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An overview of cardio protective drugs in the light of *Advia-e-Qalbia*

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Abstract

Cardiovascular diseases are common in affluent class of society of the world, one of the important causes of premature deaths. It may be due to atherosclerosis, hypertension, hyperlipidaemia etc. The major culprit of ischemic heart diseases is atherosclerosis-basically atherosclerosis is nothing but the deposition of cholesterol in the internal layer of arteries. This atherosclerosis can be prevented by modification of diet and use of some cardio protective drugs. Nowadays researchers are concentrating on the preventive aspect of the disease. In ancient classical literature there are several drugs which are mentioned as cardio protective. Ibn-e-Sena was the first among the unani physicians who wrote a book on cardiac drugs by the name of *Advia-e-Qalbia*. In this book he mentioned about the causes, clinical features as well as treatment of several cardiac ailments. Some of the important drugs are *amla*, *zafran*, *sandal*, *balcharh*, *Jadwar* etc. These drugs possess different cardio protective properties. In the paper an attempt has been made to present review of cardio protective drugs in the light of Unani System of Medicine with modern scientific interpretations.

Keywords: Cardio protective, Advia-e-Qalbia, Ibn-e-Sena, hyperlipidemia

Introduction

Cardiovascular diseases comprise the most prevalent serious disorders in the developed nation. The American heart association has reported that in 2002, 62 million Americans (32 million female and 30 million males) had a cardiovascular disease (including hypertension). The prevalence rises progressively with the age from 5% at the age of 20 years to 75% at the age of 75 years^[1].

It is a need of time to introduce safe and potent cardio protective drugs. In *Unani System of Medicine* the concept of cardio protective drugs is very ancient. Even 1st book on cardiac drugs was written by an eminent unani physician known as *Ibn-e-Sena* (980-1037) and mentioned the name of his book as *Advia-e-Qalbia*. He had mentioned a lot of drugs in his book which has different types of actions on cardiovascular system as *Muqavvi-e-Qalb*, *Muharrrik-e-Qalb*, *Musakkin-e-Qalb*, *Mufarreh-e-Qalb*, *Mufatteh-e-Urooque*, *Mudir*, anti hypertensive, hypolipidaemic etc^[2].

In modern time, heart diseases and mental ailments are particularly counted among the diseases which become common and which are as very hazardous for human life. The medical science is devoting its best research brains to find out the treatment and cure. *Ibn-e-Sena* has the honour and distinction to be the first to comprehend the necessity of exclusively working on the medicines for heart ailments more than one thousand years ago when heart diseases were not common and their occurrence was probably quite rare^[2].

Several animal and clinical trials have been done on some potent cardiac drugs and it is found that these drugs have potent cardio protective actions. There are 63 single drugs which are mentioned in the book – *Advia-e-Qalbia*.

Cardio protective Glycosides A considerable number of plants scattered throughout the plant kingdom contain C23 and C24 steroidal glycosides, which exert a slowing and strengthening effect on failing heart. In western medicine it is the glycosides of various *Digitalis* species that are extensively employed. The pharmacological effectiveness of the cardio active glycosides is dependent on both the aglycones and the sugar attachment; the inherent activity resides in the aglycones, but the sugar render the compound more soluble and increases the power of fixation of the glycosides to the heart muscles^[3].

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Activities of Herbal Drugs on the Heart

Anti Arrhythmic Drugs: As mentioned above, the cardiac glycosides can be used to control the supraventricular arrhythmias. There are a number of drugs which have the property to control arrhythmia as *Balchar* [4].

Anti Hypertensive Drugs

The control of hypertension is an important element in the management of cardiovascular disorders. *Rauwolfia* and its principle alkaloid reserpine together with veratrum extracts were recognized in allopathic medicine in the early 1950s as the hypotensive plant drugs [3].

In Unani system of medicine *Kishneez* (coriandrum) is being used as hypotensive agent since very long time and the drug is also included in *Advia-e-Qalbia* [2].

Platelet Activating Factor Antagonists

In the circulatory system thrombi may be caused on the arterial side as a result of the adhesion of blood platelet to one another and to the wall of the vessels. This platelet aggregation is triggered by the platelet activating factor, which is released from the activated basophiles. A large number of plants have been screened for anti PAF activity. The active constituents, which help in preventing the aggregation of platelet, are lignans, sesquiterpenes, coumarins, pyrocaterol, and salicyl alcohol. There are many drugs in *Advia-e-Qalbia* which have sesquiterpens and coumarins as *sandal*, *balchar*, *turanj*, etc.

Drugs Acting on Blood Vessels

These drugs are either vasoconstrictor or vasodilator but their action may originate in a variety of ways.

Oral Anticoagulants

These drugs inhibit the clotting mechanism of the blood and of value in arterial thrombosis. One group of active drugs constitutes the 4-Hydroxy Coumarins which act by antagonizing the effect of vitamin K. It is mentioned that the species of *lavendula* has this property. There are many *Advia-e-Qalbia* which have coumarins e.g. *turanj*.

Hypolipidaemic Drugs: In recent years much prominence has been given to the association of high level of blood cholesterol and plasma triglycerides with atherosclerosis and ischaemic heart disease. *Lehsun* has been proved as a potent hypolipidaemic drug.

Some Potent Cardio protective Drugs

There are 63 single drugs mentioned in the book *Advia-e-Qalbia*, out of them the description of some important drugs is as follows:

1. Amla- (*Emblica officinalis*): *Amla* is a highly nutritious and an important source of vitamin C, minerals and amino acids.

Chemical constituents

It contains glutamic acid, praline, aspartic acid, aniline, lysine, gallic acid, tannin, sugar and minerals. Active constituents of *amla* – emblicanin A&B, puniglucanin, 2-Ketogluconalactone which is equivalent to vitamin C, ellagic acid, trigalloyl glucose [5].

Medicinal uses

It can be used as astringent, cooling agent, diuretic, laxative, digestive and anti inflammatory. On the basis of its diuretic property it can be used in congestive heart failure [4]. It also acts as antioxidant due to gallic acid [6]. Aqueous extract of *Amla* increases cardiac glycogen level and decreases serum GOT, GPT and LDH in rats having induced myocardial necrosis. It can be used as a cardio tonic [7].

2. *Jadwar* – (*Delphinium denudatum* Wall.)

The generic name of *Jadwar* is derived from a Greek word, which means Dolphin, as the nectar resembles the figure of a dolphin [8]. The word *Jadwar* is Arabic form of Persian *Zadwar*, which means the great purifier or antidote [9]. In India, *Jadwar* was named as *Narbasi* / *Nirbisi* due to its antidotal properties [10].

Chemical Constituents

Presence of alkaloids like delpho-curarine, staphisagrine, delphinine, condelphine, isotalatizidine, denudatine, panicutine, 3-hydroxy-2-methyle-4H-pyran-4-one, diterpinoid alkaloid 8, acetylhetero-phyllisine and diterpinoid alkaloid C₂₅H₃₉NO₆ identical with condelphine, have been reported [11, 12, 13, 21]. Sterol and fatty acids have been detected in *Jadwar* roots [22]. The gas liquid chromatography (GLC) analysis showed that saturated and unsaturated fatty acids were in a ratio of 1:3. [23] Sugar, protein, phenol, starch, iron, zink, calcium, magnesium and potassium are also present in *Jadwar* root [24].

Medicinal Uses

In classical books of *Unani* Medicine, *Jadwar* is referred as antipyretic, antiseptic, detergent, diuretic, exhilarant, resolvent, antiinflammatory, demuscent, dedative, analgesic, aphrodisiac, antidote, cardiotoxic, general tonic, brain and nervine tonic. *Jadwar* has been recommended for the treatment of paralysis, epilepsy, facial palsy, insanity, mania, hysteria, atony, migraine, numbness, tremors, infantile convulsions, aconite poisoning, snake bite, opium addiction, arthritis, cardiac weakness, palpitation and rheumatic heart disease [25, 42].

3. *Lehsun* – (*Allium sativum* Linn.)

Garlic (*Allium sativum* Linn) is a common herb which is used in culinary preparation since the time immemorial. If folk wisdom is not ignored, it may teach us valuable lessons. Some of the earliest references to this medicinal and culinary plant are found on Sumerian clay tablets dating from 2600–2100 BC [43, 44]. In these writings garlic was already widely cultivated; therefore its use must precede this.

Chemical constituents

Presence of the diallyl, allyl methyl and dimethyl mono to hexa sulfides is reported. It also contains allicin, alliin, 1-propenyl allyl thiosulfonate and γ -L-glutamyl-S-alkyl-L-cysteine. [43]

Medicinal uses

According to various studies, Garlic have various cardio protective activities as anti atherosclerotic [45], fibrinolytic [46, 47], antiplatelet aggregation [48, 49], anti hypertensive [50, 52], anti arrhythmic [53, 54] and antioxidant [55, 56] etc. It reduces the aortic stiffness and so reduces the cardiovascular

morbidity and mortality [57]. It is also used for the relaxation of heart muscles [58].

3. Zafran – (*Crocus sativus*): Chemical constituents
Saffron contains red coloring matter known as crocin and crocetin, bitter principle picrocrocin and traces of volatile oil. Procrocetin is a carotenoid glycoside [4, 5].

Medicinal uses

Plants have been awarded to crocetin, the most active component in saffron, for the treatment high blood pressure in cats.⁵⁹Some scientists suggest that the incidence of cardiovascular disease in parts of Spain is low because the locals consume so much saffron [60]. Interestingly, significant reduction of cholesterol was noted in a number of studies that involved injecting animals with saffron [61]. Saffron may reduce the risk of heart disease in another way as well: by increasing the oxygen supply to the blood stream. Research indicates that extra oxygen in the blood stream may help prevent situation in which vessels wall are hungry for oxygen and artery clogging plaque begins to deposit along crucial vessels feeding the heart, causing the atherosclerosis.⁶² In *Unani System of Medicine* the drug is used as an exhilarant, helps absorption of cardiotonics and strengthens internal organs of the body [63].

4. Kishneez – (*Coriandrum sativus*): Chemical constituents

Coriander yields from. 3 to 1% of volatile oil. The fixed oil (13%) and protein (20%) are the other contents of the drug. Volatile oil of the drug contains 90% of D-linalool (coriandrol) and coriandryl acetate, and small quantities of L-borneol, geraniol and pinene. Coriander leaves are rich in vitamin A content. The fruit yields 5-7% ash [4].

Medicinal uses

Advanced research in small animals such as dogs includes that coriander have blood pressure reducing properties [64]. A study of the dried seeds in humans indicated a diuretic effect [65].

5. Sandal Safaid – (*Santalum album*): Chemical constituents

Oil of sandal contains about 95% of the isometric sesquiterpine alcohol, α -Santalol and β -Santalol. Additionally, the oil contains an aldehyde santalal, santene, santenone, teresantol and santalene [4].

Medicinal uses

Due to the presence of sesquiterpine it can be used as an antagonist of platelet activating factor, thus prevents the thrombi formation [3].

6. Balchar – (*Valerian jatamansi*): Chemical constituents
Valerian contains pale brown to amber colored oil about 1% and alkaloids chatenine and valerine. Volatile oil contains borneol formate, borneol acetate, camphene, borneol, isovalerianate, sesquiterpine. It also contains valepatriates or valtrate- responsible for the therapeutic activities [4].

Medicinal uses

Valerian roots have antispasmodic and depressant action on the central nervous system. It can be used as stimulate and carminative [4]. Jatamansi can be used as sedative, diuretic,

emmenagogue and stomachic. It is stimulant in small doses and also useful in epilepsy, hysteria and palpitation of heart. The oil possesses anti arrhythmic and hair growth activities [5]. Animal studies indicate that the herb reduces blood pressure and may have anti convulsant properties [61].

Conclusion

There are a number of other drugs which are in use since a long time as cardio-tonic and cardio-protective. Now, there is a need to evaluate the efficacy of cardio-tonic and cardio-protective drugs on scientific parameters. Indeed, there is a need to introduce such quick acting cardio protective drugs in unani system of medicine, which can counter the emergency condition in respect to cardiac diseases. So aim of this paper to make an attempt in introducing potent cardio-tonic and cardio-protective drugs in *Unani System of Medicine*.

Conflict of interest: Nil

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