JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue

JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)

An International Scholarly Open Access, Peer-reviewed, Refereed Journal

A LITERARY STUDY ON ANALYTICAL STUDY OF MUSTAK AS THE SUBSTITUTE OF ATIVISHA

Dr. Rajiv Bansal [1], Dr. Satender Khatri[2], Dr. Bhavna Singh[3], Dr. Sahana V.M. Vats[4], Dr. Vimla Bisnoi[5]

1. PG Scholar, Department of *Dravyaguna*, Uttaranchal Ayurvedic College, Uttarakhand
2. PG Scholar, Department of *Dravyaguna*, Uttaranchal Ayurvedic College, Uttarakhand
3. Professor, HOD & Guide, Department of *Dravyaguna*, Uttaranchal Ayurvedic College, Uttarakhand
4. Asso. Professor & Co-Guide, Department of *Dravyaguna*, Uttaranchal Ayurvedic College, Uttarakhand
5. Assist. Professor & Co-Guide, Department of *Dravyaguna*, Uttaranchal Ayurvedic College, Uttarakhand

***Corresponding Author:** Dr. Rajiv Bansal PG Scholar, Department of *Dravyaguna*, Uttaranchal Ayurvedic College, Uttarakhand

ABSTRACT-

Acharya Charak has classified the various medicinal plants in a combination of ten drugs into Fifty different combinations which are mentioned as Mahakashayas on the basis of their actions. Cardiovascular disease (CVD) is the leading global cause of death, accounting for 17.3 million deaths per year, a number that is expected to grow to more than 23.6 million by 2030[1]. The present study for the purpose of dissertation was aimed for, to collect and authenticate the sample of each drug mentioned in Hrudaya Mahakashaya of Charak Samhita from any AYUSH Certified laboratory along with review the classical text books of *Ayurveda* and recent literature regarding Hridya Mahakashaya of Charak Samhita and to carry out the Pharmacognostical Analytical Study of Hridya Mahakashaya of Charak Samhita to find out the relation in reference to Cardioprotective activities.

All Hrudaya Mahakashaya Dravyas are Amla Rasa Pradhana and possess Ushna- Snighda Guna and Vata-Kapha Hara property except for Amra which is Kapha Vardhaka. Hrudaya is the seat of Buddhi and Chetana as it controls Shareera, Manas and Indriyas. Thus, Hrudaya is considered as a psycho-somatic entity, if afflicted all the Prakruta Shareerika and Manasika functions are hampered leading to the manifestation of Hrudrogas. All Hrudya Mahakashaya Dravyas are Amla Rasa Pradhana. The Guna Dharma of Hrudya Mahakashaya can be implicated to be the same as that of Amla Rasa. Since Hrudya Karma has been elucidated

in relation to its Rasa.

Keywords- Mahakshaya, Hridya, CVD, Amla etc.

INTRODUCTION

Quality life support to ailing beings is foremost to human duties and was considered supreme since time immemorial. Ayurveda, the ancient Indian system of medicine, had traditionally extended life quality management considering the individual's physical, mental and social components of life. Concepts of holistic approach of Ayurveda are now only partially being realized as a superior tool in disease management.

Complexities of holistic Ayurvedic approach can only be understood through a coordinated multi-pronged modem approach for a clearer insight, that require simultaneous efficacy validation leading often, to a rich dividend in management of difficult ailment conditions.

Charka Samhita a distinguished Ayurveda Classic provides the good description for herbal drugs that are available and are being used till today. Acharya Charak has classified the various medicinal plants in a combination of ten drugs into Fifty different combinations which are mentioned as Mahakashayas on the basis of their actions. Each Mahakasahay is having ten plant drugs, and the name of Mahakashay is given on the basis of their actions and out of them Hridya Mahakashaya is one, which is claimed for having Cardioprotective action.

Cardiovascular disease (CVD) is the leading global cause of death, accounting for 17.3 million deaths per year, a number that is expected to grow to more than 23.6 million by 2030[1]. Cardiovascular diseases encompass atherosclerotic vascular diseases like coronary heart disease (CHD), cerebrovascular disease (CVD), and peripheral arterial diseases. In recent years, demographics and health surveys have reported increasing malaise of CVD among individuals of all socioeconomic strata.

According to recent statistics, incidences of CVD-related death and disability in low-income countries have grown at an alarming pace. In 2008, Gupta et al. reported that India alone is burdened with approximately 25% of cardiovascular-related deaths and would serve as a home to more than 50% of the patients with heart ailments worldwide within next 15 years[2]. The seriousness of current scenario could be gauged by the fact that most CVD sufferers in India happens to be in their productive age which may potentially impose huge socioeconomic burden and devastating consequences over the coming years[3].

In addition to above description of CVD, many Ayurvedic drugs are being used by Ayurvedic Physicians and are providing significant results. In connection of this, it is needing that Charkokta Hridya Mahakashya should be reviewed in reference to CVD.

Need of Study

The present study for the purpose of dissertation was aimed for, to collect and authenticate the sample of each drug mentioned in Hridya Mahakashaya of Charak Samhita from any AYUSH Certified laboratory along with review the classical text books of *Ayurveda* and recent literature regarding Hridya Mahakashaya of Charak Samhita and to carry out the Pharmacognostical Analytical Study of Hridya Mahakashaya of Charak Samhita to find out the relation in reference to Cardioprotcetive activities.

AIM AND OBJECTIVES

1. To collect and authenticate the sample of each drug mentioned in Hridya Mahakashaya of Charak Samhita.
2. To review the classical text books of *Ayurveda* and recent literature regarding Hridya Mahakashaya of Charak Samhita.
3. To carry out the Pharmacognostical Analytical Study of Hridya Mahakashaya of Charak Samhita to find out the relation in reference to Cardioprotective activities.

METHODOLOGY

The Source of material collected from this study from my thesis work

Phytochemical Analysis-

Table No 1. Results obtained in preliminary phytochemical screening

S.No.	Test	Inference
1	Alkaloids	-
2	Steroids	-
3	Carbohydrate	+
4	Tannis	+
5	Flavonoids	-
6	Saponins	+
7	Terpenoids	-
8	Coumarins	+
9	Phenol	+
10	Caboxylic Acid	-
11	Amino Acids	+
12	Resins	+
13	Quinones	-

(+) Present

(-) Absent

Table No 2. Normal presentation of Preliminary phytochemical screening

Tests	Colour if positive	Alcoholic Extract
Alkaloids		
Dragendroff's test	Orange red precipitate	Purple color
Wagners test	Reddish brown precipitate	Reddish brown precipitate
Mayers test	Dull white precipitate	Light pink color
Hagers test	Yellow precipitate	Brown color
Steroids		
Liebermannbuchard test	Bluish green colour	No Bluish green colour
Salkowski test	Bluish red to cherry red color in chloroform layer and green fluorescence in acid layer	No Bluish red to cherry red color in chloroform layer and green fluorescence in acid layer
Carbohydrate		
Molish test	Violet ring	Violet ring
Fehlings test	Brick red precipitate	Brick red precipitate
Benedicts test	Red precipitate	Red precipitate
Tannins		
With FeCl3	Dark blue or green or brown	Dark blue to black colour
Flavanoids		
Shinoda's test	Red or pink	Dark pink colour

Table No 3- PHYSICO-CHEMICAL EVALUATION

S. No.	Parameters	Drug
1	Foreign matter	2.1%
2	Total Ash	7.5%
3	Loss on Drying	11.9%
4	Acid Insoluble Ash	1.22%
5	Alcohol soluble Extractive	8.8%
6	Water soluble Extractive	10.67%
7	pH Value	6

DRUG REVIEW

Looking back into the aim obscurity of prehistoric times, one finds endless and continuous struggle made by man to fight against the disease. Man's survival may be regarded as evidence of success through ages. This struggle still goes on and will continue forever till the best and ultimate solution the any of the disease people suffering from is achieved.

One of the media to achieve the solution of the disease is drug i.e. medicine. Medicine was the foremost amongst all the sciences because fever, pain & death were the mysteries that concerned prehistoric man ever before he began to worry about the stars and the waves. A sick man who responded to the cry may be considered as the first Doctor ever.

In Ayurveda four components of treatment are mentioned and one of them is Drug.

It comprises of one third of Tri Sutra of Ayurveda.

Hridya Mahakashay-

Acharya Charak has described 50 Mahakshaya in the 4th Chapter of Sutra[1] Sthan. It is also called Dashemani. In any group of Dashemani, there are total ten drugs are mentioned and they may be used as single or in compound form as per the need and jurisdiction of Vaidya. In present Dissertation study Haridya Mahakashaya is selected which comprises of following ten Drugs.

1. Amra
2. Amratak
3. Lakucha
4. Karmarda
5. Vriskshamla
6. Amlavetas
7. Kuwal
8. Badar
9. Dadim
10. Matulung

Table No1. Guna – Properties as per - Charaka Samhita:[2]

Drug Name	Bheda	Rasa	Guna	Veery	Doshagnata	Karma
	Apakwa	-	-	-	Piitavardhaka	Raktapitta Kara

Amra	Pakwa	-	-	-	Vataghna	Mamsa-Shukra Balaprada
Amaratak	Madhur	Madhura	Guru, Sasneh	Sheeta	Shleshmala	Brmhana, Tarpana, Vrushya, Vishtambhyajeeryati
	Amla	Amla	-	-	-	Raktapitta Kara
Lakucha	-	Amla	-	-	Pitta-kapha Kara	-
Karamarda	-	Amla	-	-	-	Raktapitta Kara
Vrukshamla	-	-	Ruksha	Ushna	Vata-shleshma Hara	Grahi
Amlavetasa	-	-	Ruksha	Ushna	Vata-shleshma Hara	Grahi, Bhedana, Shula-AruchiVibandhaMandagniMadyaviplavaHikka-ShwasaKasa-VamiVarcagadaVatashleshmaja Sarva Vikara Hara
Kuvala	-	-	-	-	-	-
Badara	-	Amla	-	-	Pitta-kapha Kara	-
Dadima	Amla	Amla	Snigdha	Ushna	Vataghna, Kaphapitta Avirodhi	Hrudya, Grahi, Deepana
	Kashaya	Kashaya, Amla	Ruksha	-	Pitta-anila Kopana	-
	Madhur	Madhura	-	-	Pitta hara	-
Matulunga	Kesara	-	Laghu	-	-	Rochana, Deepana, Hrudya

Table No. 2 - Bhavaprakasha Nighantu[3]

Drug Name	Bheda	Rasa	Anurasa	Guna	Doshagnata	Karma
Amra	Apakwa	-	-	-	-	-
	Pakwa	Madhura	Kashaya	Snighda, Guru, Sheeta	Vatahara, Shleshma Vardhana, Apittala	Vrushya, Balaprada, Shukra Vivardhana
Amaratak	• -	• -	- •	• -	• -	• -
Lakucha	-		-	Guru, Ushna	Tridoshakrat	Vishtambhakrut, Shukra-Agni Nashana, Netrayorahitam
Karamarda	-	Amla	-	Guru, Ushna	Kapha Prada	Ruchya, Raktapitta Hara, Trushna Hara
Vrukshamla	Ama	Amla	-	Ushna	Vatahara	-
	Pakwa	Amla, Katu	-	Laghu, Ruksha, Ushna	Kapha Vatakara	Samgrahi, Rochana, Deepana, TrushnaArshas-GrahaniGulma-ShulaHrudroga Hara
Amlavetasa	-	Atiamla	-	Laghu, Ruksha	Pittala	Bhedana, Deepana, Lomaharshana, Vinmutra Doshaghna, Hrudroga-ShulaGulma-

						PleehaUdavarta-HikkaAnahaHara
Badara	-	-	-	Guru, Ushna	Vatahara, Kapha-pittakara	Ruchyam, Bhedana, Shukrala, Brumhana, Grahi, Daha-Rakta Kshaya-Trushna Hara
Dadima	Madhura	Madhura		Laghu, Snigdha	Tidoshagna	Tarpana, Grahi, Shukrala, MedhaBala Prada, Trushna-DahaJwara-HrudrogaKanta Roga Hara
	Swadamla	-	-	-	Kinchitpittakara	Deepana, Ruchya
	Amla		-	-	Pittajanaka	-
Matulunga	-	-	-	Laghu	-	Deepana, Kanta Shodhana, Jihva Shodana, Hrudaya Shodana, Raktapitta-ShvasaKasa-AruchiTrushna

DISCUSSION

After analyzing the concepts of Hrudaya and Hrudya, the probable mode of action of Hrudya Mahakashaya can be understood easily. All Hrudya Mahakashaya Dravyas are Amla Rasa Pradhana and possess Ushna-Snighda Guna and Vata-Kapha Hara property except for Amra which is Kapha Vardhaka. The Guna Dharma of Amla Rasa can be assumed to be the same as the Guna Dharma of Hrudya Mahakashaya, because Hrudya Karma has been described in relation to its Rasa. Thus, the Guna- Karma of Amla Rasa can be considered similar to the Guna-Karma of Hrudya Mahakashaya, as all of them possess Amla as Pradhana Rasa except Amra.

The properties of Amla Rasa like Ruchikara, Agni Deepana, Pachana, Hrudya, Prenana, Grahi, Bhedana, Vata Anulomana and so on are also applicable to Hrudya Mahakashaya, except Amra which is solely Brumhana in nature with predominance of Swadu Rasa. Few of the drugs among Hrudya Dashemani are not mentioned as Hrudya in the context of Annapanavidhi. But still they have to be considered as Hrudya because they are grouped under Hrudya Mahakashaya by the Aptas.

Discussion on the basis of results of Phytochemistry, Pharmacognostical Analytical Study

Discussion on the basis of Presence of Carbohydrate-

On analytically it was observed that Carbohydrate was present in the given samples of Drugs/Fruits of Hridya Mahakahsya. Many studies have already proven the role of Carbohydrate in the Heart Health. According to J. Mann et.al.[81] The effect of carbohydrates on lipids and lipoproteins has dominated discussions regarding the amounts and classes of carbohydrate likely to reduce cardiovascular risk. While there is no doubt that increasing total carbohydrate at the expense of fat, especially saturated and trans fatty acids in the Western diet, will result in reduction of total and low-density lipoprotein (LDL) cholesterol, concern has been expressed that other predictor of lipoprotein-mediated cardiovascular risk may be adversely affected by substantial increases in total carbohydrate. The potential of high carbohydrates to increase fasting triglycerides was first demonstrated in the 1960s (Ahrens et al.,1961) but later considered to be a transient phenomenon, the hypertriglyceridemia diminishing with prolonged exposure to a high carbohydrate intake (Antonis and Bersohn, 1961; Stone and Connor, 1963).

Discussion on the basis of Presence of Tannins[82]

Tannins have cardioprotective activity via stabilization of pericardial tissue, inhibition of enzymatic degradation of elastin and reduction of the calcification of glutaraldehyde- fixed aortic wall. Hydrolysable tannins, in particular, have anti-ischemic activity and an endothelium dependent vasorelaxant effect through the interplay of different factors such as cyclooxygenase pathway activation, TNF-alpha inhibition, endothelial nitric oxide synthase activation, and scavenging of free radical and reactive oxygen species. It was shown that extracts and purified tannins of Geum japonicum L. (hydrolysable tannins) caused NO- and cGMP mediated potent vasorelaxation in rat aortic rings that had been pre-contracted with the α1-adrenergic receptor agonist

phenylephrine. The phenolic hydroxyl groups of penta-O-galloyl-β-glucoside are essential for its vasorelaxant effects, because this structure without the hydroxyl groups, does not cause vasorelaxation.

Discussion on the basis of Presence of Coumarins[83]

Coumarin based anticoagulants are effective in the treatment and prevention of arterial and venous thrombosis. Nowadays, the main clinical use of coumarins based anticoagulants is the prevention of stroke or systemic embolism in patients with arterial fibrillation, which is one of the most common cardiac disorders. Coumarins are also known to possess anti-oxidant property, which attributes to direct scavenging of reactive oxygen and nitrogen species (ROS and RONs). One important mechanism through which this is achieved is by donating hydrogen to free radicals in its reduction to nonreactive species. Addition of hydrogen would remove the odd electron feature that is responsible for radical reactivity. It is also observed due to inhibition of enzymes like xanthene oxidase, which are responsible for formation of these free radicals.

The basic mechanism for vascular relaxations is by controlling the intracellular concentration of calcium ions. Coumarins are proposed to block the entry of calcium ion by inhibiting its release from the sarcoplasmic reticulum or stop the in-flow of calcium through voltage dependent calcium channels and receptor operated calcium channels located in the membrane of smooth muscle cells.

Discussion on the basis of Presence of Saponins[84]

During the analytical study it was observed that the samples of Hrudya Mahakashaya in the lab exhibit the presence of Saponins. Hyperlipidemia has been defined as elevated cholesterol and triglycerides levels in plasma, and it represents one of the major risk factors associated with coronary heart disease. The incidence of hyperlipidemic has increased worldwide because of an augmented fat consumption. Saponins have hypolipidemic effect, due to this hypolipidemic effect Saponins act as a cardioprotective. In research study it was found that saponins have anti-inflammatory action too. It reduces the inflammation of heart vessels and act as a cardioprotective.

Discussion on the basis of Presence of Vitamin C

The drugs mentioned in Haridya Makashaya in drug review, as is a proven rich source of anti-oxidants. This finding matches with the Hrudya property, which means protecting and promoting heart health claimed by our ancient Acharyas. Researches on such drugs which are mostly organ targeting with minimal toxic effects is the need of the hour. Most of them like Mango, Dadima, Lemon, Plum etc. are the cheapest and easily available dietary fruit can play a major role in the treatment of Hrudroga in a preventive way, as oxidative stress forms the main reason for CVD.

Free radicals are highly unstable molecules produced naturally as a by-product of chemical reactions in our cells and also when we are exposed to toxins. Electrons typically come in pairs. Free radicals contain an unpaired electron which is what makes them highly unstable, they will wreak havoc to steal the electrons they need from their neighboring molecules. In doing so, they can cause significant damage to the cells in the body and can set off chain reactions that is termed as oxidative damage and oxidative stress. Our bodies have defenses against free radicals, but when the strength of these defenses is outweighed by the number of free radicals, they can cause lasting harm and even cell death.

The evidence of vitamin C ‘s beneficial effects on the heart proved an association between high blood levels of vitamin and a healthy cholesterol profile. Vitamin C is found to increase HDL and decrease LDL to considerable level (Sharma, 2003). Vitamin C has potent antioxidant property. It reduces free radicals by directly binding to oxidizing chemicals and converting them to less harmful molecules. Vitamin C is proved to be a potent antioxidant in addition it is also a good stress buster.

Role of vitamin C in improving the cardiac structure and functions is very clear from various studies (Akolkar et al., 2017). Therefore, the drugs of Hridya mahakashaya act as Hridya (cardio tonic). Similarly, the found saponins has anti- inflammatory action for blood vessels and according to many studies, in heart diseases inflammation takes place and heart is a modified blood vessel, so by making this relation, it can be considered that Hrudya Mahakashaya drugs has the clear role against the heart diseases.

CONCLUSION

Hrudaya is the seat of Buddhi and Chetana as it controls Shareera, Manas and Indriyas. Thus, Hrudaya is considered as a psycho-somatic entity, if afflicted all the Prakruta Shareerika and Manasika functions are hampered leading to the manifestation of Hrudrogas. Hrudya is that phenomenon or a Dravya which is both Hita and Priya to Hrudaya and its Ashrayi Manas. All Hrudya Mahakashaya Dravyas are Amla Rasa Pradhana. The Guna Dharma of Hrudya Mahakashaya can be implicated to be the same as that of Amla Rasa. Since Hrudya Karma has been elucidated in relation to its Rasa. Amla Rasa is the best among the Hrudya Dravyas, as it is Tarpaneeya to Hrudaya and Prarthaneeya to Manas by nature. Amla Rasa and Rakta Dhatu are closely related to each other in terms of Panchabhautikatva, Guna, influence on Dosha and Hrudaya, Nidana, Roga and Chikitsa thereby contributing their combined effect in understanding the mechanism of Hrudaya Karma. Presence of Carbohydrate, Saponins, Vitamin C, Coumarins etc. in Analytical study also exhibit that all these Drugs/ Fruits mentioned in Hridya Mahakashay, may exhibit the role as Cardiotonic, Antihyperlipidemic action and also in other Cardiovascular Disorders, due to their Anti-Oxidant, Anti-inflammatory actions/ properties.

ACKNOWLEDGEMENT

I'd would like to express my gratitude towards my guide Dr. Bhavna Singh, My co guide Dr. Sahana V.M. Vats Uttaranchal Ayurvedic college, Dehradun. And Dr. Vimla Bishnoi, And Also thanks to, Department of

Dravyaguna all the faculty members, PG Scholars and staff of Department of Dravyaguna, UAU, all the family members.

Conflict of Interest – Nil

Source of Support & Finance - None

REFERENCES

1. Yadavji Thrikamji Acharya Editor. Charakasamhita, Sutra Sthana 4/10, Chowkambha Surabharathi Prakashan, 2013.
2. Acharya YT, editor, (1st ed.), Ayurveda Deepika commentary of Sri Chakrapanidatta on Charaka Samhita of Agnivesha, Sutra Sthana; Annapanavidhi Adhyaya: Chapter 27, Varanasi: Chaukhambha Surbharati Prakashan, Reprint 2011; P-160.
3. Pandey G.S, editor, Hindi Commentary by Prof. Krishnachandra Chunekar on Bhavaprakasha Nighantu of Bhavamishra, Amradi Phala Varga, Verse 101-104, Varanasi: Chaukhambha Bharati Academy, Reprint 2010; P-570.
4. The Ayurvedic Pharmacopoeia of India, Part 1, Vol 4, New Delhi: National Institute of Science Communication and Information Resources (NISCAIR), CSIR, 2004; P-18.
5. Elwira Sieniawska, Activities of Tannins – From In Vitro Studies to Clinical Trials, Department of Pharmacognosy with Medicinal Plant Unit, Medical University of Lublin, Lublin 20-093, Poland, 2015, Vol 10, No.11, 1877-1884
6. Tejas Padte, Suhas Pednekar and Pushkar Shejwalkar, Applications of Coumarins as Cardiovascular and Anti-Cancer Agents: A Short Review, Journal of Cardiology and Cardiovascular Therapy, Vol 8, Issue 5, December 2017
7. . Mariangela Marrelli, Filomena Conforti, Fabrizio Araniti and Giancarlo A. Statti, Effects of Saponins on Lipid Metabolism: A Review of Potential Health Benefits in the Treatment of Obesity, Molecules 2016, 21, 1404; doi:10.3390/molecules21101404.