

Role of Genetic, Dietary and other Lifestyle Factors on Incidence and Prevalence of Kapha Medo Margavarana (Hyperlipidemia)

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ABSTRACT

The Incidence and prevalence of disorders caused due to metabolic aberration in kapha and medas is mounting up in the general public in recent times. The present survey was done on 87 patients of kapha medo margavarana (Hyperlipidemia) to study factors influencing the occurrence of this disorder. Greater percentage of the study group was females engaged in household works and a large number of subjects were from middle and upper socioeconomic status. Maximum number of the survey populace was worried about their unusual weight gain and BMI. Nearly 30% of them were above 32 risk factors related to dietetics, lifestyle and genetic issues were seen in the major percentage. Psychological stress, unsatisfied sexual life, and sedentary life were the other noticeable findings observed. Symptoms and signs of morbidity of kapha and medas, deviation in the normal functioning of rasa vaha and medo vaha srotas, were the key results of the study.

Key words: Kapha medo margavarana; Hyperlipidemia; Lifestyle; Body mass index.

INTRODUCTION

Kapha medo margavarana is a metabolic derangement in which etiological factors lead to unusual and unwarranted accretion of kapha and medas in various channels of physiology in the body, ensuing in encumbrance to the customary movement of vata dosha and other drava dhatu like rasa and rakta. The phenomenon of kapha medo margavarana works as the principal operative factor in the incidence and progression of a number of ailments like Prameha (Diabetes mellitus), Santarpanotha vyadhi (Metabolic

syndrome), Sthaulya (Obesity and Overweight), Vatarakta (Peripheral arterial disorders), Hridroga (CVD) etc. The incidence of dyslipidemia and its prevalence has become extremely common in Indian populace due to the metabolic consequences associated with changes in diet and lifestyle.

The formation of excess of kapha and meda consists mainly of kleda and as the text opines the unwanted buildup of abadhya meda is nothing but ama (free radicals); which leads to avarana (blockage/encapsulation) in the affected srotas (atherosclerotic changes). The free radicals are always in a state of instability due to the presence of unpaired electron in the outer shell and are highly reactive chemical entities. In the same way, ama is a highly reactive pathological entity which takes part in the pathogenesis of so many illnesses¹.

The reference of kapha medo margavarana is accessible in the context of Vatarakta², where the line of management of kapha medo margavarana janya vatarakta is absolutely diverse from that of routine line of dealing.

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The direction of guggulu, shilajit and rest of the medications elucidated in this context is also advocated in other analogous situations akin to Prameha, Sthaulya, Hridroga screening where the pathology is identical.

The present study was an endeavor to apprise the issues of kapha medo margavarana (Hyperlipidemia) in relation to the genetic, lifestyle, and dietary facets and also to understand the on common clinical appearance of this metabolic derangement.

AIMS AND OBJECTIVES

The study was targeted to get a broad-spectrum view on the role of various demographic, genetic and other common risk factors in the incidence of kapha medo margavarana (Hyperlipidemia), and also to scrutinize the dosha, dooshya and other pathological factors involved in the demonstration and evolution of kapha medo margavarana with its clinical presentation.

MATERIAL AND METHODS

Eighty-Seven patients with high blood lipid profile who attended the OPD of Department of Kayachikitsa of IPGT & RA hospital, Gujarat Ayurved University, Jamnagar during the period April 2010 to March 2011 were included in this study irrespective of sex, caste and creed. The informed consent was taken from every patient at the outset. A thorough proforma was prepared incorporating all the points of demography, history taking and examination aspects in which the data were documented. Descriptive statistical analysis was done for the vital records.

Criteria for inclusion

Serum total cholesterol level -201mg/dl or more.

Serum triglyceride level - 151mg/dl or more

Serum LDL-C level - 131mg/dl or more

Serum VLDL-C level 41mg/dl or more

Exclusion criteria

Patients below 25 years of age and above 60 years of age were disqualified from the inspection. Also, cases of type 1 diabetes mellitus and those afflicted with serious systemic disorders were not selected for this work.

OBSERVATIONS AND RESULTS

Out of 87 patients who participated almost 64% were females against barely 36% males. Even though the age criterion for the selection was 25-60 yrs, most number of patients belonged to the age group of 45-55 and 35-45 (33% and 31% respectively in each class). A large part of the subjects were from Hindu society (71 patients i.e. 81.61%) and residual 16 (18.39%) pursued Islamic beliefs. Among the 87 patients of kapha medo margavarana highest number, 80, (nearly 92%) subjects were married meager 4% were single, and remaining 4% had lost their spouse.

Maximum 35.63% had achieved basic tutoring, 19.54% were graduates and 6.90% had done post graduation, 11.49% and 3.45% had only primary or mid school level tuition respectively and 6.90% were illiterate. It was observed that 55.17% of patients (females) were housewives, making up the principal category for the current study, while the rest of the patients were engaged in other professions. Patients engaged in business (16.09%) and office related work (8.06%) formulated the further two most important classes in this division. 60.92% of patients fit into mid socioeconomic rank and 19.54% and 2.30% were from upper middle and rich classes respectively. The rest were from lower socioeconomic grade.

The mean height of 87 patients integrated in the survey was 163.943 ± 0.903 ; mean mass was 78.003 ± 1.409 , and mean BMI was 29.102 ± 0.568 . BMI of majority of patients was higher than 23 (88.51) in which 29.89% had BMI of 32 or greater. Only 11.49% had BMI below 23.

Fig. 1: The mode of profession in patients of kapha medo margavarana

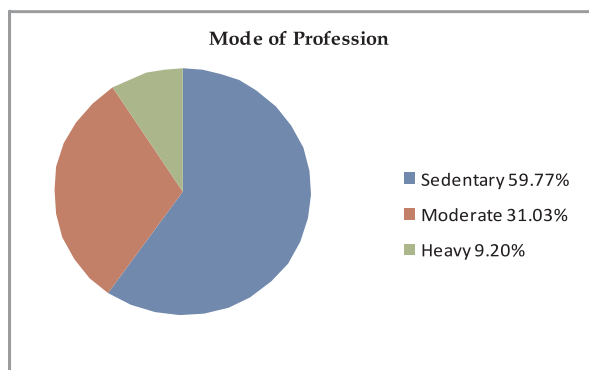


Fig. 2: Psychological assessment in patients of kapha medo margavarana

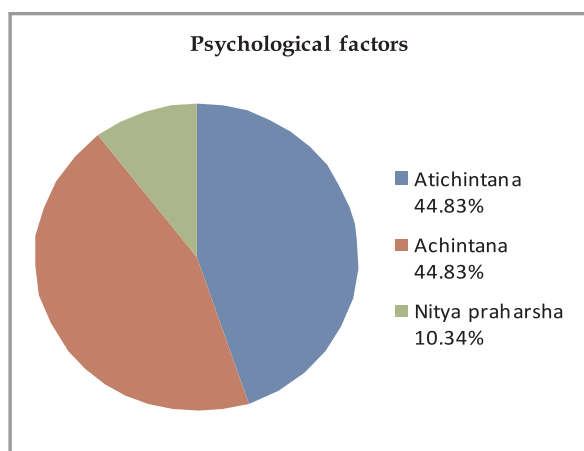


Table : Evaluation of etiological factors in subjects of kapha medo margavarana

Nidana	Number of patients	% of patients
Aharaja	59	67.82%
Viharaja	75	86.21%
Manasika	49	56.32%
Vyadhi vishesha	38	43.68%
Beeja dushti	64	73.56%

Using Holmes and Rahe stress scale in terms of life change units, about 50.57% of study populace reported to have stress and strain range scoring between 1-300, but none had score above 300.

Clinical observation

There was 82.76% of patients complained of remarkable weight gain. Generalized fatigue

(70.11%), pain in major weight bearing joints (45.98%), weightiness of body (40.23%), exertional dyspnoea (33.33%), hyperhidrosis (32.18%), polyphagia (32.18%), polydypsia (29.86%), lethargy (5.75%), hypersomnia (3.45%), disproportion of body parts due to projected belly-breast-hip-waist etc (35.63%), awful odor of perspiration (32.18%) were the other widespread complaints observed in the survey mass. The problems was chronic in all the patients (100%) 57.47% reported to have slow commencement of said above troubles while in 31.03%, the beginning was subtle. None of the patients reported to have acute or sudden onset. The general path and succession of the illness was unremitting in the majority of the subjects (77.01%) next to 22.99% of patients who had intermittent course. The chronicity of the sickness was recorded to be of 1-5years in about 54.02% of patients. 20.69% of people who participated in this survey gave a previous history of high blood cholesterol levels, 28.74% patients were hypertensive, 14.94% were type 2 diabetic, 3.45% were suffering with peripheral vascular diseases, 1.15% had renal complaints and 3.45% were known cases of IHD. 21.84% of patients took medicines containing beta blockers and a history of intake of estrogen pills was present in 6.90% of patients. History of administration of corticoids gluco (3.45%) and bile acid binding resins (1.15%) was also present in few patients.

Role of genetics

Familial history of dyslipidemia was reported in about 18.39% of patients. Obesity was running in the family of 45.98%, diabetes mellitus in 37.93%, IHD in 3.45% of families and hypertension in 21.84%.

Dietetic observation

In maximum number of the subjects, desire for food was very high (55.17%) while it was modest in 37.93% of subjects. Poor hunger and low desire for food was observed just in a minor fraction of 6.90%. The major part of the present study populace followed strict vegetarian diet (64.37%) against the mixed

diet followers which comprised of only 36.78%. The favorite and most commonly used flavor by most of the patients was katu rasa (pungent) followed by madhura rasa (sweet) encompassing 78.16%. Lavana (salt dominating) was also significantly used in eatables by 45.98% of patients. Dominance of guru guna (food articles and dishes that are heavy in quality) was noticed in the ordinary diet of 82.76% of patients, followed by snigdha guna (oily and fatty) in 57.47% of subjects. Food stuff with sheeta guna (cool by nature) was in routine use by 39.09%, and also ushna guna (naturally hot articles) by 45.98%. None of the subjects followed proper diet pattern and habits Irregular diet pattern was in practice in 81.61% and faulty dietary habits like samasana (mixing of wholesome and unwholesome items) in 43.68%, eating beyond ones digestive capacity or taking food prior to the digestion of previous meal (adhyasana) in 50.57% were also observed in the study population. Wheat was the major staple food of the locality (91.95%), while rice came the next, place with 78.16% using it daily in their mealtime. Dal items were the next major ration in 77.01% of subjects. 80.86% were using root tubers in their food stuffs regularly. Green leafy vegetables were part of the diet of 90.80% people.

Among fruit items, banana (52.87%) and mango (50.57%) were the most common ones used by major part of this study group. 91.95% of people were taking tea daily whereas 25.29% preferred to have coffee.

Food substances prepared by deep frying were in regular use by 66.67% of people. The most widely used cooking oil by 57.47% of present survey population was cotton seed oil, 27.59% used groundnut oil, sunflower oil was used by 8.05% and another 4.60% used soyabean oil. Among 32 non-vegetarian subjects 84.38% were taking poultry chicken. Amongst red meat, mutton was in use by 71.88% people. Sea foods were in regular practice by 59.38% and eggs by 53.13%. In milk and milk products, butter milk was taken by 81.61%, milk by 66.67%, and curds by 57.41%. About 27.59% of patients preferred to take sweets daily in their ration, ice-creams by

9.19%, cheese by 14.94% and butter by 8.05%. When history regarding habits and addictions was taken; it was found that 24.14% chewed tobacco and beetle leaf while 2.30% had the habit of alcohol intake.

Lifestyle observations

Proper exercise was in practice in only 21.84%. In this study, 14.94% did workout on a regular basis, and 17.24% exercised occasionally, 67.82% did not do any kind of workout at all. 20.69% of people did some kind of exercise which was inadequate, while 16.09% exercised more than required. As far as the relaxing time was concerned, 47.13% took a break much more than needed, appropriate rest was seen in further 11.49% relaxing time was inadequate. 56.32% led pleasant sexual life whereas 32.18% were not happy with their sexual life. Remaining 11.49% were not agreeable to disclose anything regarding their sexual life.

Quality of sleep was reported to be fine and appropriate in 68.97%, improper in 31.03%. Sleep was found to be excess in 36.78% while about 10.34% had distressed/disturbed sleep. Maximum patients (80.46%) in this study had the habit of regular afternoon sleep of which 24.29% slept for more than 2 hours. In the same way, about 45.98% slept for more than 8 hours in night time whereas 9.20% slept for less than 6 hours /night. Majority led a sedentary lifestyle. The line of profession required moderate work in 31.03%, while heavy work was seen in only 9.20%. 44.83% of people were psychologically stressed and found to be mentally tense. another 44.83% were psychologically inactive and remaining 10.34% showed extremely pleasant mental status.

Highly sensitive bowel habits were seen in 9.20%, while it was medium sensitive in major part i.e. about 62.07% of total study population. Remaining 28.74% had hard bowel habits. Excessive and frequent urination was present in 11.49%, 5.75% were passing turbid urine, and burning micturition was observed in 3.45%. Urination process was not

satisfactory in 2.30% .Rest of the patients (85.06%) had normal urination.

Out of 56 female patients who came under this study; 94.64% attained their menarche between the ages of 10-15 yrs. The remaining had 5.36% menarche between 16-20yrs. 60.71% of these female patients were still in their fertile period, 19.64% attained menopause between 35-45yrs, another 19.64% reached menopause between 46-55yrs. Menstrual histories also revealed the nature of irregular periods in 48.21%, painful bleeding in 58.93%, scanty blood flow in 42.86%, and heavy flow in 12.5% of females. In about nearly 18%, history of abortion / miscarriage was noted.

Examination findings

In regard to physical constitution, Pitta pradhana kapha prakriti was more (35.63%) followed by Vata-kapha (27.59%) kind of constitution. In manasa prakriti satva-tama and raja-tama people were more (37.93% in each category). Vikriti bala was either pravara (25.29%) or madhyama (74.71%) in the current study population.

Sara pariksha provided madhyama result in 85.06% and avara in 14.94%. At the same time, 67.82% had heena pramana and it was madhyama in 32.18%. The compactness of the body was madhyama in 56.32% and avara in the rest. Satva-the mental power to tolerate the brutality of the illness was madhyama in 58.62%, avara in 33.33% and pravara in 8.05%. Nearly 62% of the subjects were accustomed to more than one or two rasa, while 22.98% were adapted to only one rasa; 3.45% were familiar with all the six rasa. The physical strength to carry out demanding works was avara in maximum number of patients (67.82%, 31.03% had madhyama vyayama shakti and 1.15% had pravara. The abhyavaharana shakti which can be assessed by the quantity/amount of food stuff taken was madhyama in 47.13% and pravara in 37.93%. About 3.45% had poor intake capability. The power to assimilate the taken food was madhyama in 54.02%, pravara in 40.22%, and avara in 5.75%. Vaya (age

classification) was in madhyama category for all 100% of patients.

Scrutiny of etiological factors illustrated the role of 1) aharaja nidana-(causes related to dietetics) in 67.82%, 2) viharaja-life fashion factors (86.21%), 3) manasika-psychological grounds (56.32%), 4) beejdushti-genetic and hereditary roots (73.56%), 5) vyadhi vishesha-association of other disorders which can lead to kapha medo margavarana (43.68%).

As a component of evaluation of samprapti, pathophysiological factors involved in each case of kapha medo margavarana were also examined. Kapha vridhi lakshana were present in 88.56%, kshaya of kapha dosha in 3.45%, morbidity of the same in 39.08%. Signs and symptoms of pitta vridhi were seen in 52.87% and prakopa in 9.20%. Vata vridhi observed in 48.28%; vata prakopa in 27.59%. Among the sapta dhatus and related srotas, rasa kshaya observed in 3.45% and morbidity of rasa vaha srotas in 72.41%.

Channels carrying rakta dhatu were affected only in 3.45%. Mamsa vridhi lakshana observed in 36.78% and kshaya in only 1.15%. Morbidity of medo dhatu was seen in about greatest of (90.80%) and sroto dushti in 57.47%. Asthi kshaya symptoms were present with 41.38% and srotodushti in 4.60%. Majja kshaya in about 26.44% and vridhi in 13.79%. Out of 31 male patients in the study, 3.23% had shukra dhatu kshaya lakshana and shukra vaha sroto dushti lakshana were seen in 22.58%.

Coming to the trimala, 39.08% people had the symptoms related to sweda vridhi and 34.48% with sweda vaha srotodushti. Purisha vaha srotodushti lakshana was seen in 26.44% and 3.45% showed symptoms of purisha vridhi. Mootra vaha srotodushti was seen in about 17.24%. Udaka vaha srotas morbidity was seen in 19.54%, 5.75% presented with symptoms of annavaha sroto dushti. In about 18.39% ojo visramsa lakshana were present, kshaya lakshana in 34.48% and vyapat in 6.90%. Important observation obtained through ashta vidha pariksha included mootra vaikrita in- 17.24%, mala vikriti in 32.18%, vaikruta akriti in 63.22%.

DISCUSSION

Majority of the subjects were females. But on the mere basis of this finding, it is not possible to conclude that women are getting more affected with the condition of kapha medo margavarana. The ground for greater number of female patients in the study can be more probably due to better awareness among females about their body status than male, which makes them seek hospital prescription³. Moreover the study sample is taken from those patients who visited the OPD of IPGT&RA, GAU, Jamnagar. As per the hospital records female ratio of patients who took OPD treatment was much more during the study period⁴.

Regarding age prevalence, hyperlipidemia is unquestionably a metabolic aberration which happens to be more and more obvious as the age advances. Even though the condition does not present with any precise symptoms, it acts as a risk factor for a number of other pathological conditions, namely atherosclerosis, CVD etc. The pathophysiology involved in the present stipulation is avarana, and when the development of encapsulation and consequential blockage progresses, vata gets sternly morbid resulting in manifestation of vatavyadhi, which is particularly dominating in the elder by population. Perhaps this may be the reason that more patients in this study belonged to advanced age categories.

People following Hindu ethnicity and beliefs dominated this study. But the interpretation that people from Hindu community are more prone to develop kapha medo margavarana will be biased, as the prevalence of Hindu population in the present study is due to the majority of Hindus in the general population of Jamnagar vicinity/Gujarat. But the lifestyle prototype and food trend followed by certain communities from centuries can be the basis for prevalence of dyslipidemia and similar conditions in the same societies.

Likewise, the study consisted of more married people than single. However, matrimonial status is neither an etiological

factor nor a risk factor of hyperlipidemia. But the surplus stress and burden suffered in marital life by many people can promote accelerated aging leading to early occurrence of features of kapha medo margavarana⁵.

Educational status is a prime milestone for excellence and standard of any living population. In this survey; most of the people had good educational status. There is no evidence based relation between educational status and incidence of lipid abnormalities. The awareness of health or ill health status will more likely be seen among educated people. After all, conditions like hypercholesterolemia came into the notice of general public only source the last few decades. Most of the illiterate people are ignorant that it is a state which needs medical intervention. This can be the reason for the presence of more number of educated people in this study. Highly educated people usually live in rich environments and have sedentary living are or engaged in white collar jobs.

Major proportion of the subjects was housewives by vocation irrespective of their educational status. This is a general demographic outline of numerous studies conducted in most parts of the country (India) in which females make up the maximum subjects. The deskbound living pattern among housewives can endorse the abnormality of pathophysiological factors of kapha medo margavarana. Classics consider inactive lifestyle as a risk factor for the development of many illnesses caused by kapha and meda. Middle and upper middle class citizens were more in the study. Again, awareness, lifestyle modes, diet-related sources etc can be the cause for this.

The mean BMI of the survey population was much higher than the normal standards, and many of them were morbidly obese. In a survey study conducted in Ayub Medical College Pakistan, it has been concluded that there is increase in dyslipidemia trend with increase in BMI and age. It can be recognized that obesity is in linear relation with dyslipidemia⁶.

In the same way, as per texts, Sthaulya is multifactorial multifaceted and chronic disease in which excessive accumulation of aberrant medo dhatu occurs in specific body depots resulting in overweight and obesity. Etiological factors point towards the significant role of morbid kapha and meda in the manifestation of this illness. It is not a hard and fast rule that the pathology of kapha medo margavarana must always been aligned with overweight and obesity. The condition can remain asymptomatic may show other features related to kapha and medo dushti, or, in chronic stage, may express with vata vridhi lakshana.

In the present work, none of the subjects were asymptomatic; every patient was presenting with some or other features cited below. Gaining weight was the most common grievance observed in maximum number of patients. The reason for the same is already been explained.

Dourbalya and sandisoola were the other two extensively observed complaints. Both are the features of morbid vata. Staulya associated with most of the cases can be a reason for pain in major weight bearing joints and general weakness. When the etiological factors are in favor of kapha and medo vridhi, other dhatu, especially that of asthi (bones) which comes after medas, are not getting enough nutritional requirements. Further the blockage formed in bio-transforming channels vitiates vata. All these finally result in asthi kshaya and ojo kshaya etc, leading to the onset of daurbalya and sandisoola.

Feeling of heaviness of body, laziness, excess sleep etc are the typical features of morbid kapha and medas. Both kapha and medas possess the quality of guru, so excess formation and accumulation of the same leads to guruta of sharira. Inactiveness/inertness is a result of this kapha vridhi where a person loses interest in work. Sleep dominates with the bhava of tamas and kapha and excessive sleepiness in patients of kapha medo margavarana can be considered as vaikarika/doshaja nidra. Sleep is a state that helps in energy preservation; nearly all voluntary

muscles are in a state of inactiveness during sleep. Since the metabolic energy does not meet the required amount needed for physical and mental activities, the patient may tend to sleep more to decrease metabolic energy consumption.

Sweda is a metabolic waste product of medas. When the metabolism of medo dhatu gets impaired, there is excessive formation of waste products also. This leads to undue sweating. When there is abnormal accumulation of unwanted waste minerals in the body, the sweat glands have to work more to remove these waste products. Kleda is an apya substance, e.g. body fluids present inside and outside the body cells⁷. Increased fluidity of kapha and looseness of meda can cause abnormal elevation in the levels of kleda. In normal situations sweda maintains the normal kleda bhava in the body as it is necessary for retaining sneha / snigdhatta in the skin and also to uphold body and scalp hairs⁸. When kleda is produced in excess then there is atipravritti of sweda vaha srotas resulting in swedadhikya. Polyphagia and polydypsia are the other two complaints by many of the patients. Due to the functioning hypo of dhatwagni, tissues do not get enough energy for the proper functioning, which makes the digestive fire to become active over, to achieve more energy from the food stuff. As a result of this patients present with increased appetite and thirst.

Dyspnoea results when the need for ventilation is not met with the physical breathing. The proper physical breathing requires appropriate functioning of diaphragm, external and internal intercostal muscles, abdominal muscles and accessory muscles. If the level of respiration is inadequate then dyspnoea may occur. Dyslipidemic patients usually suffer with dyspnoea on exertion when the condition is associated with obesity or vascular cardio abnormalities. Usually this sensation of air hunger is related to insufficient tissue oxygenation by the blood.

The formation and evolution of kaphamedo margavarana is always a slow process. Long term indulgence in factors promoting kapha

and medas causes unusual and undue buildup of the above two in channels of physiology, mainly in rasa and rakta vaha srotas (ama). As long as etiological factors are ongoing, the progression of this accumulation also continues to develop. There will be sudden and dramatic onset of symptoms only in those cases in which inclusive occlusion occurs. In the present study, maximum percentage of people had slow start, gradual progression and history of 1-5 yrs chronicity.

Hypertension, obesity, diabetes mellitus, renal disorders, peripheral vascular disorders, cardiovascular diseases and dyslipidemia are closely linked conditions. Most of the time one acts as a risk factor for other. The situation where most of the said above pathological conditions presents together (metabolic syndrome) is also becoming high in prevalence. It is the same margavarana which results in raktaja mada (hypertension), sthaulya, apathyanimittaja prameha, vata rakta and hridroga. So the existence of one or more these pathological conditions together is justified.

Familial history of dyslipidemia/obesity/diabetes mellitus/hypertension was present in major fraction of the study populace. On the basis of these findings, it can be accomplished that genetics plays one of the most important roles in the manifestation of all these disorders. Kulaja vikara are said to be asadhya. In persons where the hereditary tendency of aberration in kapha and meda are present, the conditions are considered as mostly incurable.

Both the appetite and digestive capacity was relatively high in a good number of patients. It is now established that to maintain required energy level of the fat stores, obese people eat more than average. The total daily energy expenditure is higher in obese than lean individuals⁹. Even though most of the individuals follow a strict vegetarian diet it is not going to give a beneficial effect in hyperlipidemia, as the food is highly rich in carbohydrate and prepared with oils containing saturated fats. Excess intake of madhura rasa,snigdha – guru-sheeta dravya straight away leads to kapha and medo dushti.

Food articles that are heavy in quality and at the same time work as atarpana (producing early satiety,delayed hunger onset and of less calorie) are the typical choice in the management of kapha-medo margavarana. On the other hand, articles which are heavy both in quality and quantity, highly fatty, cool in potency, needless to say, will act as triggering factors of kapha medo margavarana. Faulty methods of in food intake are equally responsible for the improper digestion and impaired assimilation. Adhyasana (eating over and frequent intake), samasana (addition of pathya and apathya together), irregularity were some of the improper dietetic patterns observed in the study group. Coping up with these irregular patterns of food ingestion is always a dispute for the metabolic fire.

Wheat, rice and dal products were the most dominating staple food in this part of locality. Root tubers like potatoes which are prepared by various cooking methods are used in a wide number of dishes. All these eatables are mainly carbohydrate and vegetable protein rich. One of the studies conducted in the U.S concluded that high intake of vegetable protein from gluten may have beneficial effects on vascular cardio disease risk by reducing oxidized LDL, serum triglycerol , and uric acid¹⁰.Green leafy vegetables were a part of food in major part of the study populace. These are low in calorie and high in vegetable fiber so definitely help in reducing high cholesterol levels. But, again, there can be drastic differences in qualities of a substance when they are used raw and when cooked. The cooking method followed also, to a great extent, decides the property of a food article.

The glycemic index of banana is very high and large intake of banana can raise both blood sugar and blood fat levels. It is now believed that due to presence of high level of soluble dietary fiber, pectin and vitamin C, mangoes may be helpful in lowering serum cholesterol, specifically LDL cholesterol¹¹. But this claiming of beneficiary effect of mango in blood fat levels needs to be evaluated further.

Another major finding in the study was high usage of deep fried food stuffs which are extremely unhealthy. It is an established fact that constant frying in same oils/fats can release toxic substances. Deep fried articles being heavy can also hamper the metabolic fire can cause formation of ama, both in the level of digestive fire and cellular plane (free radicals).

Cotton seed/groundnut / and sunflower were commonly used kitchen oils by this study group. All vegetable oils contain 100% fat, and most of them have saturated fats. So, though oils are advertised to have beneficiary effects on health, regular and excess intake will produce harmful effects rather than good. After all, cotton does not come under the category of food crops so the use of cotton seed oil in a wide range for cooking purpose is also dubious.

In regard to the consumption of meat, intake of large quantities of meat, no matter whether it is white or red beyond doubt, has unfavorable effects of high blood cholesterol, obesity, heart disease etc. But, in general, white meat is considered comparatively safer than red meat. Because of high content of saturated fat, red meat intake is associated with cardiovascular diseases and increased risk of type 2 diabetes.

Cholesterol content present in milk and milk products is very high except butter milk (fat removed). Milk and milk products have snigdha, guru and sheeta guna .So the consumption of these articles continuously and for a long time will have adverse effect on cholesterol levels. Recent invitro studies have shown that butter milk has strong inhibitory effect on cholesterol micelle solubility¹². It has been reported that terpenes, a type of oil present in coffee, can cause marked increase in level of LDL and total cholesterol counts¹³. The habit of frequent and continuous intake of drinks like tea, coffee or aerated drinks are not beneficial for health and will certainly hamper the normal performance of agni.

The most common effect of alcohol on plasma lipid levels is to increase plasma

triglyceride. The qualities of madhya are quite contradictory to ojas and sapta dhatu and, for the same reason, habitual usage leads to diminution in dhatu level. Oestrogen therapies can increase VLDL levels and tobacco leads to reduction in HDL levels¹⁴.

From the lifestyle pattern of study subjects, it is clear and evident that most of them followed a deskbound standard of living. Less physical strain, insufficient or lack of exercise, more time spent on leisure and sleep were the broad patterns observed. All these are triggering risk factors for dyslipidemia. Excess calorie intake and reduced burning of energy is the major cause for kapha medo vridhi and its excessive accumulation.

Overall psychological assessment revealed stressful living conditions in many of the subjects. Both atichintana and achintana can make a person inert/inactive. This dullness of mind has a direct impact on body which makes the person inert.

Many of the study subjects were suffering with hard stools and constipation. This can be measured as vata vridhi lakshana. The main function of mootra is to drive out the excess kleda from the body .The abnormal accumulation of kapha and medas is nothing but the kleda vridhi, and for eliminating these wastes from the body, frequent and excessive urination is needed. Avila and prabhuta mootrata observed in some patients can thus be justified. A portion of the study subjects was also suffering with diabetes mellitus. Due to this reason also, medo dushti, sthana samsraya of dosha in basti, creation of excessive kleda and involvement of mootravaha srotas can take place.

Acharya Sushruta in the context of prameha has opined that as long as there is proper menstruation females are not going to suffer with unfavorable effects of prameha¹⁵. The recent research works done in this field also follow in the same line. Female hormones play a significant role in prevention of a major number of systemic and metabolic disorders. The raising of blood fat levels is controllable in females when they are in the fertile period even though age increases. But

once menopause is attained, there are dramatic changes in the hormonal level and the same has a negative impact on cholesterol levels also. Menstrual irregularities and problems like scanty bleeding in many females need further evaluation for scrutiny of the cause. But, overall it is not a good sign of healthy physiology. Artava is considered as the upadhatu of rasa. Major part of the study populace suffered from medo dushti and staulya. Both rasa and rasa vaha srotas are involved in the pathogenesis of medo dushti. So, the affliction of artava in pathogenesis of medo dushti is also common in such patients. While explaining the etio-pathology of Sthaulya, the role of shukra and artava is also been specified¹⁶ these impairment in the normal functioning of shukra and artava can be authenticated. Further, though this study did not go into the depth for complaints like unsatisfactory sexual life, disharmony in menstrual cycle, history of miscarriage and abortion, the said above reasoning cannot be completely ruled out.

Kapha was either the core or the allied dosha in the prakriti of most of the subjects. So it can be interpreted that kapha dominated prakriti persons have more tendency to develop the manifestations caused by kapha-medo margavarana. In the same way, the dominant tamo bhava in majority of the patients showed the inert nature of these subjects. Vikriti bala was pravara mainly in such patients where multiple etiologies and all the three dosha are involved. The examination findings revealed the bala of patients like dhatu sara, samhanana etc were either heena or madhyama in maximum number of subjects. Since the condition of kapha medo margavarana is a chronic one the long course has declined the bala of persons. As the major number of subjects were obese the pramana was recorded as avara.

CONCLUSION

Kapha medo margavarana is a unique pathological concept of Ayurveda observed widely in association with the

pathophysiology of multiple numbers of disorders. Multifactorial risk factors like genetic, environmental, age, diet, and lifestyle play a vital role in deciding the incidence and development of this disorder. Though slow in onset and progression, the end stage of this metabolic impairment is frequently deplorable and irreparable. By firm by following healthy dietetics, physically and psychologically active lifestyle the situation of kapha medo margavarana can be modified to a greater degree.

REFERENCE

1. Hari Sharma Leaky gut syndrome -dysbiosis - ama-free radicals and natural antioxidants. *AYU* 2009; 30(2): 93.
2. Agnivesa's Charaka Samhita Revised by Charaka and Dridhabala with Ayurveda - Dipika commentary of Chakrapanidatta, Edited by Vaidya Jadavji Trikamji Acharya ,5th edition. *Chikitsa Sthana* 2001, reprint 2004; , 29(156): 634.
3. Margaret McDonald, Robin P Hertz, Alan N Unger and Michael B Lustik Prevalence, awareness, and management of hypertension, dyslipidemia and diabetes among United States adults aged 65 and older. *Journal of Gerontology: Medical sciences* 2009; 64A(2): 256-263.
4. *Hospital records of OPD registration*. IPGT & RA , Gujarat Ayurved University, April 2010 to March 2011.
5. Nilsson P.M, Nilson J A, Ostergren P O, Berglund G "Social mobility, marital status, and mortality risk in an adult life course perspective" The Malmo preventive project. *Online journal- Scan J Public Health* 2005; 33(6): 412-23.
6. Anjum Humayun, Arbab Sher Shah, Shamin Alam, Hamid Hussein, Relationship of body mass index and dyslipidemia in different age groups of male and female population of Peshawar. *Ayub Medical College, Abbottabad , Pakistan. J Ayub Med Coll* 2009; 21(21).
7. *Diabetes- Pramesh*. Edited by Dr. T.D Damodaran Unni, First edition. Trivandrum; Vasudeva Vilasam Publications, 1982; 166.
8. Vagbhata's Ashtanga Hridayam, With Sarvanga Sundara commentary of Arunadatta and Ayurveda Rasayana of Hemadri, Edited by Pt. Bhisagacharya Harishastri Paradkar Vaidya,

- Varanasi, Chaukambha orientalia, 9th edition. *Shareera Sthana* 2002; 3(84): 956, 402
9. Jeffrey S. Flier / Eleftheria Maratos-Flier. *Obesity*. In Kasper, Braunwald, Fauci et al Harrison's Principles of Internal Medicine, 16th edition. New York; McGraw-Hill Medical publishing division, 2005.
 10. David JA Jenkins, Cyril WC Kendall, Edward Vidgen et al High-protein diets in Hyperlipidemia: Effect of Wheat Gluten on Serum Lipids, Uric Acid and Renal Function; Original research communication. *American Journal of Clinical Nutrition* 2001; 74(1): 57-63.
 11. <http://www.healthmango.com/health-benefits-of-mango.html>. accessed on 11/07/11 at 9.30 pm.
 12. *Impact of buttermilk in cholesterol concentration and homeostasis (BMILK)*. Institute of Nutraceutical and Functional Foods (INAF). Canada; Laval University.
 13. <http://www.coffeecrew.com/culture/food/280-coffee-and-cholesterol?format=pdf>. Accessed on 13/7/11 at 10pm.
 14. Daniel J.Reader / Helen H Hobbs. *Disorders of Lipoprotein metabolism*. In Kasper, Braunwald, Fauci et al Harrison's Principles of Internal Medicine, 16th edition. New York; McGraw-Hill Medical publishing division, 2005.
 15. Sushruta's Sushruta Samhita with Nyaya Chandrika Panjika. *Commentary of Gayadasa Acharya*, Edited by Jadavji Trikamji Acharya and the rest, 8th edition. Varanasi; Chaukambha Orientalia, 2005; 1(1): 289.
 16. Agnivesa's Charaka Samhita, revised by Charaka and Dridhabala with Ayurveda - Dipika. *Commentary of Chakrapanidatta*, Edited by Vaidya Jadavji Trikamji Acharya, 5th edition. Sutra Sthana 2001, reprint 2004; 21(4): 116.