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An approach of *Ashwagandha* + *Guggulu* in Atheromatous CHD associated with Obesity

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ABSTRACT : The Coronary Artery Disease or Coronary Heart Disease is the single biggest killer (60%) and the most common cause of maximum morbidity, ironically. Infact this is a disease whose control is most in our hands and it is most life style dependent. In accordance with the latest reports more than 13.7% of the adult population is suffering from coronary heart disease in India, and this figure is constantly on the rise year after year. The main cause of the disease is obesity in terms of enhanced circumference, deposition of cholesterol and fat in the inner smooth lining of the coronary arteries supplying blood to the heart resulting in their blockages and obstruction to blood flow through them. Atheromatous plaque is formed which constricts the flow of blood, oxygen, and nutrients to the heart muscles. With significant blockages, about 60% to 70% of the vessel wall and exertion the increased demand of blood by the heart is not met. More than 100 number of risk factors responsible for the development of CHD are documented. Williams in 1981 identified 246 risk factors that directly or indirectly lead to the development and onset of heart disease. The excess risk is closely related to the plasma concentration of LDL cholesterol and is inversely related to the plasma concentration of LDL cholesterol and is inversely related to the plasma HDL Cholesterol concentration. There is also a weak correlation between plasma triglyceride concentration and the incidence of coronary artery disease. Moreover, numerous clinical trials have shown that lowering high cholesterol concentrations by diet or drugs can reduce the risk of cardiac events. Moreover, many allopathic antihypertensive drugs have been shown to reduce coronary mortality but by less than might have been anticipated, possibly because many of these agents have potentially adverse effects on lipid and glucose metabolism. Ayurvediya care from both the preventive and therapeutic ways like primary protection in terms of *Swasthya Vritta* with *Aushadha* along with *Pathyapathya and Ashwagandha+Guggulu* provide tremendous results with secondary cardio protection by their anti hyperlipidamic, antiatherosclerotic, antihypertensive actions. All the patients already on prescribed allopathic medicine and cardiac diet were taken. An attempt to evaluate the efficacy of ayurvediya *Ashwagandha+Shuddha guggulu* in 500mg twice daily in 20 patients of atheromatous coronary hypertensive heart patients associated with obesity is made at Clinical Research Unit, Safadarjang Hospital New Delhi during 2007.

Key words : Integrated role, Ashwagandha, Guggulu, Atheroma, Coronary Heart Disease, Obesity.

INTRODUCTION

The Coronary Heart Disease is the commonest form of heart disease and single most important cause of premature death in the developed world. In UK, one in three men and one in four women die from this disease, an estimated 330,000 people have a myocardial infarct each year and approximately 1.9 million people have angina. The death rates from coronary heart disease in UK are among the highest in the world (Nearly 170000 people died from coronary heart disease in the UK in 1992). Unfortunately the incidence of the condition is increasing rapidly in Eastern Europe and developing India.

Disease of the coronary arteries is almost always due to atheroma and its complications, particularly thrombosis. Atheroma or atherosclerosis is a patchy focal disease of the arterial intima. Hyperlipidemia, also known as hyperlipoproteinemia or high cholesterol, is a disorder characterized by abnormally high concentrations of lipids (fats) in the blood that are correlated with the development of atherosclerosis, the underlying cause of coronary heart disease (CHD).

Atheroselerosis or hardening of the arteries results from build up of cholesterol on the interior blood vessel walls. It is the LDL that lead to this build-up and HDL takes the cholesterol back to the liver. Guggulipids have been found the capacity to lower the VLDL, LDL and triglycerides with simultaneously raising the HDL revealing that Guggulu is useful in providing protection against atherosclerosis. Ayurveda has a tremendous wisdom of friendly medicine. *Commiphora mukul* and *Withania somnifera* have a long history of use in Ayurveda in particular to hyperlipidemia and for cardiac disorders. The Atharva Veda is the earliest reference for medicinal and therapeutic properties of both the drugs separately for the cardiac disorders. Detailed descriptions regarding its actions, uses and indication as well as the varieties of Ashwagandha and Guggulu have been described in

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numerous Ayurvedic treatises including Charaka Samhita (1000 BC), Sushruta Samhita (600 BC) and Vagbhata (7th century AD). An approach of both drugs in Ayurveda is considered to be responsible for reducing fat, atheroselerosis, hyperlipidemia, hypertension and ultimately beneficial in heart diseases.

Aims and Objectives :

1. To establish an integrated approach of Ayurveda.
2. To know the efficacy of Ashwagandha + Guggulu on atheromatous CHD associated with obesity.

MATERIAL AND METHOD

With the reference available, the complete study is planned herewith to judge the claim of ancient medical science in reference to hyperlidimia, artherosclerosis, and Coronary cardiac disorder. A clinical study was planned out under following facts :

- Clinical Study :

Total 20 patients of diagnosed Coronary Artery Disease (CAD) associated with obesity registered in Clinical research Unit, Safdarjung Hospital, New Delhi during 2007. All those cases were from the 40 to 60 years of the age and of either sex from middle class socio economically.

All the selected cases were established cases of CAD with obesity of the chronocity of upto 4 years and were on with allopathic prescribed medicine and diet. The present trial was an attempt to know the general well being along with the maintain level of hypertension, cholesterol, weight reduction and lipid profile. All the selected patients registered, filled up proforma, and examined and diagnosed. All the pathological, biochemical and other tests (whatever required) have been performed twice before and after trial. For the trial Ashwagandha powder 500 mg + Shuddha Guggulu 500 mg twice a day with ayurvediya pathyapathya for 12 weeks with the follow up of 6 months have observed.

Ayurvedic Chikitsa Sutra-

"Guru Chatarpanam Cheshtam Sthulanam Karshanam Prati." (Cha. Su. 21/20)

Charak has instructed that Guru ahar and Atarpana measures are the best regimen for obesity. This principle is contradicted with modern regimen in which they stress on light food, but it is a fact that light food is increasing the intake and frequencies.

- Pathya **:**The diet was Vata-Kapha-Meda Hara. Ruksha Ubtana, Ruksa, Ushna Basti Vihar are indicated for obese in ayurveda.
- Pathya Vihar : Adequate sleep, exercise and mental fatigue are the key resources for reduction of weight.

OBSERVATION AND RESULT

The efficacy of the trial drug was mentioned in the category of Good, Fair and poor responses in clinical Symptomatology, Systolic, Diastolic blood pressure, general well being, pathological & biochemical parameters.

TABLE NO. 1 : AGE & SEX WISE DISTRIBUTION OF 20 PATIENTS :

Age (Yrs)	Male	Female	Total
40-50	05	06	11
50-60	04	05	09

TABLE NO. 2 : PRAKRITI WISE DISTRIBUTION OF 20 PATIENTS :

Vata	Pitta	Kapha	Vata Pitta	Pitta Kapha	Vata Kapha	VataKapha Pitta	Total
04	01	03	--	01	11	--	20

TABLE NO. 3 : DURATION WISE DISTRIBUTION OF 20 PATIENTS :

Duration	No. of Patients
< 2 yrs	03
2-3 Yrs	06
3-4 Yrs	06
4-5 Yrs	03
> 5 yrs	02

TABLE NO. 4 : MEAN, SD, P VALUE, SYSTOLIC, DIASTOLIC, WEIGHTS, FBS AND PBS IN THE TRIAL :

Variables	Before treatment (SD)	After treatment (SD)	p value
Weight	70.8 (23.6)	62.26 (19.8)	0.01
Fasting Blood Sugar	118.0 (19.80)	118 (19.8)	0.00
Post prandial Blood Sugar	160.6 (20.3)	158.4 (20.6)	0.00

TABLE NO. 5 : SYMPTOMATOLOGICAL DISTRIBUTION OF 20 PATIENTS :

Clinical Symptoms	Before Treatement	After Treatment
Polyphagia	70%	10%
Polydipsia	82%	22%
Excess Sweating	55%	18%
Excess Sleep	68%	21.22%
Body fatigue	85%	13.2%
Loss of libido	96%	26%
Palpitation/Dyspnoea on exertion	90.8 %	16.4%

TABLE NO. 6 : DISTRIBUTION OF THE 20 PATIENTS AS PER MEAN SCORE OF BIOCHEMICAL PARAMETERS :

Parameters	Before Treatement	After Treatment
Body Weight (Kg)	68.8 ± 5.36	60.26 ± 6.12
S. Cholesterol (mg%)	272.2 ± 50.14	192.60 ± 48.66
S. Triglycerides (mg%)	97.20 ± 35.33	54.07 ± 34.82
LDL (mg%)	190 ± 51.68	108.46 ± 40.88

TABLE NO. 7 : HYPERTENSION DISTRIBUTION OF THE 20 PATIENTS AS PER SYSTOLIC PRESSURE :

Score	Initial S	Initial D	2nd wk S	2nd wk D	6th wk S	6th wk D	10th wk S	10th wk D	12th wk S	12th wk D
Mean	150	100	144	96	142	96	140	92.2	132	90
+SE	+3.32	+1.20	+2.40	+0.98	+2.90	+1.28	+2.12	+1.18	+1.24	+0.42

TABLE NO. 8 : DISTRIBUTION OF THE 20 PATIENTS AS PER DIASTOLIC PRESSURE :

Score	Initial S	Initial D	2nd wk S	2nd wk D	6th wk S	6th wk D	10th wk S	10th wk D	12th wk S	12th wk D
Mean	100	106	100	102	94	100	90	92.2	86	72
+SE	+3.32	+1.20	+2.40	+0.98	+2.90	+1.28.	+2.12	+1.18	+1.24	+0.42

TABLE NO. 9 : DISTRIBUTION OF THE 20 PATIENTS AS PER GENERAL WELL BEING :

Parameter	Day 0	Day 45	Day 90
Mathematical test	12.00 + 082	9.12 + 0.72	5.11 + 0.92
Isometric exercise test	14.00 + 1.40	11.20 + 1.0	10.44 + 1.00

TABLE NO. 10 : HYPERLIPIDEMIA DISTRIBUTION OF THE 20 PATIENTS :

Duration	TC (mg/dl)	HDLc (mg/dl)	TC/HDLc (Risk factor)
Initial	284.00+48.44	+50.12+12.12	8.10+2.80
After 12 wk	200.12+42.42	58.20+10.20	4.80+1.22
Comparison	p<0.001	p< 0.05	p<0.001

TABLE NO. 11 : PLATELET COUNT DISTRIBUTION OF THE 20 PATIENTS :

Parameters	Basal	On 0 day	On 90th day
Platelet count (/cumm)	227800 +32,420	230500 +34,430	241000 +30,310
Clot retraction time (min)	46.24 + 3.3	48.60 + 2.9	48.00 + 2.8

TABLE NO. 12 : CORONARY HEART DISEASE DISTRIBUTION OF THE 20 PATIENTS :

Features	Pre trial	With trial
Anginal attack	4.10 + 0.30	1.12 + 0.22
NTG consumption	3.30 + 0.58	1.20 + 0.16

TABLE NO. 13 : RESULT AS A WHOLE DISTRIBUTION OF THE 20 PATIENTS :

Response	No of patient	%
Good	10	50 %
Fair	10	50%
Poor	---	---

The trialed Ayurvedic preparation has reduced stress and leaded sound sleep along with lowering blood pressure significantly (Table no. 7 & 8).

On General well being : There was also a feeling of general well being and emotional disturbances were reduced considerably (Table no. 9).

After using trial therapy the resting pulse rates and both systolic and diastolic blood pressure showed a significant reduction. In addition to lowering of blood pressure and reduction of dosage of drugs (Table no. 12).

DISCUSSION

The effect is proclaimed to resulting out from the trial drug action on liver and thyroid, wherein, thyroid is stimulated to increase body's metabolic rate and the liver is stimulated to metabolize LDL cholesterol. Being antioxidant helps to stop the oxidation of cholesterol and subsequent hardening of the arteries. Moreover, reduction of the stickiness of platelet, another effect that lowers the risk of coronary artery disease. It stimulates the LDL receptor binding activity in hepatocytes and enhance its catabolism. It also inhibits oxidative modification of LDL due to its constituent gugglusteronol. Increase thyroid stimulation improves digestion and accelerate metabolism to pass the food along the GIT tract quickly. It also prevents the transformation of undigested carbohydrates into triglycerides and reduces cholesterol in blood by metabolizing the existing fatty acid that are correlated with the development atheroselerosts, the underlying cause of coronary heart disease (CHD) and stroke.The markedly inhibits liver cholesterol biosynthesis. This causes inference in lipoprotein formation and lipid turnover.

The mode of trial may be understood in following ways :

The oleoresin of Guggulu contains 0.37% essential oil, containing mainly myrecene, dimyrecene and polymyrecene. Solvent extraction, hydrolysis, and column chromatography over silica gel of guggulu resin identifies a number of compounds such as diterpene hydrocarbon, a diterpene alcohol, Z-guggulsterone, E-guggulsterone, guggulsterol-I, guggulsterol-II & guggulsterol-III, cholesterol. Sesamin and camphorene.

The gum of Guggulu is insoluble in ethyle acetate, chemically characterized as carbohydrate. The resinous portion dissolves in ethyl acetate and posseses both anti-inflammatory and lipid-lowering properties. It was further separated into acidic, basic and neutral fraction that comprised approximately 4%w/v, 0.3%w/v and 95%w/v of the ethyl acetate soluble resin, respectively. The basic fraction is devoid of any activity, while acidic fraction possesses significant anti-inflammatory activity; the neutral ketonic fraction possesses lipid-lowering activity.

The lipid lowering activity of guggulu was first reported and an active lipid lowering agent, a standardized fraction from ethyl acetate extract of guggul gum containing guggulsterone mixed with some other steroids, diterpene, esters and higher alcohols named as guggulipid was developed. The hypolipidemic activity could be attributed to several mechanisms including inhibition of cholesterol biosynthesis and enhancement in cholesterol degradation and / or excretion. Guggul compounds are antagonist legend for bile acid receptor called farnesoid X receptor (FXR), which is an important regulator of cholesterol homeostasis. It is likely that this effect accounts for the hypolipidemic activity of these phytosteroids. Guggulsterone have the capability of inhibiting oxidative modification of Low Density Lipoprotein.

The hypolipidemic activity could be attributed to several mechanisms including inhibition of guggul gum containing guggulsterone mixed with some other steroids, diterpene, cholesterol biosynthesis and enhancement in cholesterol degradation and / or excretion. Guggul compounds are antagonist ligands for bile acid receptor called farnesoid X receptor (FXR), which is an important regulator of cholesterol homeostasis. It is likely that this effect accounts for the hypolipidemic activity of these phytosteroids. Guggulsterone have the capability of inhibiting oxidative modification of LDL.

Protective and antioxidant properties of Guggulu also play a part in its lipid lowering activity and reduce lipid peroxides, Xanthine oxidase and increases superoxide dismutase has been found to have the capacity to enhance production of thyroxin (T4), Guggul triidothyronine (T3) (thermogenic activity), which also account for its lipids. A keto steroid, 2-gugglusterone was found to counteract the thyroid suppressant activity of carbimazole. Preclinical studies have reported guggulu's effect on biogenic amines, catecholamine and dopamine liable to attribute to its lipid lowering properties. It has been noted for helping the hypercholesterolemic B rabbits to recover the decrease in catecholamine sythesis. Guggulu significantly lowers serum triglycerides and cholesterol as well as LDL and VLDL cholesterol.

Atheroselerosis or hardening of the arteries results from build up of cholesterol on the interior blood vessel walls. It is the LDL that lead to this build-up and HDL takes the cholesterol back to the liver. Trial drug has been found having capacity to lower the VLDL. LDL and triglycerides with simultaneously raising the HDL revealing that Ashwagandha Guggul is useful in providing protection against atherosclerosis. Being antioxidant it helps to stop the oxidation of cholesterol and subsequent. Trial drug inhibits platelets aggregation and provide protection against myocardial ischemia[5].

Hyperlipidemia is caused by abnormal lipid and lipoprotein metabolism. On the other hand, the cardioprotective HDLc were elevated by the trial therapy. This preparation has given result to reduce the weight as such. And obesity in general also well controlled by significant result obtained after the trial therapy.

Ashwagandha is advocated as a protective drug against atherosclerosis, hypertension and coronary heart disease. It reduces the sensitivity of the heart to adrenergic stimulation and thereby protects the heart against sympathetic outbursts[6].

Thus, it is wise to use a combined approach of Ayurveda in order to minimize risks of other complications and prove as a cardioprotective properties especially in obese patients.

CONCLUSION

In this trial following conclusion can be withdrawn:

1. Maximum no. patients were noticed from the age group of 40-50 years and female were predominant in this trial. This may be due to middle age stress of responsibilities amongst female.
2. The optimum no of patients were reported of *Vata Kapha Prakriti* in this trial as Stress is the result of *Vata* and increased *Meda* was from the *Kapha* predominant.
3. Two to four years duration of the disease was observed in this trial.
4. Significant reduction have been noticed in the weight, blood sugar fasting and post parandial parameters in present trial. This may be due to pharmacodynamic properties.
5. Polyphagia, polydipsia, excess sweating, excess sleep, body fatigue , loss of libido and palpitation / dyspnoea on exertion were featured significantly improved due to pramehghna[4], medohar[2] as well as Hridya properties.
6. Significant relief was expressed in weight gain, hypercholestraemia, increased serum triglyceride and lypidemia.

7. The of trialed Ayurveda has reduced stress and leaded sound sleep along with lowering blood pressure significantly.
8. There was a feeling of general well being and emotional disturbances were also reduced considerably.
9. After using trial therapy the resting pulse rates and blood pressure both systolic and diastolic showed a significant reduction. In addition to lowering of blood pressure and reduction of dosage of drugs.
10. This has a lipid lowering effect, bradycardiac effect and antiatherosclerotic properties. Therefore, it can become an important addition to the various antihypertensive agents available today having a multifold beneficial effect of the cardiovascular system.[1]
11. It also reduces the platelet adhesiveness and aggregation[7] and thus is beneficial in coronary heart diseases. Excessive platelet activation may be involved in acceleration of hypertensive arterio vascular damage and atherosclerosis.[8]
12. Angina attack and NTG consumption were reported less significantly with trial. This is because of the efficacy of the trial drugs.
13. Good and fair result was found in the trial in equal ways.

Henceforth, the trial drug can be prescribed alongwith the established drugs for CHD with obesity for better health care to such patients.

Suggestions : To put a mandatory prescription of the trial drug in the patients of CHD associated with obesity. It is suggested to take more subjects for the trial.

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हिन्दी सारांश

अश्वगंधा व गुग्गुलु का स्थौल्य सहित एथेरोमेटस कोरोनरी हार्ट डिसिज (हृद्रोग) में प्रयोग

राखी मेहरा, महादेव प्रसाद एवं जी. एस. लवेकर

विश्व में जीवनशैली से संबधित बीमारियों में सब से खतरनाक ६०% कोरोनरी हार्ट (हृद्रोग) मेदोरोग सहित पाया जाता है। इस रोग से मृत्युदर एवं व्याधिदर में लगातार वृद्धि हो रही है। आंकडों के आधार पर सिद्ध है कि वर्तमान में भारत के १३.७% वयस्क इस रोग से ग्रसित हैं। इतनी बढ़ती दर में मुख्यतः मेदोरोग, बढ़ते कोलेस्ट्रोल एवं वसा, संकरी होती कोरोनरी धमनी है। इस तरह से वसा जनित एथेरोमेटस प्लेक कोरोनरी आर्टरी (हृदय रक्त वाहिनी) में रक्तसंवहन में अवरोध होता है। फलतः हृदय को आक्सीजन एवं पोषक तत्त्वों की कमी हो जाती है। आक्सीजन की ६०% से ७०% आवश्यकता में कमी होना निश्चित ही हृदय रोग को इंगित करता है। इस रोग हेतु लगभग १००% से अधिक धोखादायक घटक उत्तरदायी होते हैं । १९८१ में विल्यम ने २४६ घटकों को प्रथम या द्वितीय स्तर पर उत्तरदायी माना है। सीधे उत्तरदायी घटकों में एल.डी.एल. कोलेस्ट्रोल का बढ़ता प्रतिशत है। इस सम्बंध में घटता एच.डी.एल. मुख्यतः अप्रत्याशित रूप से उत्तरदायी होता है। अनेक चिकित्सकीय अनुसंधानों द्वारा यह सिद्ध होता है कि आहार या औषध से कोलेस्ट्रोल का प्रतिशत कम करने से हृदय रोग में कमी की जा सकती है। साथ ही अनेक एलोपेथी औषधियां जो उच्च रक्तचाप को कम करने हेतु प्रयुक्त होती हैं , हृदय रोग में उपयोगी हैं तथापि ये लिपिड एवं ग्लूकोज के मेटाबोलिज्म में विपरीत प्रभाव डालती हैं। अतः आयुर्वेद अपने रक्षात्मक एवं चिकित्सात्मक पहलुओं से और स्वस्थवृत्त, औषध एवं पथ्यापथ्य नियमों से हृदयरोग में प्राथमिक एवं द्वितीयक रक्षा देता है। औषधी अपने उच्च लिपिड विरोधी, एथरोस्क्लेरोसिस विरोधी, उच्च रक्तचाप विरोधी गुणों से हृदयरोग में लाभकारी होती है। प्रस्तुत पत्र में ऐसी ही औषधी अश्वगंधा+शुद्ध गुग्गुलु को ५०० मि. ग्रा. की मात्रा में दिन में दो बार २० ओबेसिटी सहित एथेरोमेटस कोरोनरी हाइपरटेंसिव हृदय रोगी जो चिकित्सकीय अनुसंधान एवं सफदरजंग अस्पताल, नई दिल्ली में २००७ में पंजीकृत किये गये, का अध्ययन वर्णित है।

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