ventricular tachycardia (VT) episodes and Ventricular Fibrillation (VF)³⁸. Safranal, another active constituent has the ability to normalise the activities of enzymes LDH and CK-MB, reduce lipid peroxidation and MDA levels of heart tissue³⁹. It can also significantly reduce peak MAP, SBP, and HR³⁷. Honey promotes cardio-protection by scavenging radical species, reducing lipid peroxidation, fortifying enzymatic and non-enzymatic antioxidant systems and stimulating/inhibiting pro-inflammatory markers by virtue of its various constituents^{40,41}. Apart from improving lipid profile by lowering total cholesterol, triglycerides, LDL, lipid peroxidation (LPO) and increasing HDL level, honey has also shown to reduce cardiac troponin I level as well as the activities of CK-MB, LDH, AST, ALT. It also reduces the inflammatory cells infiltration, protects cardiac muscle fibre and also enhances the structural and functional integrity of contractile apparatus⁴².

Sumbul teeb (*Nardostachys jatamansi*) demonstrates its cardio-protective activity by its antioxidant and hypolipidemic activity. It also decreases the release of CK into the plasma⁴³. It is also found to decrease LDH, CPK, AST, ALT and MDA levels⁴⁴.

Conclusion:

As per the popular phrase “Time is Muscle” it can be understood how important it is to timely identify the risk for cardiac muscles. Once cardiac muscles start getting compromised and if not managed at right time it may lead to irreversible damage. Looking back into the history, people benefited with the use of herbal medicines for various diseases including cardiac ailments. Nowadays, medical field is again paying attention towards herbal treatment for effective management of diseases and also to avoid various untoward effects of long term use of synthetic products. One can explore the potential herbs used in Unani Medicine for cardiac disease such as *Abresham*, *Gaozaban*, *Badranjboya*, *Amla*, *Arjun* etc as several pre-clinical and clinical trials endorsed their effectiveness, further, trials are undergoing to understand the mechanism of action on their effectiveness.

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