

Research Article

Efficacy of *Tryushanadi Guggulu* in the management of Hyperlipidemia

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ABSTRACT:

Deposition of fat at various sites over the body is termed as obesity. Increased levels of triglycerides, cholesterol and low density lipids in the blood are coined as hyperlipidemia. Generally obesity and hyperlipidemia comes as hand in hand. Hyperlipidemia if untreated leads to vascular diseases of brain, heart and kidney. *Guggulu* (*Commifera mukul*) a herbal drug is a drug of choice in obesity. *Tryushanadi Guggulu* a multiherbal preparation having 33.33 % of *Guggulu* is described by Acharya Bhavapakash in treatment of *Sthaulya* (Obesity).

KEY WORDS: Obesity, Lipid Profile, Hyperlipidemia, *Guggulu*(*Commifera mukul*)

INTRODUCTION:

Sthaulya or Obesity is a blessing of the modern age of machines and materialism. It occurs as a result of lack of physical activity with increased intake of food. The industrialization, stress during the work, dietary habits, lack of exercise & various varieties among the daily diet e.g. fast food, frozen fruits, increased amount of soft drinks and beverages, canned foods results into the clinical entity which we can call as Obesity(*Sthaulya*). *Guggulu* (*Commifera mukul*) is having *medolekhana* properties and *Guggulu kalpas* are the choice of drug for the treatment of obesity.

Aim and objectives:

To study the efficacy of "*Tryushanadi Guggulu*" in hyperlipidemia associated with Obesity.

Review of literature:

Tryushanadi Guggulu is described by Acharya Bhavaprakash for the treatment of *Sthaulya* in 39th *adhyaya* as a one of the drug of treatment for *Sthaulya*.

Drug review: *Tryushanadi Guggulu* is a poly-herbal formulation, which contains total 9 ingredients. (Ref: Bha. Pra./ *Sthaulya Chi. Adhyaya* 39)(Ref. *shloka* 1)

Table No. 01: Raw drugs of *Tryushanadi Guggulu*

Sr. No.	Drug Name	Latin Name	Part Used	Proportion
1	<i>Shunthi</i>	<i>Zingiber officinalis</i> Roxb.	Rhizome	4.76%
2	<i>Marich</i>	<i>Piper nigrum</i> Linn.	Dried fruits	4.76%
3	<i>Pippali</i>	<i>Piper longum</i> Linn.	Dried fruits	4.76%
4	<i>Chitraka</i>	<i>Plumbago zeylanica</i> Linn.	Root	4.76%
5	<i>Mustaka</i>	<i>Cyperus rotundus</i> Linn.	Rhizome	4.76%
6	<i>Vidanga</i>	<i>Embelia ribes</i> Burm.	Dried fruits	4.76%
7	<i>Vacha</i>	<i>Acorus calamus</i> Linn.	Rhizome	4.76%
8	<i>Shuddha Guggulu</i>	<i>Commiphora mukul</i> Engl.	Gum/ Resin	33.33%
9	<i>Go- ghrita</i>	-	Ghee	33.33%

Measurement of Obesity:

Obesity is the sign of disturbed metabolism of carbohydrates, fats and proteins. On the basis of nutrition, individuals can be classified into 3 groups –

- a) normal
- b) Overweight (fat or obese) and
- c) Underweight.

Assessment of nutrition can be done by following 4 methods:**Ideal body weight (IBW)**

IBW in men: $22.5 \times (\text{height in meters})^2$
 IBW in women: $0.94 \times 22.5 \times (\text{height in meters})^2$
 Body weight $> 10\%$ of IBW = Overweight
 Body weight $> 20\%$ of IBW = Obese.

Body mass index (BMI)

BMI = Weight in kg / (height in meters)²
 The normal range of BMI is 19-25. In men = 20-25, in women = 18-23.
 BMI between 25-30 = overweight

BMI > 30 = obese
 BMI > 40 = very obese

Skin fold thickness:

Normal triceps skin fold thickness
 Adult males = 12.5mm
 Adult females = 16.5mm

Broca' index (Rough calculation of body weight):

This can be calculated in persons having height above 100 cm.

Desired body weight in kg = Height in cm - 100.

Height in inches = Body weight in kg.

Table No. 02: Assessment of obesity depending upon waist – hip ratio

Waist-hip ratio	Type of obesity	Prognosis
0.8 or less	Pear -shaped obesity	Good
0.9 or greater	Apple-shaped obesity	Greater risk of developing complications of obesity.

Investigations related to Obesity:

Lipid profile is the key investigation to detect threat of obesity.

Table no. 03: Lipid Profile tests and their normal range

Sr. No.	Test	Normal range
1.	Serum Cholesterol	130 – 200 mg/dl
2.	HDL Cholesterol	30-60 mg/dl
3.	Serum triglycerides	50-200 mg/dl
4.	V L D L	10-35 mg/dl
5.	LDL cholesterol	Up to 150
6.	Ratio (Chol./ HDL)	Below 6

Prognosis of Obesity:

Mortality rate is 25% higher if person is 25% overweight, and 50% mortality if person is 40% overweight.

MATERIALS AND METHODS:**Clinical study:**

- 1. Research Design:** The study was planned as controlled clinical trial.
- 2. Selection of Patients:** All patients were selected from OPD of Kayachikitsa Dept. of our institution according to the inclusion criteria.
- 3. Consent Form:** The separate consent form was printed in two languages i.e. English and Marathi. Before starting treatment each patient was explained about whole treatment pattern and consent was taken.
- 4. Case record form** was prepared.
- 5. Laboratory investigations:** Lipid profile.

6. Equipments: weighing machine, measuring tape etc.

7. Dropouts: Out of 41 patients, 11 patients dropped out due to reasons like discontinuation of treatment and irregularities in follow ups.

Inclusion Criteria:

1. Age group: 20 to 50 years irrespective of sex, socio-economic status and religions.
2. BMI: More than 25.
3. Increased Waist- Hip ratio.

Exclusion Criteria:

1. Age: Patients having age below 20 years and above 50 years.
2. BMI: Patients having BMI below 25.
3. Disease exposure: Patients suffering from diabetes mellitus, renal disease or impairment, cardio - vascular and cerebro-vascular diseases.

4. Hormonal diseases: Patients suffering from diseases of Thyroid gland (Hypothyroidism and Hyperthyroidism), Pituitary gland (Dwarfism, Gigantism and Acromegaly), Adrenal glands (Glucocorticoids and Mineralocorticoids).
5. Patients who were taking steroids containing drugs.
6. Patients who were taking hypolipidemic drugs.
7. Alcoholic abusers.

Diagnostic Criteria:

Patients were diagnosed to have obesity on the basis of,

1. Increased weight with respect to height, age and sex.
2. Increased BMI (Body Mass Index).
3. Increased Waist- Hip ratio.
4. Increased lipid profile

Supportive Laboratory Investigations:

Lipid Profile of each patient before treatment (BT) and after treatment (AT) was done.

Treatment Schedule:

- Form of Drug: Handmade tablet (*Vati*)
- Dose of Drug: 500 mg Bid (twice a day)
- Duration (*Kaal*): *Vyana* - *Udana kaal* i.e. After Lunch & After Dinner
- Vehicle (*Anupana*): Warm Water (*Koshna Jala*)

Follow Up: Total 3 Follow ups were taken. Each follow up was after 15 days.

Duration of treatment:

The total duration of treatment was 45 days.

Criteria for Assessment:

Assessment of clinical trial was done based upon objective parameters. These parameters were-

1. Weight
2. BMI = Weight in Kg/ Square of height in meter
3. Waist- Hip Ratio= waist circum./ hip circum.(in cm)
4. Lipid profile- BT & AT.

Initial observations were recorded before the study & at every follow up. Lab investigations done at 1st and 45th day of the study.

Statistical Analysis:

The observed data were analyzed statically. Unpaired 't' test was used to compare the between two groups i.e. Group A (Observations before Treatment) and Group B (Observations after Treatment).

P value of < 0.05 was considered as statically significant while P value of < 0.01 & 0.001 were considered highly significant.

The obtained results were interpreted as -

Insignificant - $P > 0.05$

Significant - $P < 0.01$ to $P < 0.05$

Highly significant - $P < 0.001$

Paired 't' test:

Paired 't' test is used to work out mean reduction between first and final day i.e. 45th day under study and test is significant. Results obtained are presented in following table. The 't' table value at 5% is 2.045, 1% is 2.756 and 0.1% is 3.66.

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

Table No. 05: Effect on various observations between 1st and 45th day under study

Observations at 1 st and 45 th day	Mean reduction	S.E.	t cal	% Reduction
Weight	0.56	0.09	5.78	0.78%
BMI	0.21	0.04	5.37	0.21%
Waist- hip ratio	0	0	0	0.0%
Total cholesterol	11.73	1.62	7.20	10.54%
Triglycerides	10.62	1.37	7.74	14.46%
LDL	10.03	1.55	6.43	22.51%
HDL	3.58	0.52	6.70	8.94%
Total Cholesterol/HDL ratio	0.16	0.08	7.58	0.13%
LDL/HDL ratio	0.49	0.06	7.33	14.39%
VLDL	3.96	0.69	6.19	29.64%

DISCUSSION:

Mode of action of *Tryushanadi Guggulu*:

Guggulu is the main content of *Tryushanadi Guggulu*. *Guggulu* is *kapha* and *medonashaka*. *Katu*, *Tikta*, *Kashaya rasas*, *laghu*, *ushna*, *tikshna*, *ruksha gunas* collectively act on *meda* and *kapha* in human body.

Goghrita is *snigdha*, *sheet*, *Madhura Vipaki* and *rasayana*. Action of *Goghrita* is *agnivardhaka*, *pittashamak* and having *rasayana* property. *Dipana* property of *Goghrita* increases the *dhatvagni bala*. *Guru*, *snigdha* and *rasayana* properties of *Goghrita* preserve *dhatu bala* and *Oja*.

Triphala: *Haritaki* of *Triphala* is having *Kashaya rasapradhana*, *ruksha*, *laghu*, *ushna* properties and its action of *kapha-medanashana*. *Bibhitaka* is having *Kashaya rasa*, *laghu*, *ruksha* and it acts as *kapha* and *medoghna*. *Amalaki* is having all *rasayana* properties. It regulates excess *rukshata* of the body in *lekhana karma*.

Trikatu: All contents of *Trikatu* are having *laghu*, *ushna*, *tikshna* properties. They increase *bala* of *dhatvagni* especially of *meda dhagvagni*. *Pachana karma* of *apachita meda dhatu* is achieved by *Trikatu*. *Shunthi's Madhura Vipaka* protects *dhatu bala*.

Trimada: *Chitraka* and *Vidanga* are having *laghu*, *ruksha*, *ushna* and *tikshna gunas*. They increase *pachana* of *apachita meda dhatu* along with *dhatvagni bala*. *Mustaka* is *kapha - medonashaka*.

Vacha: *Vacha* is having *katu*, *ushna*, *tikshna gunas*, so it increases *dhatvagni bala* and *pachana* of *apachita meda*.

Vehicle / Anupana: Warm water (*Koshna jal*) was used as an *Anupana* or *vehicle*. It is *laghu*, *agnivardhaka*, *bastishodhak*, *amapachak*, *kaphashamak* and *medohara*. So it enhances action of *Tryushanadi Guggulu* on *Hyperlipidemia* or *Sthaulya*.

Tryushanadi Guggulu causes *lekhana karma* i.e. *karshana* of *dhatu*, so *rukshata*, *kharata*, *vishadata* and *laghuta* are increased in body. It increases *Medadhatvagni bala* causing *pachana* of *apachit meda*. It enhances formation of *supachit meda* lowering increased values of lipids. So it acts as *herbal hypolipidemic agent*.

SUMMARY:

Obesity associated with hyperlipidemia is today's burning problem having large prevalence. Increased lipid profile is key cause of many cardiovascular and

cerebrovascular diseases. *Guggulu kalpana* is one of the best remedy for the same described in classical text. There are three methods of *Guggulu paka* i.e. *Somapaka*, *Analapaka* and *Bhanupaka*. In present study *Tryushanadi Guggulu* was prepared following three *paka* methods at a time.

Patients of Obesity associated with hyperlipidemia treated with *Tryushanadi Guggulu* as a single drug with *Koshna Jala anupana* have shown significant reduction in weight, BMI, total cholesterol, triglycerides and VLDL. Increase in HDL after treatment was due to *medodhatvagnivardhana* and *pachana* of *apachit meda*. *Tryushanadi Guggulu* is effective in hyperlipidemia.

CONCLUSION:

Tryushanadi Guggulu treated patients showed; statistically significant reduction in weight, total cholesterol, triglycerides and LDL / HDL.

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