



## Research Article

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### ASSOCIATION OF MAHASROTAS AND AGNI VITIATION WITH CORONARY HEART DISEASE

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#### ABSTRACT

**Aim:** To study association of Mahasrotas & Agni vitiation with Coronary Heart Disease. Agni & Mahasrotas (GIT) remain pivotal in pathophysiology of almost all diseases. Hrudaya & Mahasrotas are interlinked as they are Moolasthan of Pranavaha Srotas. A study for Mahasrotas & Agni vitiation in connection with CHD i.e. coronary heart disease was planned. **Methodology:** Observational study with survey method. A questionnaire evaluating causative factors & symptoms of Annavaha & Purishavaha Srotas & Agni vitiation was developed. **Result:** Ati Matrasya Bhojana (Excess food intake), Akale Bhojana (Untimely food consumption) & Ahitasya Bhojana (Improper food) all of three Causative factors shown positive association with CHD. Purishavegavidharana (Suppressing defecation urge), Atyashana (Excess food intake), Ajeernadhyashana (food intake before digestion of previous), DoorbalAgni & Kruushtwa (thin) are causative factors of vitiation of Purishavaha Srotas. Except krushtwa all other were seen associated positively. Agni Vitiation Causative factors like Abhojana (Fasting), Vishamashana, Asatmya (Intolerable food) Bhojana, Guru (Heavy to digest) Bhojana, Sheet Bhojana, Ati Rooksha Bhojana & Vega Vidharana (Urges suppression) were seen significantly associated. **Discussion & Conclusion:** Causative factors those lead to Udavarta & Agni vitiation & vitiation of rest four types of vata dosha are seen associated. There is a strong association between Mahasrotas (GIT) & Agni vitiation with Coronary Heart Disease. Annavaha Srotas is seen more associated than Purishavaha Srotas. Drava & Ushna Guna dominated abnormality in Mahasrotas are not associated with CHD. Adhman (Flatulence), Aatop (Tense abdomen) & Vishtambha (Constipation) are closely associated phenomena.

**Key words:** Coronary Heart Disease, Cardiac Health, Mahasrotas, Agni, GIT

#### INTRODUCTION

Ayurved has its own ideology of Sharir (anatomy & physiology), causative factors & samprapti (aetio-pathology) & medicine. Agni & Mahasrotas remains pivotal in pathophysiology of almost all diseases. According to Charakacharya 'Hrudaya' & 'Mahasrotas' are Moolasthan of Pranavaha Srotas.<sup>1</sup> According to commentator Gangadhara, 'Vaksha' i.e. whole cardiopulmonary apparatus is the meaning of 'Hrudaya' in said case. Gangadhara explains Mahasrotas as 'Mahachhidram Mahasaranam'. This clearly means the whole alimentary canal starting from mouth up to anus. Consideration of 'Mahasrotas' as a 'Moolasthan of Pranavaha Srotas' as in Charak samhita is praiseworthy consideration, as this classic belongs to school of physicians. 'Mahasrotas' is place of JatharAgni, process of Awasthapaka (& hence place for Udirana of Dosha) & Pachana. Mahasrotas is also considered as 'Abhyantar Roga Marga' among three of roga marga. Unique shodhana treatments of vamana, virechana & basti are done via Mahasrotas only. Thus Mahasrotas & Hrudaya are interlinked closely.

#### Coronary heart disease

First Known Use of the term 'Coronary heart disease' was in 1949.<sup>2</sup> 'Coronary heart disease' is defined as progressive reduction of blood supply to the heart muscle due to narrowing or blocking of a coronary artery (atherosclerosis). Short-term oxygen deprivation can cause angina pectoris. Long-term, severe oxygen depletion causes a heart attack, bypass or angioplasty is needed if medication and diet do not control the disease.<sup>3</sup> Coronary heart diseases (CHD) have reached epidemic proportions among Indians. India is undergoing a rapid health transition with rising burden of CHD with a two-fold rise in rural

areas and a six-fold rise in urban areas between the years 1960 and 2000 particularly in last two decades. Studies among Indian migrants in various parts of the world have documented an increased susceptibility to CHD in comparison to the native population studied. Prevention is based on causative factors.<sup>4</sup>

Conventionally risk factors for coronary artery disease are high LDL cholesterol, low HDL cholesterol, high blood pressure, family history, diabetes, smoking, being post-menopausal for women and being older than 45 for men & Obesity. Scientific world has already chalked out the protocol for prevention of CHD as heart healthy eating, maintaining healthy weight, managing stress, quitting smoking & physical activity.<sup>5</sup> In spite of plenty of research & publications on preventive cardiology, CHD still continues to be a mega threat for human health & life. This is simply because of complexity of aetiopathology of CHD. Gerald M concludes that, 'Cohort study design, almost universally applied in major CHD investigations in the United States, allowed epidemiologists to manage multiple aetiological hypotheses, calculate morbidity incidence, and define the natural history of the disease. Unlike lung cancer, where one powerful determinant dominated, CHD epidemiology reported multiple 'risk factors' producing small effects. Causal relations, especially in the absence of clinical trials, proved difficult to establish. Despite this difficulty, CHD epidemiologists pressed physicians to begin modifying risk factors in 'susceptible' patients. That clinical rather than environmental risk facts predominated may have made medical suasion easier.'<sup>6</sup>

Here an Ayurvedic viewpoint can indeed add a value in not only preventive cardiology as well as in management of it. Many scholars have proved efficacy of Ayurvedic herbs/herbomineral preparations on different cardiac ailments. Most of research

works are seen focused on conventionally proven risk factors & efficacy of Ayurvedic medicines same risk factors like Hypercholesteromia. But Ayurveda is not drug oriented but a patient-oriented system of medicine. There is need to understand that apart from works on validation of cardiogenic herbs & formulations, we need to revisit pathophysiology of CHD in Ayurvedic epistemological point of view. Hrudaya (Heart with lungs) as a site of Prana (vitality element & one of type of vata) & Moolasthan of Pranavaha Srotas (System designated for prana & oxygen metabolism) is needed to be explored in same context. Role of Rasavaha & Pranavaha Srotas & vitiation of sira in CHD is too explained by some scholars.<sup>7</sup> However role of ‘Mahasrotas (GIT) & Agni vitiation’ in CHD is needed to be explored.

**Aim:** To study association of Mahasrotas & Agni vitiation with Coronary Heart Disease

**Hypothesis:** Hrudaya & Mahasrotas are interlinked as they are Moolasthan of Pranavaha Srotas. Mahasrotas & Agni vitiation may be associated with CHD i.e. coronary Heart disease.

**Ethical Clearance:** As per the ICMR guidelines for Ethical Research, the proposal of this study was presented before ‘Institutional Ethics Committee’ (IEC), BVDU, College of Ayurved, Pune. Meeting of Institutional Ethical committee held on 22/03/2013. Approval (BVDUCOA/ EC/186/ 13-14 dated 01/06/13) from Institutional Ethical committee was received and work was started after IEC approval.

## MATERIALS AND METHODS

A questionnaire is developed as a tool for proposed observational study. Questions were derived from verses mentioned in Charaka Samhita for vitiation causative factors & vitiation symptoms of Annavaha & Purishavaha Srotas. Agni vitiation causative factors & symptoms were derived from verses of Charaka Grahani Chikitsa chapter. The questions were designed as closed ended so that they would be easy to quantify the items & make tool more reliable.

## OBSERVATIONS

**Table 1: Annavaha Srotas vitiation causative factors**

	A		B		C		D		E		DF	Chi sq	P value
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%			
Atimatrasya bhojanat	15	10	19	12.7	51	34	25	16.7	40	26.7	4	24.87	0.000
Akale Bhojanat	15	10	23	15.3	49	32.7	27	18	36	24	4	26.41	0.000
	Yes		No		Previous		-	-	-	-	DF	Chi sq	P value
	Freq	%	Freq	%	Freq	%	-	-	-	-			
Ahtiasya bhojana	89	59.3	45	30	16	10.7	-	-	-	-	2	18.12	0.000

**Table 2: Annavaha Srotas vitiation symptoms**

	A		B		C		D		E		DF	Chi sq	P value
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%			
Annabhilasha	36	24	32	21.3	46	30.7	24	16	12	8	4	14.59	0.001
Aruchi	33	22	51	34	38	25.3	17	11.3	11	7.3	4	21.13	0.001
Avipak	36	24	32	21.3	46	30.7	24	16	12	8	4	20.21	0.001
Chhardi	104	69.3	21	14	15	10	9	6	1	0.7	4	20.13	0.001

**Piloting the questionnaire:** Pilot study was carried out on 15(10%) patients. This helped in understanding that questions are understood by all classes of patients. Few corrections in framing of words were done in same regards.

**Reliability of questionnaire:** The reliability of the questionnaire was examined using by applying Cronbach’s alpha which indicates good internal consistency of the items in the scale. In the pilot study value of Cronbach’s alpha i.e. 0.76 was obtained for overall scales.

**Source of Data:** 150 pre diagnosed patients (coronary angiography done) of coronary heart disease were selected from Bharati Medical Foundation’s hospitals & other Pune based hospitals & Ayurvedic clinics. Subjects who fulfill inclusion criteria & were willing to be included in study were included. Written consent was obtained from patients before survey.

**Inclusion criteria & Exclusion criteria:** Both male & female prediagnosed Patients for CHD (Single / bi / tri vessel disease with one of blockage not less than 35%) after coronary angiography. Patients of CHD with other major systemic disease, DM, with all kinds of acute conditions. Patients taking medication for gastrointestinal complaints. ex. laxatives, antacids, or ayurvedic preparations /therapies for same were excluded. Patients fulfilling above mentioned criteria were provided with consent form in local language. The method of interview used in study was structured interview, as the questions asked were a set / standardized order and the interviewer was supposed to ask them in a prescribed interview schedule. Face to face method of interview promised the validity of answers.

**Method of data processing:** The analysis was done using SPSS tool-Non Parametric Chi-Square Test. And the bar graph representing the choices by the participants for the selected questions was drawn using Excel Tool, under guidance of biostatistician

**Table 3: Purishavaha Srotas vitiation causative factors**

	A		B		C		D		E		DF	Chi sq	P value
	Freq	%											
Purishavega Vidharana	24	16	32	21.3	46	30.7	24	16	24	16	4	22.83	0.000
Atee ashana	15	10	19	12.7	51	34	25	16.7	40	26.7	4	24.87	0.000
Ajeernadhyashana	15	10	24	16	39	26	20	13.3	52	34.7	4	23.24	0.000
	Yes		No		-	-	-	-	-	-	DF	Chi sq	P value
	Freq	%	Freq	%	-	-	-	-	-	-			
DoorbalAgni	92	61.3	58	38.7	-	-	-	-	-	-	1	12.92	0.000
Krishatwa	64	42.7	86	57.3	-	-	-	-	-	-	1	12.80	0.000

**Table 4: Purishavaha Srotas vitiation Symptoms**

	A		B		C		D		E		DF	Chi sq	P value
	Freq	%											
Kruchra purisha	33	22	9	6	53	35.3	24	16	31	20.7	4	18.06	0.001
Sashabda purisha	74	49.3	22	14.7	31	20.7	15	10	8	5.3	4	13.38	0.001
Sashoola purisha	63	35.3	21	14	24	16	30	20	12	8	4	13.34	0.001
Atee drava purisha	73	48.7	27	18	25	16.7	17	11.3	8	5.3	4	13.28	0.001
Atee grathita	32	21.3	19	12.7	35	23.3	34	22.7	30	20	4	17.67	0.001
	Yes		No		-	-	-	-	-	-	DF	Chi sq	P value
	Freq	%	Freq	%	-	-	-	-	-	-			
Atee bahu purisha	61	40.7	89	59.3	-	-	-	-	-	-	1	13.13	0.001
Alpalpa purisha	87	58.0	63	42.0	-	-	-	-	-	-	1	10.45	0.001

**Table 5: Agni Vitiation Causative factors (Charaka Grahanidosha chikitsa)**

	A		B		C		D		E		DF	Chi sq	P value
	Freq	%											
Abhojanat	41	27.3	42	28	24	16	12	8	31	20.7	4	22.81	0.000
Sheet bhojanat	17	11.3	51	34	38	25.3	17	11.3	27	18	4	15.32	0.000
Sandushta bhojanat	47	31.3	50	33.3	32	21.3	12	8	9	6	4	17.76	0.000
Vega vidharanat	34	22.7	36	24	46	30.7	24	16	10	6.7	4	21.13	0.001
	Yes		No		-	-	-	-	-	-	DF	Chi sq	P value
	Freq	%	Freq	%	-	-	-	-	-	-			
Vishamashana	50	33.3	100	66.7	-	-	-	-	-	-	1	15.71	0.000
Asatmya bhojana	23	15.3	127	84.7	-	-	-	-	-	-	1	15.51	0.000
Guru bhojana	96	64	54	36	-	-	-	-	-	-	1	13.25	0.001
Atee rooksha bhojana	98	65.3	52	34.7	-	-	-	-	-	-	1	15.32	0.000
Shodhana vibhrama	3	2	147	98	-	-	-	-	-	-	1	12.07	0.001
Vyadhi karshana	55	36.7	95	63.3	-	-	-	-	-	-	1	11.99	0.001

**Table 6: Agni vitiation symptoms**

	Yes		No		-	-	-	-	-	-	DF	Chi sq	P value
	Freq	%	Freq	%	-	-	-	-	-				
Aasyavairasya	105	63.3	45	36.7	-	-	-	-	-	-	1	17.57	0.001
Amlak	64	42.7	86	57.3	-	-	-	-	-	-	1	17.54	0.002
Urodaha	59	39.3	91	60.7	-	-	-	-	-	-	1	10.01	0.002
Udar daha	107	71.3	43	28.7	-	-	-	-	-	-	1	9.96	0.002
Aadhman	86	57.3	64	42.7	-	-	-	-	-	-	1	12.85	0.002
Aatop	76	50.7	64	49.3	-	-	-	-	-	-	1	9.91	0.002
Aanah	69	46	81	54	-	-	-	-	-	-	1	12.80	0.002
Vishtambha	90	60	60	40	-	-	-	-	-	-	1	9.84	0.002
Gala vidaha	40	26.7	110	73.3	-	-	-	-	-	-	1	6.53	0.011

DF: degree of freedom, Chi. Sq. : Chi square value.

a) Rare b) 1/7 days c) 2-3/7 days d) 4-5/7 days e) almost daily i.e. 6-7/7 days

## DISCUSSION

### Annavaaha Srotas

Ati Matrasya Bhojana (Excess food intake), Akale Bhojana (Untimely food consumption) & Ahitasya Bhojana (Improper food) are vitiation causative factors of Annavaaha Srotas. All of three show a positive association with CHD. Excess quantity of bhojana is a vitiation causative factor of Annavaaha Srotas & purishavaha Srotas as well as a vitiation causative factors for Prana Vayu. Ahara pranayana is function of Prana & thus gets vitiated by excess of Ahara.<sup>8</sup> Excess intake of food is also

considered as agrya causative factors of Aama.<sup>9</sup> Akale bhojana is vitiation causative factors of Annavaaha Srotas as well as a vitiation causative factors for samana vayu.<sup>10</sup> Timely bhojana is considered as agrya causative factors for aarogya.<sup>11</sup> The homeostatic mechanism of tridosha is regulated in context with Kala i.e. time. Samana vayu & Agni both get vitiated with an untimely lunches. Thus akale bhojana not only vitiates samana vayu & Annavaaha Srotas but also interrupts dosha gati which is maintained by timely ahara. Ahita food items not only vitiates Annavaaha Srotas but also vitiates Aharrasa & Rasa dhatu in turn.

## Purishavaha Srotas

Purishavegavidharana (Suppressing defecation urge), Atyashana (Excess food intake), Ajeernadhyashana (food intake before digestion of previous), Doorbala Agni & Krushtwa (thin) are causative factors of vitiation of Purishavaha Srotas. Except Krushtwa all other factors were seen associated positively. Purishavega vidharana leads to udavarta. Role of udavarta in CHD pathogenesis is discussed earlier. Vegadharana is considered as agrya factor for non-health.<sup>12</sup> Some studies have reported vitiation of neurohumors due to Vega dharana.<sup>13</sup> Ajeernadhyashana shows positive association. Ingestion of food before completion of digestion of previously taken one is an Agrya factor for vitiating Grahani<sup>14</sup> as well as Purishavaha Srotas. Doorbalagni which is also showing a positive association refers to incompetency of Agni to digest food. Both Ajeernadhyahana & Doorbala Agni result in formation of Rasa Dhatu of deranged quality. Krushatwa refers to less Upachaya. Agni is dependent on Snigdha Guna and thus on Dhatu. However, in present study Krushtwa is not seen associated with CHD.

## Agni vitiation causative factors

Agni vitiation causative factors like Abhojana (Fasting), Vishamashana, Asatmya (Intolerable food) bhojana, Guru (Heavy to digest) bhojana, Sheet bhojana, Ati rooksha bhojana, Sandushta bhojana, Shodhana vibhrama, Vyadhi karshana, Vega vidharana (Urges suppression) were assessed. Abhojana is a causative factor for Pranakshaya. It also results in depletion in Rasa Dhatu. Anashana is considered as agrya factor for depletion in life span.<sup>15</sup>

History of Vishamashana (Irregular food habits) was found significantly. Vishamashana is considered as agrya factor for Agni vitiation.<sup>16</sup> Asatmya bhojana too is an important vitiation causative factors for Agni however it was not found significantly. Guru bhojana was found significantly. It is considered as agrya causative factors for making disturbance in process of vipaka i.e. final stage of digestion.<sup>17</sup> Thus it directly alters composition of Rasa dhatu, making it more Guru with deranged Vipaka. Sheeta bhojana & Atee rooksha bhojana were found significantly. Sneha is the very basic prerequisite for functioning of Agni. Sandushta bhojana & Shodhana vibhrama are important vitiation causative factors for Agni, however they were not found significantly. Vega vidharana was found significantly in frequencies like Rare, 1/7 days, 2-3/ 7 days. Vega vidharana leads to Udavarta & results in Agni vitiation & vitiation of rest of four types of Vata Dosha.

## Annavaha & Purishavaha srotovitiations symptoms

Annanabhilasha (Anorexia), Aruchi (Tastelessness), Avipaka (indigestion), Chhardi (vomiting) are vitiation symptoms of Annavaha Srotas. All of them except Chhardi are showing a positive association in survey study carried amongst CHD participants. Krucchra Purisha (hard stool), Alpalpa Purisha (less stool), Sashabda Purisha (sound while defecation), Sashoola Purisha (Painful defecation), Atee Drava Purisha (Liquid stool), Atee Grathita Purisha (very hard stool), Atee Bahu Purisha (feces in excess) were assessed. Krucchra Purisha was reported more in rarely & 2-3 per week frequency. Krucchra in purisha pravartana denotes loss of purisha sneha which is mala of majja dhatu. Majja is a quality sneha working at level of manas & buddhi. Vata vrudhhi & depletion of sneha is at purishavaha Srotas result in krucchra purisha. Alpalpa Purisha is seen in 58% participants. It denotes excess shoshana. Vitshosha is seen as symptom of vataja pandu thereby implies rasa dushsti again. Sashabda purisha was found more in rare or 2-3 days per week frequencies. This is because of vata pradhana vitiation in purishavaha Srotas.

Sashoola purisha was found more in rare or 3-4 days per week frequencies. Shoola again denote dominance of vata/ rakta vitiation. Atee grathita purisha was found more in more frequencies. Role of vata vitiation & udavarta is explained earlier. Atee drava purisha was mostly found in rare cases. Thus, it can be remarked that Drava guna pradhana vitiation of grahani / pakwashaya is not associated herewith. Atee Bahu Purisha i.e. relatively more volumes of purisha were not found significantly.

## Some more important symptoms

Aasyavairasya (Altered taste in mouth), Amlak (Sourness), Urodaha (chest burn), Udar daha (burning in abdomen), aadhmaan (Flatulence), aatop (tense abdomen), aanah, vishtambha (Constipation), Gala vidaha (burning in throat) were assessed. Aasyavairasya was found significantly. It denotes vitiation of Rasa dhatu.

Amlaka was not found significantly. As reported earlier Atee drava purisha was also not significant. Thus it can be remarked that drava guna pradhana vikriti in Mahasrotas is not associated with CHD. Urodaha, Udar daha & Gala vidaha are not seen associated with CHD participants. Thus it can be remarked that ushna guna pradhana vikriti in Mahasrotas is not associated with CHD. In earlier studies scholars have reported association of CHD with kapha & vata-kapha prakriti.

Aadhmaan is seen associated positively. Genesis of vayu is as a mala of anna during third Awasthapaka of ingested food. Altered metabolism in pakwashaya results in same.

Aatop i.e. gud-gud sound was seen positive in half of participants. It denotes Agni vitiation.

Aanah i.e. tension in abdomen & constipation was reported by less than half of participants & thus was not seen associated. Vishtambha i.e. constipation as well as obstruction in passing of flatus was reported by 60% participants. The vishtambha is part & parcel of udavarta.

## CONCLUSION

There is a strong association between Mahasrotas & Agni vitiation with Coronary Heart Disease. Annavaha Srotas is seen more associated than purishavaha Srotas. Drava & ushna guna pradhana vikriti in Mahasrotas are not associated with CHD. However, adhmaan, aatop & vishtambha are closely associated phenomena. Role of the Mahasrotas vitiation in manifestation of CHD is needed to be studied at demonstrable level studies.

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