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A CLINICAL STUDY TO EVALUATE COMBINED EFFICACY OF VIRECHANA KARMA FOLLOWED BY VACHADI KASHAYA IN THE MANAGEMENT OF RASARAKTAGATA SNEHAVRUDDHI WITH SPECIAL REFERENCE TO HYPERTRIGLYCERIDEMIA

Dr. Meenakshi Rewdkar Kole* and Dr. Tejal Mokal

Associate Professor, (B. A. M. S, M. D Kayachikitsa Department), R. A. Podar Medical College, Worli, Mumbai – 18.

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***Corresponding Author**
Dr. Meenakshi Rewdkar Kole
Associate Professor, (B. A. M. S, M. D Kayachikitsa Department), R. A. Podar Medical College, Worli, Mumbai – 18.

ABSTRACT

The relative impact of infectious diseases is decreasing while chronic diseases like cardiovascular diseases, diabetes mellitus, hypothyroidism, etc., are increasingly dominating the disease pattern. Change in lifestyle resulted in disturbed metabolism of body or Agni which in turn invites diseases like Hypertriglyceridemia, Diabetes Mellitus, Hypertension, Hypothyroidism, Coronary Vascular disease etc. When patient having Agnimandya consumes Madhura, Guru, Snigdha, Picchil, Abhishyandi diet, the Rasa which is formed from it also becomes of same property. So the Sneha increases in Rasa and Rakta as well, as there is Sahacharya of both dhatus. So this further causes Dhamani Pratichaya, one of the Kaphaj Nanatmaj Vyadhi which is nothing but the complication of Hypertriglyceridemia. It creates symptoms like Shwas, Gaurav, Aalasya, Swedatipravrutti. If pathology continues to grow, it can create complications like Heart diseases, Hypertension, Obesity.

A open, prospective, randomised study was done with sample size of 30. Patients having triglyceride levels between 150-400 mg/dl and having symptoms like Alasya, Gaurav, Nidradhikya, Shwasa were taken into study entitled as A clinical study to evaluate combined efficacy of Virechana karma followed by Vachadi kashaya in the management of Rasaraktagata snehavruddhi with special reference to Hypertriglyceridemia. Virechana karma was given to the patients along with poorva karma, pradhana karma and paschata karma procedures for appx 15-20 days. After that Vachadi kashaya was given for 2 months. Lipid

profile of patient was done before and after treatment. Fasting Serum Triglyceride levels reduced by 101.47 ± 36.935, the p value is < 0.0001 which indicates statistically extremely significant. Value of t is 15.047.

KEYWORDS: Hypertriglyceridemia, Rasaraktagata snehavruddhi, Virechana karma, Vachadi Kashaya.

INTRODUCTION

Today is the world of globalisation. People are getting more civilised which resulted in change in their life styles. Fast food, irregular food habits, neglecting of natural urges, lack of proper sleep and having more relaxing lifestyle, junk food habits etc. have resulted in disturbed metabolism of body or Agni which in turn invites diseases like Hypertriglyceridemia, Diabetes Mellitus, Hypertension, Hypothyroidism, Coronary Vascular disease etc. The above emerging "Lifestyle Disorders" are leading to major cause of deaths in recent years.

Hypertriglyceridemia is defined as an abnormal concentration of triglycerides in blood, resulted from a disorder of lipoprotein metabolism. As per National Cholesterol Education Program Adult Treatment Panel (NCEP ATP III) guidelines, a normal triglyceride level is 150mg/dl. In India prevalence of triglycerides level >150mg/dl is 3.4% and incidences are increasing every year. Even though, Hypertriglyceridemia is essentially asymptomatic, it is identified as a potential risk factor for various diseases like Coronary Heart Disease (CHD), Cerebrovascular accidents (CVA), metabolic syndromes and atherosclerosis.

Hypertriglyceridemia is prevalent in 18.6% of men and 4.2% of women between 16 and 65 years of age. High triglyceride levels are associated with a collection of disorders known as metabolic syndrome and also has increased risk of developing diabetes, atherosclerosis and by extension, the risk of stroke and heart disease. These are grouped under chronic non communicable diseases, and are caused due to genetic predisposition, stress, unhealthy food habits, addictions and sedentary life styles. These diseases are increasing rapidly in developing countries and also becoming responsible for the cause of high rates of morbidity and mortality. Extreme high levels of triglycerides cause inflammation of pancreas, fatty liver, Xanthomas, lipemia retinalis and chylomicron syndrome.

In epidemiologic and interventional studies, Hypertriglyceridemia is a risk factor for

Coronary Artery Disease. The National Cholesterol Education Program (NCEP) opines, Triglycerides to be an independent risk factor for coronary heart disease (CHD), even after adjustment for High density lipoproteins (HDL) and low density lipoproteins (LDL).CHD is the number one killer among the diseases. In India persons who are suffering from CHD are doubled in the past last 20 years. The Global Burden of Disease study estimate of age-standardized Cardiovascular disorders death rate of 272/100000 population in India is higher than the global average of 235 per 100000 population.

In western system of medicine, management of elevated serum triglycerides include both dietary management and drug therapy. Dietary management includes fat modified diet, reduced intake of red meat, dairy products and refined sugar, increased intake of vegetables, fruits, pulses and sources of proteins, increased physical activity –aerobic excercise, avoidance of cigarette smoking, alcohol and increased dietary fibre intake. Drug therapy includes lipid lowering drugs like statins, niacin and fenofibrates which give rapid relief but long term side effects such as hepatic or renal impairment, malaise, hyperglycemia, constipation, nausea, diarrhoea, gallstones, myositis and Liver enzyme elevation. Most of these lipid lowering drugs are contraindicated in patients with Chronic liver disease, severe renal failure, gout and gall bladder disease.

During past few decades there has been extensive research carried out in this regard and effective drugs have been put forth. The causative factor for Hypertriglyceridemia is excessive consumption of diet which is predominant in properties like Madhura, Guru, Snigdha, Picchil, Abhishyandi. When the patient having Agnimandya consumes food particles with above mentioned properties then the Rasa which is formed from it also become of that gunas like Madhura, Guru, Snigdha, Picchil. So the Sneha increases in Rasa and Rakta as well, as there is Sahacharya of both dhatus. So this further causes Dhamani Pratichaya, one of the Kaphaj Nanatmaj Vyadhi which is nothing but the complication of Hypertriglyceridemia. It creates symptoms like Shwas, Gaurav, Aalasya, Swedatipravrutti. If pathology continues to grow, it can create complications like Heart diseases, Hypertension, Obesity.

Ayurvedic herbal medicines are multitargated and act without much adverse drug reaction. Shodhan therapy in Ayurveda thoroughly cleanses the body from toxic materials and achieves balance and longeivity. Virechana i.e. one of shodhan type helps to purify disturbance in the process of metabolism. It removes the vitiliated doshas from strotasa and

helps in stotasa shodhana. Thus metabolism is corrected through dhatwagnideepan at microlevel. Also dravyas like Trikatu, Vacha, Chitrak, Shigrubeej, Kutaki and Karanj are ushna-tikshna, kaphomedohara, Deepan, Pachan properties which may help in reducing elevated triglycerides.

Hypertriglyceridemia is usually due to deranged digestion and metabolism. Hence taking above in consideration Virechana karma followed by Vachadi kashaya acting on metabolism and microcirculation was selected in the management of Rasaraktagata snehavruddhi with special reference to Hypertriglyceridemia.

Review of Literature

Comparison of Hypertriglyceridemia and Rasa Raktagata Snehovruddhi With Ayurveda.

1. **On dosha level**

Structuraly: Triglycerides on the basis of its properties show resemblance with kapha dosha (kledakakapha) with dushti of pachak Pitta.

2. **On mahabhutas level**

Three Mahabhutas constitutes in their formation. Structuraly it is - Parthiva and Aapya and functionally it is – Aagneya.

3. **On dhatu level**

Rasa and Rakta Dhatu: These triglycerides circulate through Rasa- Raktavahinis and therefore while considering Triglycerides, we should keep in mind about Rasa and Rakta Dhatu. Triglycerides are mainly formed and stored in Liver. Liver is the moolasthana of Raktavaha strotasa.

4. **On srotas level**

Rasa and Raktavah Srotas In consideration about its metabolism, one should give importance to blood also. Because blood is the medium through which lipids are transferred from GIT to liver and from liver to the cells.

Role of Agni

1. Agni has an important role in the physiology as well as pathology too.
2. While considering physiology- acharya Charaka says “The life span, complexion, vitality, good health, enthusiasm, plumpness, glow, vital essence, lusture, heat and the life breaths are derived from the thermogenic process.”

3. But as we are talking about "hypertriglyceridemia" one should think about its deformity in the lipid metabolism. The action of Agni on lipid metabolism occurs at three different levels.

A. Jatharagni level

Jatharagni digests the ingested food material. Different gastric secretions, pancreatic juices, bile secretions from the liver, intestinal secretions help in this process. This means Jatharagni is related with stomach, pancreas, liver and intestine etc. Sthoolapachana of Ahara is done Jatharagni.

B. Bhutagni level

Bhutagni do their functions in two ways: Firstly they distribute the absorbed material according to their constitution. Secondly, just as a quality in the substances, nourishes individually its corresponding quality in the body. Each Agni for the separate constituent digests the corresponding component. The function taking place in the liver is just similar to this. Liver accepts the absorbed material from the intestine. In the liver cells, different constituents (similar to protoelements) are then processed through different chemical reactions. The hepatic cells process the fats, proteins, carbohydrates, vitamins, minerals to convert them into the components which will be in the useful form to them and accepted by the cells.

Regarding hypertriglyceridemia: Triglycerides are synthesized mainly from the carbohydrates and other lipids like cholesterol and phospholipids are synthesized from the fatty acids. Lipoproteins like VLDL, LDL, IDL, HDL are major carriers of triglycerides. The dehydrogenase in the liver cells has more capability of desaturating the triglycerides than the other cells because many of the structural members of all the cells have reasonable quantities of unsaturated fats and their principle source is liver. Therefore any abnormality at the Bhutagni level in the liver can lead to the hypertriglyceridemia.

C. Dhatvagni level

The Ahara Rasa goes to every Dhatu and processed by Dhatvagni which converts it into the Sthayi Poshya Dhatu. Dhatwagni is related to Sookshmapachana. Considering lipid transportation, after processed by Parthivagni, Aapyagni and Aagneyagni it is converted into triglycerides, cholesterol and various compounds. It is transported with the help of lipoprotein like LDL, HDL and VLDL. VLDL – carries triglycerides from liver to adipose tissues and

after deposing triglycerides in the adipose cells, VLDL is converted into LDL. LDL – carries cholesterol from liver to tissues. HDL- carries excess cholesterol from body cells to liver to remove it.

Before analysis of the results obtained in the present study it would be essential to briefly summarize different steps involved in lipoprotein metabolism, which is very important for the regulation of lipid levels in the blood. Chylomicrons the largest of the lipoproteins are mainly involved in the transport of triglycerides of dietary origin and are formed in the intestine. Triglycerides are removed from the chylomicrons in different tissue through a reaction involving hydrolysis by the enzyme called lipoprotein lipase. Thus the VLDL formed in the liver acts as a vehicle for the transport of triglycerides to different parts of the body. After the removal of triglycerides, the VLDL remnant gets converted to IDL. Part of the remnant is converted to LDL by removing the further amount of triglycerides. LDL is catabolized in the hepatocytes by the hydrolysis of cholesteryl ester in its core. This cholesterol is utilized in the preparation of cell membranes.

Samprapti of Rasa RaktagataSnehovriddhi

(Sukshma chayapachaya janya)

↓

Hetusevan

(Madhur; Guru; Sheeta; Snigdha gunayukta Ahara adhika sevan)

↓

Jatharagni mandya- Kaphadosha pradhana

↓

(sthoola pachan vikruti) Ahara Rasa formed is more Madhur, Guru, Snigdha,

And Sheeta in Nature

↓

Rasadhatu Poshakasha ↙ ↓ ↘ Rasa Mala that is Kapha

↓ Rakta dhatu Poshakansha

↓ ↓

Rasa dhatu is formed which contains

More Pichhilitva and Styanatva via

Kedar Kulya Nyay

↓

Likewise; for Rakta dhatu also there is RasaRaktasahacharya

↓

Manda guna of Kapha increases causing Mandatva in Gati

of Rasa and Rakta

Strotodushti in form of Sanga occurs

↓

Due to gradual Sanga and manda gati, the Upalep of Ati snigdha Rasa

Dhatu occurs in Rasayani that is RasaRakta Vahi Sira

↓

Rasa Raktagata Snehovruddhi

↓

Kapha upalep as it is mala of Rasa Dhatu

Which also gets vitiated; Dhmani Pratichaya

MATERIAL AND METHODS

Type of study: Prospective, Open, Clinical Study.

Number of Patients: Total number of patients 30.

Drug: For Virechanartha Snehapana –Goghruta.

For Virechana Karma, Yoga-Trivrutta and Madanphala choorna with Triphala kwatha and Eranda Sneha was used.

Trial Drug –Vacha, Trikatu, Chitrak, Karanja, Kutaki, Shigrubeej siddha Kashaya 30cc, twice a day.

METHODS OF PREPARATIONS

Virechana Karma

- **Poorvakarma**

  Aarohana Snehapanawas given in Sarvadehik Niramavastha with Goghruta for 3-7 days until Snehasiddhi Lakshana occurred.

  Abhyanga was done with Tila Taila for 15-30 minutes followed by Nadi Swedana for 3 days after Snehapana.

- **Pradhana Karma**

  Virechana karma was done with following Kalpa. Approximate quantity of each drug was as follows -

Sr. No	Drug	Quantity
1.	Trivruttachoorna	5gms
2.	Madanphalachoorna	2.5gms
3.	Triphala kwatha	80ml
4.	Erandasneha	20ml

(Final dose was decided accordingly to koshta and agni of patient.)

- **PaschataKarma**

  Sansarjana krama was given depending on shuddhiprakara for 3-7 days.

Trial Drug

Vachadi kashaya was given just after completion of sansarjana krama. Vachadi kashaya was prepared as per the classical methods of preparation of kwatha mentioned in Sharangdhar Samhita. Complete procedure of preparation is as follows.

One part Bharadchoorna (Vacha, Chitrak, Kutaki, Karanja, Shigrubeej, Marich, Pippali, Shunthi each 2gms in quantity) is taken and 16 part of water (240 ml) is then added in it. Then whole mixture is boiled until 1/8th of it remains (30ml). Then it is filtered to use.

Dose: Vachadi kashaya 30ml twice a day.
Abhakta (i.e. on empty stomach in morning) and Pragbhakta kale at evening.

Duration: Two months (for kwatha sevan).
Total duration of study was appx. maximum of 70-80 days.

Diet: Regular as per patient's previous schedule but not with too much oily, sweet, fried or non veg food.

Follow up: Clinically patient was screened before and after virechana karma and every fifteen days for two months after virechana karma.

Clinical Examination: Complete clinical examination was done to diagnose and assess the condition of patient.

Diagnostic Criteria: Serum Triglycerides 150-400 mg/dl (all borderline to high value)

Investigations

1. Blood CBC, ESR, weight, Urine routine and microscopic, Liver function test, Renal function test had done before treatment as routine to rule out other pathology.
2. Lipid profile, BSL Fasting and PP, before and after treatment.

Inclusion Criteria

- Both sexes
- Age between 18-70 years age group.
- Patients having DM (type 2), Hypertensive patients, Hypothyroid patients without any complications.
- Early alcoholic hepatitis without any complications
- Patients having LDL level < 150 mg/dl.
- Patients having HDL level < 60 mg/dl.
- Patients having Total cholesterol < 300 mg/dl.
- Patients having serum Triglycerides 150-400 mg/dl.

Exclusion Criteria

- Pregnant and lactating mothers.
- Patients having impaired renal functions.
- Patients having Acute complications like Coronary Heart Disease, Acute Infective Hepatitis.
- Patients having active PR bleeding, active Haemorrhoids, fissure in ano, fistula in ano and other anarhya patients for Virechana karma.
- Patients not having Snehasiddhi lakshanas even after seven days of snehapana kala.
- Patients having disorders like carcinoma anywhere in the body or any other life threatening disease.

Criteria of Assessment

Assessment had done subjectively as well as objectively.

Subjective

Symptoms of Rasaraktagata snehavruddhi mentioned in the text or practically observed were assessed at each follow up and presence or absence of them was registered. All symptoms were graded into 0 to 3-4 grade scales on the basis of severity to assess the changes and this study in gradation was done at each follow up.

Objective

Lipid profile and Blood sugar level (fasting and post prandial) were assessed before and after treatment.

Gradation of symptoms

These were practically observed in Rasaraktagatasnehavruddhi as well as in Hypertriglyceridemia and mostly based on Classical Ayurvedic Texts.

1. Alasya Utsahahani

Grade 0- No alasya (doing work satisfactorily with proper vigor in time)

Grade 1- Doing work with satisfactorily with late initiation

Grade 2-Doing work with unsatisfactorily under mental pressure and takes time

Grade 3-Not starting any work on his own responsibility and doing little work very slowly

Grade 4-Does not take any initiation and not want to work even after pressure

2. Gaurav (Feeling Heaviness)

Grade 0- Absent

Grade 1-Feeling of heaviness but no effect on routine work Grade 2- Feeling of heaviness affecting routine work.

3. Nidraalu (Excessive sleep)

Grade 0- Normal sleep

Grade 1-Sleep more than 8 hours Grade 2-Feeling of sleepiness whole day

4. Shwasa (kshudrashwasa)

Grade 0- Absent

Grade 1- Dyspnoea after heavy work and relieved by rest Grade 2-Dyspnoea on slight exertions

Grade 3-Dyspnoea even at rest

RESULT AND OBSERVATION

- In this study, maximum patients were from age group 41-60 yrs (26.66%) and then of 21-30 yrs (23.33%)
- Amongst total patients 53.33% patients were Female and 46.66% were Male.
- Majority of patients in the trial group were of middle class (86.66%) and then from Higher class (13.33%).
- Amongst 30 patients, 26.66% were Housewife, 20% were doing service, 3.33% were doing their business, 13.33% were students and 36.66% were Workers.
- Amongst 30 patients, 26.67% were found to be illiterate and 73.33% were found to be Literate i.e. educated at different levels.
- It was observed that among 30 patients, 86.67% patients were Hindu, 10% were Muslim and 3.33% were other. Among christen, jain of other religion, that one was having Jain religion.
- 33.33% patients had history of taking medicine for any disease and 76.67% patients were not having any history of previous disease.
- In this study, 60% patients were found to have no family history of Hypertriglyceridemia whereas 40% patients were having family history of Hypertriglyceridemia
- It was noted that 80% patients were taking mixed food (i.e. both veg and non veg diet) and 20% were having only veg diet.

- In this study, 36.67% patients were having habit of taking Tea and/ or Coffee frequently. 26.67% were found to have alcohol addiction and 6.67% were found to have smoking addiction. 30% were found to have no addiction.
- In this study, it was seen that 46.67% patients were of Kapha-Pitta prakriti, 30% were Kapha-Vata, 6.67% were Pitta-Vata, 6.67% were Pitta-Kapha and 10% were of VataKapha prakriti.
- In this study, it was seen that 70% patients had Manda Agni, 20% patients had Vishama Agni, 10% had Tikshna Agni and no patient had Samagni.
- 43.33% patients were having Madhyama Koashta, 33.33% having Madhyama Koshtha and 23.33% patients were having Mrudu Koshtha.
- 86.67% patients had dushti of Kapha dosha dominant, 6.67% had each dosha dushti of Pitta and Vata.
- In this study, 66.67% patients were having Madhyam Vyayamashakti, 33.33% patients were of Avarashakti and 0% patients were of Pravara Shakti.
- In this study, 93.33% were from Anupa Desha, 6.67% were from Jangala Desha.

Statistical Analysis of The Effect of Therapy on Symptoms of Rasa-Raktagata Snehovruddhi of Trial Group By Wilcoxon Matched Pairs Signedrank Test

1. **Alasya:** Sum of all signed ranks was 465. The numbers of pairs were 30. P value was <0.0001, which was statistically extremely significant.
2. **Gaurava:** Sum of all signed ranks was 435. The numbers of pairs were 29. 10 pair was excluded from calculations because both values were equal. P value was <0.0001, which was statistically extremely significant.
3. **Nidralu:** Sum of all signed ranks was 465. The numbers of pairs were 30. P value was <0.0001, which was statistically extremely significant.
4. **Shwasa:** Sum of all signed ranks was 378. The numbers of pairs were 27. 3 pairs were excluded from calculations because both values were equal. P value was <0.0001, which was statistically extremely significant.

Effect on Haematological Parameters of 30 patients of Hypertriglyceridemia by paired 't' test

In the 30 group of patients of Hypertriglyceridemia, fasting Serum Triglyceride levels reduced by 101.47 ± 36.935, the p value is < 0.0001 which indicates statistically extremely significant. Value of t is 15.047.

Serum Total Cholesterol values were decreased in Trial group by 27.433±17.585. Paired t was 8.545. P value was < 0.0001, which was statistically extremely significant.

Serum HDL values were decreased by 1.200 ± 5.410in Trial group. Paired t was 1.215. P value was 0.1171, which was statistically not significant.

Serum VLDL levels were decreased by7.267 ±7.741 in Trial group. Paired t was 5.141. P was < 0.0001, which was statistically extremely significant.

Serum LDL levels in the Trial group was decreased by 8.133 ±14.445. Paired t was 3.084. P value was 0.0022 which was statistically very significant.

BSL Fasting in the Trial group was decreased by 6.000 ± 10.386. Paired t was 3.164. P value was 0.0018 which was statistically very significant.

BSL PP in the Trial group was decreased by 12.067 ± 29.703. Paired t was 2.225. P 0value was 0.0170 which was statistically significant.

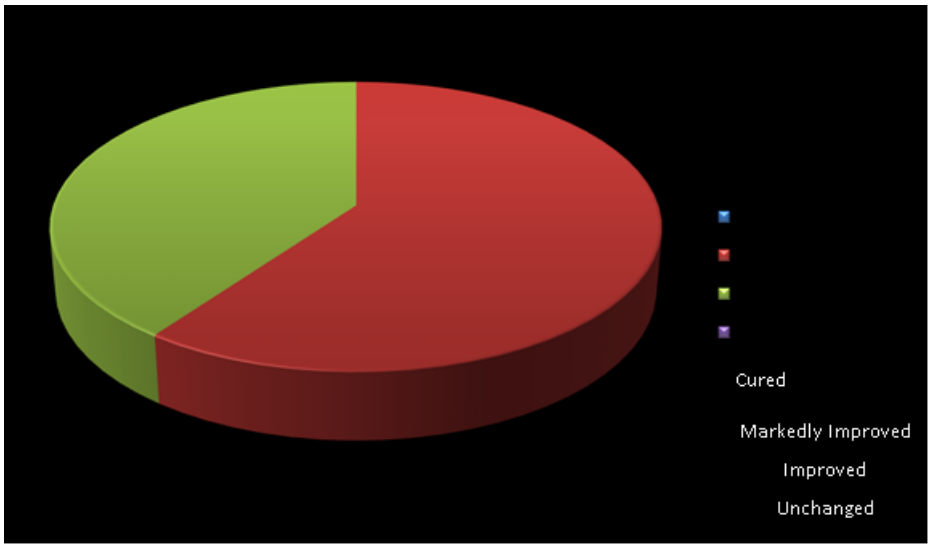
Weight in the Trial group was decreased by 3.067 ± 1.893. Paired t was 8.875. P value was < 0.0001 which was statistically extremely significant.

Effect of Therapy on Symptoms of trial group

1) **Alasya**: At the start of the study total score was 52, at the end of study it came down up to 18. The difference found was 34 and the percentage of Relief in the symptom on an average was 65.38%.
2) **Gaurava:** At the start of the study total score was 53, at the end of study it came down up to 10. The difference found was 43 and the percentage of Relief in the symptom on an average was 81.13%.
3) **Nidradhikya**: At the start of the study total score was 52, at the end of study it came down up to 14. The difference found was 38 and the percentage of Relief in the symptom on an average was 73.08%.
4) **Shwasa**: At the start of the study total score was 40, at the end of study it came down up to 10. The difference found was 30 and the percentage of Relief in the symptom on an average was 75%.
5) Overall it was seen that patient were more relieved for Gaurava (81.13%) symptom and then Shwasa (75%) symptom.

Total effect of therapy

In this trial, 18 patients (60%) were markedly improved, 12 patients (40%) were improved



Graph Showing Total effect of therapy in 30 patients of Hypertriglyceridemia with Subjective and objective parameters:

DISCUSSION AND CONCLUSION

With overall observations; female patients have more incidence of Hypertriglyceridemia. The age group of 41-60 yrs suffers more than the age group of 21-40 years cases. The middle class family found to have more incidences of Hypertriglyceridemia. The reason for this could be that the persons visiting hospital are more middle class in number, so the data and percentage can differ in broad population. The persons taking mix diet that is veg and non veg were found to have more incidence of Hypertriglyceridemia. As non veg diet is more Snigdha, guru in nature effecting pathophysiology of Rasaraktagata snehavruddhi.

The persons with Kapha Pitta prakriti with Madhyam koshta with Kapha Dosh prominent had more incidences of Hypertriglyceridemia. As main dosh dushti of the diease as per explained in review, Kapha dosha is the main culprit of the disease followed by Pachaka Pitta. The persons living in Anup Desh had more cases. As Kapha doshanubanda is present at Anup desha. Aahar was found more culpritas compared to Vihara in persons studied. The majority of cases had Manda Agni, as main pathophysiology is due to Mandagni only.

Hypertriglyceridemia i.e. here; Rasa-Raktagata Snehovruddhi, is due to Jatharagni Mandya which gets vitiated due to Ati Madhur, Snigdha, Guru, Sheeta Ahara and Avyayam. The Dhatwagni gets Poshan from mainly Jatharagni; so it also gets vitiated. Here we have seen

that Kapha Pitta Anubandhi Prakriti people are more. Also the Dosha dominance in these cases was found to be Kapha, which actually the main Sneha in the Aahra Rasa. The people presented with Mandagni; which is quite evident from the tables. So the aetiopathogenesis supports the data record and vice-versa.

The Vyayamshakti was found to be Madhyam in maximum patients as the Rasa and Rakta dhatu is of excess Sneha guna so it is not able to do work of proper circulation, hence patient feels weak after exertion. It should be noted that; it is not Avar; as Meda has not that much vitiated to cause Sthoulya. The Madhur Rasa was found to be taken in more quantity by the patients. So it clearly states the more Sneha in Aahara Rasa and so the vitiation of Agni. It should be noted that it is a complex process; that is the slow and steady process which requires Satatya in Hetu Sevan.

In the Trial group; there were 14prediabetic patients in which there was remarkable decrease in post prandial as well as fasting sugar levels. It is clearly stated that Diabetic patients have more triglycerides level as compared to the non-diabetic patients. It creates the resistance in reducing the lipid levels; when sugar is high. The cause of high triglycerides in Diabetes is poorly controlled blood sugar. As Insulin helps convert glucose into glycogen and helps to store glycogen in the liver.

Probable mode for action of therapy

1) Action of Shodhana-Virechana

Abhyantara snehapana with goghruta causes vivechana of sara and kitta within the cells of shakhas (Saptadhatu, twak etc). Further molecular splitting occurs followed by Utkleshana of Ama part helping to move ama out of the cell. Virechita drugs like trivrutta choorna, madan phala choorna, triphala kwatha and eranda tail helps to move shakhagata dosha towards koshta sthana and removing outside the body through adhomarga. Sansarjana karma is given for Agni sandukshana. Virechana causes strotoshuddhi, indriyaprasadanam, laghuta sharire, Agniprasadanam (balavana agni) and anamayatvam by purifying Chayapachaya kriya.

Likewise virechana has direct effect on Agnisthana. (hampered Agni is one of the initiating factor for Rasaraktagata Snehovruddhi.) It has the quality of Srotovishodhana and Agni sandukshana. So it will help in destroying the disease from its root.

2) Effect of Vachadi kashaya

Vachadi kashaya contains eight drugs as Vacha, Shunthi, Maricha, Pippali, Chitraka, Karanja, Shigru beeja and Kutaki. This drugs acts on following factors to decrease Rasaraktagata Snehovruddhi.

a. Jatharagni (Sthool Agni) Sandhukshan
b. Dhatwagni Sandhukshan
c. Strotas Shodhan
d. Drugs acting on the specific organ; that is; here working on Yakruta

The different group of drgus can be done on the working criteria of drugs; as follows:

Group 1: Jatharagni Deepan (Marich, Chitrak, Shunthi) For Sthoola Agni Chikitsa (Sthoola Pachana).

Group 2: Dhtavagni Sandhukshan (Pimpali, Chitrak, Shunthi, Kutki) For Sookshma Agni Chikitsa (Sooksma Pachana).

Group 3: Strotas Shodhan (Vacha, Chitrak, Shigru, Karanja) Helps to decrease Styana guna so as to reduce Samhanana.

Group 4: Drugs action on Yakruta (Kutaki, Shigru, Trikatu) Acts mainly on Agni Moolasthana i.e. Yakruta.

Group 1 contains the dravyas which are Katu in Rasa, so their action is Agni Deepana. Chitrak is itself called as Agni. Katu Rasa is having Teekshna, Ushna Guna which is similar to the properties of Agni. The Ayurvedic Principle of “Samanen Saman Vruddhi” supports the above action. Likewise it helps for Sthoola pachana.

Group 2 contains dravyas which are more Tikta in nature. It helps in Dhatwagni Deepan, thus curing the various symptoms of Snehovridhhi. Kapha is the main Dosha of this disease; so all the drugs having Kaphahara properties provided better result in this series. As stated earlier Rasa and Kapha are chief factors in the Samprapti of Snehovridhhi. Tikta Rasa has Khara property which is opposite to Sneha guna and also it has Vayu and Akasha Mahabhuta in dominance. According to principle of Ayurveda, Tikta Rasa increases body constituents having Khara property and Vayu Akasha Mahabhuta in dominance. Further Snehovruddhi is a metabolic type of disease Dhatvagni Mandyajanita Vyadhi. This metabolic nature of disease demands "Agnivruddhi" therapy particular at the level of Rasa dhatvagni and Jatharagni. When any Agni is not proper, Dhatus are not properly produced. Improper function of Agni is the root cause for all disease, most of the Deepana and Pachana drugs are

Katu and Ushna Virya properties and they act on the Jatharagni and Dhatvagni level. So it can be considered that dravyas might be acting at Dhatvagni level. These drugs have affinity towards Rasa and Rakta Dhatu. Likewise it helps in Sookshma agni pachana.

Group 3 drugs contained drugs which are more of Tikta Katu Kashay Rasa with Medohar properties. According to Charaka, these Tikta drugs posses the Lekhana, Karshana of Rasa, Meda and Kleda, Upashoshana properties. The Vacha have Lekhana and Virechaniya property. Katu & Tikta expel the vitiated material from the Srotas; so the obstructive Styan Rasa and Rakta have been cleared out from the Srotasa. So the Strotas Shodhan then helps in normal manufacturing of the Dhatus and helps to decrease Viscosity. In Bhav Prakash Samhitas Shigru has been included in the Medohar Dravyas.

Group 4 drugs contained drug which show effect on the Yakruta. It is tikta, katu, laghu in nature having kapha-pittahara property. It has properties like deepana, Yakrutottejaka and bhedan. The endogenous pathway of lipoprotein metabolism refers to the mainly hepatic secretions. Also liver is the moolasthana of Raktavaha strotasa. So drug acting on yakruta showed great effect on RasaRaktagata Snehovruddhi. It comes under Agnimoola sthana Chikitsa.

So final conclusion is Virechana karma followed by Vachadi kashaya is effective in the management of Rasaraktagata snehavruddhi with special reference to Hypertriglyceridemia.

SUMMARY

- Hypertriglyceridemia can be studied under the broad umbrella of Rasa Raktagat Snehovrudhhi.
- The total therapy – Virechana followed by Vachadi Kashaya have power of reducing Serum Triglyceride levels along with all lipid levels as well as blood sugar levels, though it is observed that the level of Triglycerides and VLDL are more affected by the therapy.
- It is also observed that Total therapy also helps in reducing weight of the patients.
- Virechana i.e. one of shodhan type helps to purify disturbance in the process of metabolism. It removes the vitiliated doshas from strotasa and helps in stotasashodhana. Thus metabolism is corrected through dhatwagni deepan at microlevel. Also dravyas like Vacha, Trikatu, Chitrak, Shigrubeej, Kutaki and Karanj are ushna-tikshna, kaphomedohara properties which helped in reducing elevated triglycerides.

Master Chart

Master chart of trial: (1)

Sr. Num	Reg Num	Age	Sex	Religion	Education	Eco	Occupation	Diet	Addiction
1	58725	66	M	O	HSC	H	Business	Veg	ALC
2	56883	46	F	H	HSC	M	Service	Mix	T
3	61280	45	F	H	SSC	M	H.W.	Mix	T
4	40420	37	M	H	ENGG	M	Service	Mix	ALC
5	61321	57	M	H	HSC	M	Worker	Mix	ALC
6	1786	36	M	H	SSC	M	Worker	Mix	SMK
7	2147	21	F	H	HSC	H	Student	Mix	C
8	11180	40	F	H	HSC	M	H.W.	Mix	T
9	5431	60	F	H	ILL	M	H.W.	Veg	T
10	9449	45	F	M	ILL	M	H.W.	Mix	T
11	7613	30	M	H	ILL	M	Worker	Mix	SMK
12	18375	44	M	H	ILL	M	Worker	Veg	C
13	21748	44	F	H	HSC	H	H.W.	Veg	C
14	30460	38	F	H	BSC	M	Service	Mix	T
15	31755	45	F	H	ILL	M	H.W.	Mix	No
16	15396	29	M	M	SSC	M	Service	Mix	No
17	31854	51	M	H	HSC	M	Worker	Mix	ALC
18	33844	35	F	H	BSC	M	Service	Mix	C
19	35128	53	F	H	SSC	M	Worker	Mix	No
20	34989	26	F	H	HSC	M	Service	Mix	No
21	34990	27	F	H	BAMS	M	Student	Mix	No
22	35010	25	F	H	BAMS	M	Student	Mix	T
23	35892	26	M	H	BAMS	M	Student	Mix	ALC
24	37280	52	M	M	ILL	M	Worker	Mix	ALC
25	40436	55	F	H	SSC	M	H.W.	Mix	No
26	41414	50	M	H	ILL	M	Worker	Mix	ALC
27	41957	45	F	H	SSC	M	H.W.	Veg	No
28	2936	41	M	H	HSC	M	Worker	Veg	No
29	51114	58	M	H	HSC	M	Worker	Mix	No
30	52289	40	M	H	ILL	M	Worker	Mix	ALC

Master chart of trial (2) demographic data

Sr. No	Reg. Num	F/H/O	P/H/O	Desh	Prakrut i	Dosha	Koshta	Agni	Vyayam Shakti
1	58725	Yes	Yes	Anup	KP	K	Mrudu	Mand	Mand
2	56883	Yes	No	Anup	KV	K	Krur	Mand	Mand
3	61280	Yes	No	Anup	KP	K	Mrudu	Mand	Mand
4	40420	Yes	No	Anup	KV	P	M	Tikshna	AVG
5	61321	No	Yes	Anup	VK	V	Krur	Visham	AVG
6	1786	No	No	Anup	KV	K	M	Mand	AVG
7	2147	No	No	Anup	KP	K	Mrudu	Mand	AVG
8	11180	No	No	Anup	KP	K	Mrudu	Mand	AVG
9	5431	No	No	Anup	KV	K	Mrudu	Mand	Mand
10	9449	No	Yes	Anup	VK	V	Krur	Visham	AVG
11	7613	No	No	Anup	KP	K	M	Mand	AVG
12	18375	No	No	Jangal	KV	K	Krur	Vishama	AVG
13	21748	No	No	Anup	PK	P	Mrudu	Tikshna	Mand
14	30460	No	No	Anup	PV	K	Krur	Tikshna	Mand
15	31755	No	No	Anup	KP	K	M	Mand	Mand
16	15396	Yes	No	Anup	KP	K	M	Mand	AVG
17	31854	No	No	Anup	KV	K	Krur	Vishama	AVG
18	33844	No	No	Anup	KP	K	Krur	Vishama	AVG
19	35128	Yes	No	Anup	KV	K	Krur	Vishama	Mand
20	34989	Yes	No	Anup	KP	K	M	Mand	Mand
21	34990	Yes	No	Anup	KP	K	M	Mand	AVG
22	35010	Yes	No	Anup	KP	K	M	Mand	AVG
23	35892	Yes	No	Jangal	KV	K	Krur	Mand	AVG
24	37280	No	Yes	Anup	VK	K	Krur	Mand	AVG
25	40436	No	Yes	Anup	KP	K	M	Mand	AVG
26	41414	No	No	Anup	PK	K	Mrudu	Mand	AVG
27	41957	No	No	Anup	KP	K	M	Mand	Mand
28	2936	Yes	No	Anup	KV	K	M	Mand	AVG
29	51114	Yes	Yes	Anup	KV	K	M	Mand	AVG
30	52289	No	Yes	Anup	KP	K	M	Mand	AVG

Symptoms master chart: (3)

Sr. Num	Alasya		Gaurav		Nidralu		Shwasa	
	BT	AT	BT	AT	BT	AT	BT	AT
1	2	1	2	1	2	1	2	1
2	2	1	2	0	2	1	2	1
3	1	0	1	0	2	1	1	0
4	2	1	2	1	2	1	1	0
5	2	1	2	1	2	1	1	0
6	1	0	2	0	1	0	1	0
7	2	1	2	0	1	0	1	0
8	2	1	2	1	2	1	1	1
9	2	1	2	0	2	1	1	1
10	1	0	1	1	1	0	2	0
11	1	0	1	0	1	0	1	0
12	2	1	2	0	2	1	1	1
13	1	0	2	0	2	1	1	0
14	3	1	2	1	2	1	2	1
15	2	1	2	0	2	0	1	0
16	2	1	2	1	2	0	2	1
17	1	0	1	0	1	0	1	0
18	2	1	2	0	1	0	1	0
19	3	1	2	1	2	0	2	1
20	1	0	2	0	2	0	1	0
21	2	1	2	0	2	1	1	0
22	2	1	2	0	2	1	1	0
23	2	1	2	1	2	0	2	1
24	1	0	1	0	1	0	2	0
25	2	0	2	1	2	0	1	0
26	2	0	2	0	2	0	2	1
27	1	0	1	0	2	1	2	0
28	1	0	1	0	1	0	1	0
29	2	1	2	0	2	1	1	0
30	2	1	2	0	2	0	1	0

Hematological master chart: (4)

Sr. Num	Triglycerides		Cholesterol		Vldl		Hdl		Ldl	
	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT
1	170	133	213	198	34	27	39	44	140	127
2	163	142	173	158	33	30	59	49	85	82
3	243	137	123	127	49	27	35	42	39	58
4	249	184	239	177	50	37	50	41	139	99
5	246	135	155	166	49	27	39	41	67	98
6	285	210	196	175	49	42	42	46	84	87
7	215	181	182	148	42	36	38	42	121	101
8	321	200	172	168	62	42	40	38	132	112
9	245	180	156	141	58	40	42	41	102	102
10	302	165	188	160	50	33	49	43	126	116
11	386	200	192	169	56	42	50	45	132	112
12	245	185	212	200	28	21	45	40	110	108
13	268	152	186	150	14	20	60	44	106	108
14	202	142	187	157	24	22	45	43	98	100
15	286	152	192	161	40	34	40	46	105	107
16	269	148	182	150	34	30	42	42	115	98
17	252	140	196	152	36	32	46	42	94	96
18	246	139	146	130	29	25	43	41	102	100
19	224	148	177	132	25	27	42	42	140	113
20	248	142	180	144	32	35	34	40	112	94
21	272	137	159	132	29	30	38	32	106	102
22	281	156	192	162	42	32	42	42	110	102
23	242	146	190	153	38	33	43	42	112	94
24	290	172	212	180	16	22	45	43	116	102
25	285	169	201	139	32	27	48	45	114	112
26	309	189	198	141	28	27	35	42	141	109
27	253	142	209	162	51	36	42	43	102	100
28	352	192	142	131	42	35	36	39	136	121
29	256	142	155	141	31	27	51	44	73	75
30	237	138	184	162	47	34	43	43	123	103

Master Chart: (5)

Sr. Num	BSL (F)		BSL (PP)		Weight	
	BT	AT	BT	AT	BT	AT
1	93	87	114	109	70	65
2	102	100	141	138	94	89
3	111	105	152	122	65	62
4	110	94	160	152	60	58
5	114	106	176	94	55	54
6	110	112	152	163	68	65
7	112	94	150	127	72	70
8	142	110	146	121	80	75
9	93	95	142	121	58	56
10	116	106	128	110	79	78
11	114	104	147	114	54	53
12	102	102	148	128	58	57
13	74	84	72	76	48	47
14	89	89	126	121	90	84
15	84	82	138	121	64	63
16	90	92	127	124	76	74
17	140	108	149	116	48	47
18	86	96	120	102	59	57
19	97	92	124	112	87	82
20	84	87	121	127	59	57
21	99	100	110	114	63	61
22	121	100	142	112	65	62
23	121	101	168	112	69	63
24	101	98	138	114	72	69
25	112	112	152	147	84	76
26	109	108	140	133	85	79
27	102	100	101	112	75	72
28	121	110	180	142	69	65
29	98	96	122	112	64	61
30	95	92	121	119	62	59

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