

An Evidence based Critical analysis of Chavyadi Shaktu in the Management of Stholya in Children

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ABSTRACT

Globally, Obesity & overweight are causing serious public health issues and in many countries threatening the viability of basic health care delivery. During recent decades, there has been a dramatic rise in prevalence of overweight & obesity in children. The prevalence of obesity among school children in India has found between 5.74% and 8.82% and approximately 21.4% of boys and 18.5% of girls were obese in the 13-18 years age group in urban regions of South India. The narrative of *Stholya* mentioned in Ayurveda classics is quite similar to obesity. A person with excessive accumulation of *Meda* (fat/adipose tissue) and *Mamsa* (flesh/muscle tissue) leading to flabbiness of hips, abdomen, and breast has been categorized as *Atisthula*.

Only diet therapy and Physical activity restriction is not sufficient to treat the obese patients, so there is need to give some effective drugs for treatment of obesity. The present paper is focused on *Chavyadi Shaktu* and there dravyas for management of *Stholya*. The paper attributes to the critical review of *Chavyadi Shaktu* to elicit their pharmacological actions based on various experimental and clinical studies.

Keywords: *Chavyadi Shaktu*, overweight, *Stholya*, *Atisthula*, *Meda*, Adipose tissue

INTRODUCTION

Children with *Stholya* face a lot of problems in their day to day activities. Obesity is a condition where a person has accumulated so much body fat, it might have a negative effect on their health and increases the risk of other metabolic disorders such as type 2 diabetes, insulin resistance, hypertension, dyslipidaemia, inflammation, thrombosis, obstructive sleep apnoea, cardiovascular disease, some cancers and mortality.^{1,2} Obesity caused by several factors viz., social and environmental status, genetics factors, and individual preferences like age, gender, high energy and less nutrient diet pattern, regular intake of excess calories and fatty foods, lack of physical activity.³ The changeover of a rural to an urban lifestyle that is a major cause of obesity e.g. increased intake of high energy dense foods and decrease in physical activity. Adults having body mass index (BMI) greater than or equal to 25 and 30 considered overweight and obese, respectively while in the reference of children 85th percentile and 95th percentile of BMI considered overweight and obese, respectively and it is increasing at an alarming rate throughout the globe.⁴ The prevalence of obesity among school children in India has found between 5.74% and

8.82% and approximately 21.4% of boys and 18.5% of girls were obese in the 13-18 years age group in urban regions of South India.^{5,6,7}

Stholya is considered as one of the eight despicable conditions as described by *Acharya Charaka*.⁸ A person with excessive accumulation of *Meda* (fat/adipose tissue) and *Mamsa* (flesh/muscle tissue) leading to flabbiness of hips, abdomen, and breast has been categorized as *Atisthula*.⁹ *Atistholya* considered as one of *Santarpanottha Vikaras* (disease due to regular consumption of excess calories). Consumption of *Guru* (heavy to digest), *Sheeta* (cold), *Snigdha* (unctuous), *Madhuradi Kaphavardhaka* (sweet and *Kapha* increasing) diet along with lack of exercise and sedentary life style result in excessive nourishment of *Medas* while other bodily elements (*Dhatus*) are deprived of nourishment.¹⁰ Obesity and Overweight being the commonest problems in children as well as older age groups, there is a need to combat them with drugs mentioned in classics which may be useful to address the associated conditions of *Stholya*. In this regard, an attempt has been made to critically review the *Chavyadi Shaktu* mentioned in the classical texts which may abet our understanding of prevention and management of the conditions like Obesity and Dyslipidemia.

MATERIAL AND METHODS: Various Ayurveda classics and studies published in journals related to effect of *Chavyadi Shaktu* in *Stholya* are reviewed and analyze.

In present paper *Chavyadi Shaktu* used as treating *Stholya* which are along with their multifactorial functions such as *Deepaniya*, *Pachaniya*, *Pittasaraka*, *Kaphaghna*, *Chedana*, etc. without any adverse effects.

Table no.1- REVIEW OF THE INGREDIENTS OF CHAVYADI SHAKTU

S.No	Name of Drug	Latin name	Family	Useful Part	Quantity	Dose
1.	CAVYA	<i>Piper retrofrctum</i>	<i>Piperaceae</i>	Fruit, Root	01 part	Powder-1-2 gm
2.	SWET JIRAKA	<i>Cuminum cyminum</i>	<i>Umbelliferae</i>	Seed	01 part	Powder -3-6 gm
3.	SHUTHI	<i>Zingiber officinalis</i>	<i>Zingiberaceae</i>	Rhizome	01 part	Fresh juice 5-10 ml, powder 1-2 gm, syrup 2-4 ml
4.	PIPPALI	<i>Piper longum</i>	<i>Piperaceae</i>	Fruit, Root	01 part	Powder - 0.5to1 gm
5.	MARICH	<i>Piper Nigrum</i>	<i>Piperaceae</i>	Fruit	01 part	Powder - 0.5to1 gm
6.	SUDH HINGU	<i>Ferula Narthex</i>	<i>Umbelliferae</i>	Gum Resin (NIRYAS)	01 part	125-500mg
7.	SAUVARCALA LAVAN	-	-	-	01 part	-
8.	CHITARAKAMU LA	<i>Plumbago Zeylanica</i>	<i>Plumbaginaceae</i>	Root Bark	01 part	Powder-1-2 gm
9.	YAVA	<i>Hordeum Vulgare</i>	<i>Gramenae</i>	Seed	-	100-200 gm
10.	MASTU	-	-	-	-	q.s.

Table no.-2

S.N.	DRUG	RASA	GUNA	VIRYA	VIPAKA
1	CAVYA ¹¹	Katu	Laghu, Ruksa	Usna	Katu
2	CITRAKA MULA ¹²	Katu	Laghu, Ruksa, Tiksna	Usna	Katu
3	SWET JIRAKA ¹³	Katu	Laghu, Ruksa	Usna	Usna
4	SHUTHI ¹⁴	Katu	Laghu, Snigdha	Ushna	Madhura
5	HINGU ¹⁵	Katu	Tikshna, Laghu, Snigdh a	Ushna	Katu
6	PIPPALI ¹⁶	Katu	Snigdha, Laghu, Tikshna	Usna(Ardra- Sita)	Madhura
7	MARICH ¹⁷	Katu	Laghu, Tikshna ,Ruksha, Guru(Ardra)	Usna	Katu, Madhura(A rdra)
8	YAVA ¹⁸	Kasaya, Madhura	Ruksa, Guru, Picchila, Mrdu	Sita	Katu
9	SAUVARCAL A LAVAN ¹⁹	Katu	Laghu	Usna	Katu

Table no.3

S. No	Drug	Pharmacological actions	Properties of drug	Chemical composition
1	Cavya	kaphavatahara, Pittavardhaka, Bhedi, Pachana ¹¹	Ayurveda Classics- Triptighna, Deepaniya, Shulprashaman ²⁰ Modern- Stimulants, Carminative, Tonic, Antihypertensive, Muscle Relaxant, Antifungal, Colic ²¹	Stem- Piperine, Pitosterol, Piplartine(alkaloid) New amides-retrofractamide A, B, C&D isolated from aerial parts ²²
2	Chitrakmula	Kaphavatasamaka, Grahi, Deepana, Pachana, Rasayana ²³	Ayurveda Classics- Deepaniya, Pachaniya, Pittasaraka, Kapha ghna, Svedajanana ²⁴ Modern- Appetizer, Skin diseases, Diarrhoea, Dyspepsis, Piles and Anasarca, Excite digestion, Leprosy ²⁵ ; Epilepsy and Hysteria, Nervous affections, Obesity, Prurigo and Indolent ulcers ²⁶	Chitranone, Plumbagin, 3-Chloroplumbagin, Droserone, Elliptinone, Isozeylinone, Isozeylan-one, Zeylanone and Zeylinone, Maritone, Plumbagic acid, Dihydrosterone, β -sitosterol etc ²⁷
3	Swetajirka	Kaphavatasamaka, Pittavardhaka ²⁸	Ayurveda Classics - Tixna, Ushna, Rochana, Pittagnivardhan, Kaphavatahar ²⁹ Modern- Astringent,	Cuminin, Diacyl glycerol, Imperatorin, Isoimperatorin, Isoimpinellin, Oxypeucedanin, Apigenin&Apiin, Oxalic, Cuminaldehyde, P-cymene ³¹

			Aphrodisiac, Cooling, Anthelmintic, Carminative, Hot, Sweet and Tonic ³⁰	
4	Shuthi	Kapha- VataShamaka ³²	Ayurveda Classics- <i>Rochana, Deepan, Trptighna, Vatanulomana, Sothahara</i> ³² Morden- Carminative, Pungent, Stimulant, Antibacterial, Antioxidant ³³	α –curcumene, β –D-curcumene, β –bourbornene, d–borneal, citral, d–camphene, citronellol, geraniol, gingerol, α -& β -zingiberenes, zingiberol, zingerone, gingerols, paradol, gingerone A, ginger glycolipids A, B&C, gingerdiol, gingerone B&C ³⁴
5	Hingu	Kaphavatasamaka, Pittavardhaka ³⁵	Ayurveda Classics- <i>Chedana, Deepan, Anuloman, Vatakaphaprashama</i> ³⁶ Morden- Anthelmintic, Antispasmodic, Aphrodisiac, Carminative, Diaphoretic, Digestive, Diuretic, Emmenagogue, Expectorant, Laxative and Stimulant to Brain, Nervous System and Gastric System ³⁷	Gum-a-pinene, phellandrene, isobutyl propenyl disulfide, a trisulfide, asaresinotannol, farnesiferol A, gummosin, kamolonol, mogoltadone, polyanthinin, polyanthin, undecylsulfonylacetic acid, umbelliferone, Root-foetidin, luteolin, Whole plant-assafoetidin, ferocolicin ³⁸

6	Pippali	Vata-shleshmahara ⁴³	<p>Ayurveda Classics- Rechani, Agnivardhni,Rasayana⁴³</p> <p>Morden-Stimulant, Appetizer, General Tonic, Hematinic⁴⁴</p> <p>Immunomodulatory activity, Stimulant effect, Antiasthmatic activity, Hypocholesterolaemic activity, Anti-inflammatory activity, Antiamoebic activity⁴⁵</p>	<p>Essentialoil,mono and sesquiterpenes, caryophyllene(mainly), piperine, pipartine, piperlongumine, piperlonguminine, Pipernonaline,piperundecalidine, pipericide,sesa-min,β – sitosterol,four aristolactams(cepharanone B,aristolactams(cepharanone B,aristolactum AII,piperlactum A and piperolactam B) five 4,5- dioxoaporphines</p>
7	Marich	Vatakaphasamaka, Pittakara(Shushka) ³⁹	<p>Ayurveda Classics- Laghu, Rochana, Chedana, Deepan, Kaphavatjit⁴⁰</p> <p>Modern-Anti- bacterial, Anti-inflammatory, Anti-oxidant, Anti-carcinogenic, Immunomodulatory, Analgesic, Anti-viral⁴¹⁻⁴⁵</p>	<p>Piperene,Piperethine,piperoleinA&B,feruperine,dihydroferuperine,citronellol,ryptone,dihydrocarveol,α & β –pinene, piperonal,camphene,β – caryophyllene, β – alanine,pipecolic acid,carotene,ascorbic acid,pipericide⁴⁶</p>
8	Yava	Vatakr, Pittahara, Kaphahara, Medahara, Balya, Vrsya, Svarya,Varnya,	<p>Ayurveda Classics- Madhur, Sheeta, Kapha-Pittanashak⁴⁸</p> <p>Modern -Appetizer, aphrodisiac,</p>	<p>Starch, Sugars, Fats, Proteins (Albumin, Globulin, Prolamin and Glutinin) also contains Flavone Glycosides viz, Orientoside, Orientin, Vitexin</p>

		<i>Sthairyakara, Purisakrt, Mutrahara, Lekhana, and Kanthya, Kasahara, Agnivardhana, Abhisyandi, Chardinigrahana</i> ⁴⁷	anthelmintic, carminative, laxative, pungent and stomachic, abdominal tumours, spleen enlargement, piles, vomiting, toothache ⁴⁹	etc. ⁵⁰
9	<i>Sauvarca lalavan</i>	<i>Usnavirya</i> , alleviates gulma, colic and constipation, is agreeable, aromatic and relishing ⁵¹	Diffusive, liquifacient, digestive, inductive of defluxion, depletive and distructive, avoids accumulations and obstructions, stiffness and curative of <i>Vata</i> , laxative, overpowers the rest of the tastes and increases the secretion of mouth. It liquefies the mouth secretion, clarifies the passage, softens all the limbs of the body, gives relish to food, is always used in food, is neither very heavy(to digest) nor very unctuous and is hot. ^{52,53}	NaCl It is a dark coloured salt made by dissolving common salt in solution of 'saimati (crude oda) and evaporating it. This salt contains chloride of sodium, sulphate of soda, caustic soda but no carbonate soda. ⁵⁴
10	<i>Mastu</i>	Alleviates <i>kapha</i> and <i>vata</i> ⁵⁵	<i>Laghu</i> , increases strength, creates desire for food,	

			relishing, alleviates fatigue, thirst, <i>kapha</i> and <i>vata</i> , cleanses the micro-channels and removes the accumulated faeces ⁵⁶	
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Therapeutic evaluation and related research Studies -

Cavya

Piper chaba fruit extract significantly reduced cholesterol and LDL level while elevating HDL levels. It has been reported earlier that fruit of *Piper chaba* possesses cholesterol lowering properties. Piperidine alkaloids including piperine, pipernonaline and dehydropipernonaline are responsible for producing this effect by activating AMP-activated protein kinase that regulate lipid metabolism⁵⁷.

Chitrakamula

1. Pharmacological and Clinical studies carried out by Sharma et al.⁵⁸ indicated that *Plumbago Zeylanica* extract has hypolipidaemic and antiatherosclerotic activities. Plumbagin, an active principle isolated from *Plumbago Zeylanica* brings about a definite regression of atherosclerosis and prevents the accumulation of cholesterol and triglycerides in liver and aorta.

2. “Panchcole” an *Ayurvedic* formulation containing *Plumbago Zeylanica* as one of its chief ingredients has been advocated to produce hypolipidaemic effect⁵⁹

Swetjiraka

The *Cumin* seed extract showed contain hypolipidemic effect by reducing plasma cholesterol, low-density lipoproteins, and triglycerides level. While toxicological studies suggest no adverse effect on renal and liver function tests, hematological parameters were also observed in a normal range. Histological analysis showed that cholesterol administration caused a narrowing of the aortal lumen while treatment with 70% EtOH and atorvastatin decreased the plaque size and restored the luminal size of the aorta to normal⁶⁰.

Shuthi

Ginger(*Z.officinale*;1% w/w) significantly lowers lipid peroxidation by maintaining the activities of the antioxidant enzymes-superoxide dismutase, catalase and glutathione peroxidase in rats. The blood glutathione content is significantly increased in *Ginger* fed rats. Similar effects are also observed after natural antioxidant ascorbic acid (100mg/kg,body wt.) treatment. The results indicate that *Ginger* is comparatively as effective as ascorbic acid as an antioxidant⁶¹.

Hingu

1. Essential oil showed significant protective action against fat-induced increase in plasma fibrinogen and decrease in coagulation time and fibrinolytic activity on alimentary hyperlipidaemia. Serum cholesterol was also slightly lowered⁶²
2. The aqueous extract of Asafoetida shown the hypoglycaemic activity in STZ-diabetic rats⁶³

Pippali

1. The lipid-lowering effect caused by feeding with *Piper longum* extract, as in the case of guggulipid, may be due to an early clearance of lipids from circulation in triton model and it may be due to reactivation of lipolytic enzymes as evidenced by increased plasma PHLA⁶⁴.
2. Triton WR- acts as a surfactant and suppresses the action of lipases to block the uptake of lipoproteins from circulation by extra hepatic tissues resulting in increased blood lipid concentration⁶⁵

Marich

1. Piper nigrum Linn. fruits ingestion increases the efficacy of Atorvastatin by inhibiting intestinal CYP3A4 enzyme in albino wistar rats⁶⁶.
2. Piperine reduced body weight gain, lowered TC and fully normalised TG, restored endothelial-mediated vasorelaxation of aorta and acts in the post-absorptive stage. Thus Piperine could provide beneficial effects in weight control, antihyperlipidemia and vascular endothelial function⁶⁷.
3. Piperine, has a wide range of Pharmacological effect, including antioxidant, anti-bacterial, anti-proliferative and anti-tumor, and cholesterol-lowering properties⁶⁸

Yava

The antiobesity activity of barleygrass juice and nutraceutical effect in the management of obesity⁶⁹

Mastu

1. Studies in the last few years also suggested that eating non-fat and low-fat yogurt can aid weight loss⁷⁰
2. Whey protein has a positive effect on lipid and antioxidant status to minimize the oxidative stress due to exposure to γ -irradiation⁷¹

DISCUSSION: The components of the study drug might have acted at various levels in breaking the pathogenesis of the Stholya. The lipid-lowering effect caused by feeding with *Piper longum* extract, as in the case of guggulipid, may be due to an early clearance of lipids from circulation in triton model and it may be due to reactivation of lipolytic enzymes as evidenced by increased plasma PHLA⁶⁴. The *Cumin* seed extract showed contain hypolipidemic effect by reducing plasma cholesterol, low-density lipoproteins, and triglycerides level. While toxicological studies suggest no adverse effect on renal and liver function tests, hematological parameters were also observed in a normal range. Histological analysis showed that cholesterol administration caused a narrowing of the aortal lumen while treatment with 70% EtOH and atorvastatin decreased the plaque size and restored the

luminal size of the aorta to normal⁶⁰. Piperine, has a wide range of Pharmacological effect, including antioxidant, anti- bacterial, anti- proliferative and anti-tumor, and cholesterol-lowering properties.⁶⁸ The antiobesity activity of barleygrass juice and nutraceutical effect in the management of obesity⁶⁹

Conclusion:

From the above review it is evident that *Chavyadi Shaktu* has shown cholesterol-lowering properties, antiobesity and weight reduce activity so it is concluded that the *Chavyadi Shaktu* can be used as an effective antiobesity remedy.

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