Review on Obesity treatment in Ayurvedic, Homeopathic, Allopathic, and home remedies.

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ABSTRACT:
Obesity, a complex interplay between environmental and genetic factors and is associated with significant morbidity and mortality. Usage of herbs for the management of obesity in the recent times is attracting attention. A web and manual based literature survey was conducted to assess the amount of information available on the herbal products for weight management. Traditional literature, PubMed, Scopus, Google scholar databases were screened up to February 2012. The search words were “obesity”, “herbal medicine/products/extracts”, “medicinal plants”, “traditional medicine”, Obesity in adults is characterized when the Body Mass Index (BMI) is greater than or equal to 30. It is estimated that 1.7 billion people in the world are overweight or obese, and more than one third of U.S. adults (35.7%) are obese. There are a variety of factors that play a role in obesity, such as behavior, environment, and genetic factors. Usual countermeasures include adequate physical activity, avoidance of calorie-dense foods, and use of certain drugs for promoting weight loss. Surgery is an extreme measure and anyone considering it must have failed consistently in losing weight through lifestyle changes and less invasive methods. The main drugs currently employed in obesity treatment present dangerous side effects, namely: elevation of blood pressure, insomnia, constipation, headaches, among others. For this reason, a wide variety of natural materials have been explored for their obesity treatment potential. Considering that natural anti-obesity products have different mechanisms, the recommended approach to research a more effective obesity treatment, reaching the associated synergistic effects, must involve the combination of natural products and/or products with multiple activities. This chapter describes several natural products with anti-obesity activity, and active components and mechanisms of action to combat obesity.

Keywords: anti-obesity activity, metabolic syndrome, natural products, obesity

INTRODUCTION:
Obesity is a medical condition in which excess body fat has accumulated to the extent that it may have a negative effect on health. Today, more than one in two adults and nearly one in six children are overweight or obese in the OECD area. The obesity epidemic has spread further in the past five years, although at a slower pace than before. Despite this, new projections show a continuing increase of obesity in all studied countries. Social disparities in obesity persist and have increased in some countries. According to World Health Organization (WHO) report more than one billion people around the world are identified as overweight. In India, more than 3% of people are diagnosed as obese. Earlier obesity was distressing the people of developed countries, but now days it has become a more serious concern in developing countries and underdeveloped countries too. Obesity is a complex disease caused by the interaction of a
myriad of genetic, dietary, lifestyle, and environmental factors, which favors a chronic positive energy balance, and leads to increased body fat mass. The incidence of obesity is rising at an alarming rate and is becoming a major public health concern with incalculable social costs. Indeed, obesity facilitates the development of metabolic disorders such as diabetes, hypertension, and cardiovascular diseases in addition to chronic diseases such as stroke, osteoarthritis, sleep apnea, some cancers, and inflammation-based pathologies. Both lifestyle and pharmacotherapy interventions have been considered by physicians and other health care professionals as obesity treatment modalities. Studies show that only 5-10% subjects can maintain their weight loss over the years. The complex pathogenesis of obesity indicates the need of different intervention strategies to confront this problem with a simple drug therapy which is more acceptable to patients. Disappointing results, after cessation the lifestyle modification or pharmacotherapy indicated the need of other treatment modalities to produce better and long-lasting results, in terms of weight loss. Herbal supplements and diet-based therapies for weight loss are among the most common complementary and alternative medicine [CAM] modalities. A vast range of these natural products and medicinal plants, including crude extracts and isolated compounds from plants can be used to induce weight loss and prevent diet-induced obesity. In the recent decades, these have been vastly used in management of obesity due to containing a large variety of several components with different anti-obesity and anti-oxidant effects on body metabolism and fat oxidation. Medicinal plants have been investigated and reported to be useful in treatment of obesity, diabetes and other chronic diseases.

**Adults**

For adults, WHO defines overweight and obesity as follows:
- Overweight is a BMI greater than or equal to 25; and
- Obesity is a BMI greater than or equal to 30.

BMI provides the most useful population-level measure of overweight and obesity as it is the same for both sexes and for all ages of adults. However, it should be considered a rough guide because it may not correspond to the same degree of fatness in different individuals.

For children, age needs to be considered when defining overweight and obesity.

**Children under 5 years of age**

For children under 5 years of age:
- overweight is weight-for-height greater than 2 standard deviations above WHO Child Growth Standards median; and
- Obesity is weight-for-height greater than 3 standard deviations above the WHO Child Growth Standards median.

**Children aged between 5–19 years**

Overweight and obesity are defined as follows for children aged between 5–19 years:
- overweight is BMI-for-age greater than 1 standard deviation above the WHO Growth Reference median; and
- Obesity is greater than 2 standard deviations above the WHO Growth Reference median.
Definition and Epidemiology

Calculating body mass index (BMI), also known as the body mass index is defined by dividing the mass (Kg) by the square of the height (m) – it is the epidemiological indicator for the diagnosis of overweight and obesity. According to the adapted classification by the World Health Organization (WHO), obesity is defined by a BMI greater than or equal to 30 Kg/m2. The presence of overweight or obesity increases the risk of comorbidities, there is an association between BMI and mortality or chronic diseases. The definition of infant obesity is more complicated and the IMC also change with height and age. Obesity is considered when the percentage above 95% of BMI for age and sex. Excess fat can be located in the abdominal area, which is defined as android-type obesity, central obesity, abdominal obesity or apple shaped, showing a high risk of cardiovascular complications when compared to gynecoid obesity, inferior obesity, peripheral obesity, gluteal-femoral (i.e. the pear shape) which the fat is concentrated in the region of the hips.

TABLE 1: Classification of obesity according to BMI (Kg/m2) and the risk of disease

<table>
<thead>
<tr>
<th>BMI (Kg/m2)</th>
<th>Classification</th>
<th>Class of obesity</th>
<th>Risk of disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;18,5</td>
<td>Underweight</td>
<td>-</td>
<td>High</td>
</tr>
<tr>
<td>18,5-24</td>
<td>normal weight</td>
<td>-</td>
<td>Normal</td>
</tr>
<tr>
<td>≥25</td>
<td>Overweight</td>
<td>-</td>
<td>little high</td>
</tr>
<tr>
<td>25-29,9</td>
<td>class I obesity</td>
<td>I</td>
<td>moderate risk</td>
</tr>
<tr>
<td>35,0-39,9</td>
<td>class II obesity</td>
<td>II</td>
<td>high risk</td>
</tr>
<tr>
<td>≥40</td>
<td>class II obesity</td>
<td>III</td>
<td>very high risk</td>
</tr>
</tbody>
</table>

DIAGNOSING OVERWEIGHT/OBESITY

Body Mass Index (BMI): Overweight and Obesity are assessed using Body Mass Index (BMI). It is defined as a person's weight in kilograms divided by the square of his / her height in meters (kg/m2).

CAUSES OF OVERWEIGHT/OBESITY

- Increased intake of energy-dense foods that are high in fat, carbohydrates
- Overeating and Irregular food habits
- Lack of Physical activities due to sedentary lifestyle
- Genetics, endocrine disorders, Medical Reasons or Psychiatric illness
- Day – time sleeping

SYMPTOMS:

1. Breathlessness even on little exertion / physical activity.
2. Lack of interest in doing work.
3. Profuse sweating with foul body odor.
4. Excessive hunger.
5. Feeling of tiredness.
6. Excessive sleep

**Ayurveda:**

In *Ayurveda*, *Atisthauyã* (Obesity) is described as excessive accumulation of *Meda* (fat/adipose tissue) and *Mamsa* (flesh/muscle tissue) leading to flabbiness of hips, abdomen, and breast. It is considered as one of *Santarpanotha Vikaras* (disease due to consumption of excessive calories) in Ayurveda. *Medodushti* (disorders of fat metabolism) may be one of the risk factors for Ischemic Heart Disease (IHD).

**AYURVEDIC MANAGEMENT LINE OF TREATMENT**

(Under strict supervision of Registered Ayurvedic Physician) *Shamana* (Palliative) treatment:

- Langhan (Fasting),
- Ama pachan (oral use of digestives to augment the fat metabolism),
- Ruksha Udwartan (Dry medicated powder massage),
- Heavy and non-nourishing diet/items like Honey, salad etc are advised.
- Physical exercises, mental work is also recommended.

*Samshodhana Chikitsa* (Purificatory procedures): Panchakarma

1. Vaman (Therapeutic emesis),
2. Virechan (Therapeutic purgation),
3. Lekhan vasti (Medicated enema) are advised for the management of Sthaulya.
4. Single drugs: Guduchi, Vidanga, Musta, Sunthi, Amla, Vaca, Daruharidra, Guggulu, etc.

6. **LEADING HOMOEOPATHIC MEDICINES FOR TREAT OBESITY:**

1. **AMONIUM CARB.**

Fat patients with weak heart. For women who are tired and weary and take cold easily and lead a sedentary life. Dry coryza and stoppage of the nose, chiefly at night, with danger of suffocation. With long continued coryza, can only breathe through the mouth. Women with premature and too copious menses, with emission of black and acrid blood. Sadness, with disposition to weep. Timidity of character. Disgust with life. Needlesness. Great absence of mind and weakness of memory. Vertigo, on reading in a sitting posture. Chilly patient with great sensitiveness to cold open air, < in wet, stormy weather; from washing; > by warmth.

2. **AMMONIUM MUR.**

In case the body is fat and legs are thin. With large buttocks. Full of grief, but cannot weep. Irritability and disposition to be angry. Very severe ulcerative pain in the heel, > by rubbing. The feet get very cold in the evening in bed.

3. **ANTIMONIUM CRUDUM.**

Children and young person with tendency to grow fat with coated moist white tongue. The subject needing this remedy may belch a great deal, and the eructations may taste of the ingesta. Bloating after eating. < By heat is a marked characteristic. The symptoms are < in the heat of the Sun. Nails discoloured and deformed. Corns and callous excrescences on the feet. Alternate diarrhøæ and constipation especially in aged persons.

4. **AURUM METALLICUM.**

Fat patients with Arteriosclerosis and high blood pressure. With fatty degeneration of heart. Patients with melancholy, hopelessness, profound depression, tendency to suicide and longing for death. Pain in heart region extending down left arm to fingers. Chilliness predominates; coldness of hands and feet, sometimes lasting all night.

5. **CALCAREA CARBONICA.**

This is the main remedy for reducing obesity. The characteristic symptom is sweating on the forehead which wets the pillow when sleeping. It should be given in 200 potency with weekly repetition. This can be prescribed to obese children also. The patient’s hand is soft, warm, and moist; a boneless hand with clammy feet. Great sensitiveness to cold, damp air. Dread of
bathing and water. Great weakness on ascending, on walking and talking.

6. CALOTROPIS GIGANTEA.
This medicine is helpful in reducing the obesity without decreasing the weight i.e. flesh will be decreased, the muscles will become harder and firmer. Heat in stomach is a good guiding symptom.

7. CAPSICUM.
It is particularly suited to people who are weak of lax fiber and who have little vital heat. The digestion is poor and they suffer from myalgia (aching and jerking of muscles). They have burning pains but hate the cold. Often indicated in old people who have exhausted their vitality. This remedy is very suitable for children also. The mental state shows home-sickness. > From heat is the most important modality.

8. CARLSBAD.
Its chief fame has been gained by its action on the liver, and in the treatment of obesity and diabetes. Sensitiveness to cold air; great liability to take cold. Sweats more easily. > In open air; on motion. The breath smells offensive, the tongue is white and feels furry. The patient is self-satisfied, very talkative and uncomromodly good-humoured. Discouraged and anxious about domestic duties. Absent-minded; heedless; forgets names.

9. ESCULENTINE.
One of the great fat reducers. May be alternated with Phytoline. Both remedies should be used in mother tincture.

10. FERRUM METALLICUM.
Obesity with anemia, face puffy with pitting of flesh. This remedy is recommended to children also. Delicate girls, fearfully constipated, with low spirits. The pulse of the patient is full and yielding. < From eating eggs. This remedy should be given carefully in hemorrhagic phthisis, as it may aggravate. Rheumatic symptoms, especially of left shoulder and deltoid.

11. FUCUS VESICULOSUS.
It is given when Calcarea Carbonica fails. It should be given in drop doses of mother tincture. It is very effective in cases of indigestion, obstinate constipation and flatulence. It is suitable to people with enlarged thyroid glands. Goitre has been cured with it.

12. GRAPHITES.
Obesity in females with delayed menstruation. Indicated for fair, fat, chilly, constipated people who have skin trouble. Helpful to those who have lost desire for sex.

13. KALI BICHROMICUM.
It is especially suited to fair-haired, fat persons, especially fat, chubby children; fat, sluggish people. Gastric symptoms supersede rheumatic symptoms. Liability to take cold in the open air. Great debility, with desire to lie down.

14. KALI CARBONICUM.
This remedy is especially good for older fat people who are characterized by sweat, backache and weakness. This remedy should be used cautiously in Bright's disease and Tuberculosis. This remedy is for dark haired persons of lax fibre and inclined to be fat.

15. PHYTOLACCA BERRY.
One of the effective weight and corpulence reducing remedies.

TREATMENT OF Obesity in Allopathic:
List of drugs used to treat the medical condition called Obesity

Generic and Trade Names of Drugs for Treatment of Obesity

a. Atorvastatin
Atorvastatin is an HMG-CoA reductase inhibitor, also known as "statin", prescribed for hyperlipidemia.

Trade Names :
Inovas -F | TG-Goal | Atamra F | Atorva -TG | Diplitor | Tonact TG | Axigrel AT | Lipikind -AM | Eze AM | Zivast -AM

b. Benzphetamine
Benzphetamine is an anorectic agent, prescribed for obesity.
c. **Bezafibrate**
Bezafibrate is a fibrate drug, prescribed for high cholesterol in blood.

**Trade Names:**
Globez | Beza XL (F/C) (SR) | Beza -XL | Bezalip | Bezalip (400 mg) | Fenolip | Bezalip (200mg) | Bezalip (400mg)

d. **Diethylpropion**
Diethylpropion is an appetite suppressant, prescribed for obesity.

e. **Ezetimibe**
Ezetimibe is a lipid-lowering agent, prescribed for hypercholesterolemia.

**Trade Names:**
Mibe | Ezedoc | Ezee | Ezentia | Ezerem | Ezetib | Ezibloc | Ezta | Ezzicad | Filet

f. **Fenofibric Acid**
Fenofibric Acid is used to reduce the cholesterol in patients with obesity problem. It is a HMG-CoA reductase inhibitor (statin). It slows the production of cholesterol in the body.

**Trade Names:**
Inovas -F | Genxvast -F | Stator -F | Zivast F | Orvaz -FT | Atchol F | Fibrovas | Atornet F | Redustat -Plus | Lorlip -LS

**Home remedies for obesity.**

**Lemon Juice**
Lemon juice is one of the best home remedies for fighting obesity. It is rich in fiber, vitamins like vitamin B and C, minerals including calcium, magnesium, iron, zinc, and phosphorus.

It helps improve digestion and aids in detoxification. Healthy digestion is an essential pre-requisite for weight loss as it helps your body get the nutrients required to burn fat. The citric acid present in lemons is very effective in burning fat.

Furthermore, it helps remove toxins from your body that slow down your metabolism. A recent study published in the journal of Nutrition Research in 2015 showed that a lemon detox program was very effective in reducing fat and insulin resistance in a group of overweight Korean women in comparison to the control group.

**FIG:-3**

1. Mix three teaspoons of lemon juice, one teaspoon of honey, and one-half teaspoon of black pepper powder in one glass of water. (If you use freshly ground black pepper, then just add a quarter teaspoon.)
2. Drink it in the morning on an empty stomach.
3. Do this daily for at least three months.
Alternatively, you can simply have a cup of warm water mixed with a teaspoon of lemon juice.

**Apple Cider Vinegar**
Raw, unfiltered apple cider vinegar is another popular home remedy to reduce excess weight. Though the actual weight loss benefits of it are still unknown, preliminary research has shown that it can help protect against obesity.

**FIG:-4**
Apple cider vinegar (ACV) was found to decrease cholesterol in animals fed high cholesterol diet in comparison to the controls in animal models. The use of vinegar as part of a healthy diet can in the long run help in weight loss and diabetes. It helps break down fat and hence prevents the accumulation of body fat.

- Mix two teaspoons of raw, unfiltered apple cider vinegar in a glass of water. Drink it daily in the morning and preferably before meals.
- You can also drink a glass of water mixed with one teaspoon each of raw, unfiltered apple cider vinegar and lemon juice.

You can have up to two tablespoons of apple cider vinegar in a day. Do not exceed this amount, as it may reduce your blood potassium levels over time and lower your bone mineral density.

**Aloe Vera**

*Aloe vera* is useful in treating obesity because it stimulates metabolism, increases energy consumption, and mobilizes unused fat in the body.

*Aloe vera* contains more than 75 different biologically active substances. This plant has been used in traditional medicine for wound healing, anti-inflammatory activity, antiseptic properties and also as a laxative.

A study done in 2008 showed that phytosterols isolated from *Aloe vera* was effective in reducing body fat accumulation in obese diabetic animal models.

**Green Tea**

Green tea is another popular natural remedy to promote weight loss. Green tea is rich in polyphenols like epigallocatechin gallate (EGCG), epigallocatechin, and epicatechin gallate which are beneficial for health.

![Green Tea](image)

A study at Penn State revealed that epigallocatechin-3-gallate (EGCG), a compound found in green tea, helps slow down weight gain by limiting fat absorption and increasing the body’s ability to use fat.

Another report from Penn State showed that decaffeinated green tea along with exercise helped in achieving weight loss in mice.

While another study published in 2009 showed that the catechins present in green tea had a small positive effect on weight loss and weight management.

Furthermore, green tea is packed with nutrients such as vitamin C, carotenoids, zinc, selenium, chromium, and other trace minerals.

Drink about three to four cups of green tea daily to combat obesity. You can also combine it with ginger tea or cayenne pepper.

**Cayenne Pepper**

Cayenne pepper helps control obesity and aids in weight loss. It contains capsaicin that stimulates your body to burn fat and increase energy expenditure.
Other than capsaicin, chilies have vitamin C, β-carotene, and lutein which are well-known antioxidants.

A review paper published in 2012 looked into the potential medicinal uses of capsaicinoid compounds in relation to the regulation of weight. Capsaicinoids were found to increase energy expenditure, lipid peroxidation, and also reduce the appetite.

In addition, it stimulates digestion and suppresses excess appetite caused by malabsorption of nutrients in the body.

1. Make cayenne pepper tea by pouring a glass of hot water over cayenne pepper (start with one-tenth of a teaspoon or just a dash of cayenne pepper and gradually increase its quantity to one teaspoon). Squeeze the juice from half a lemon in it. Drink this tea regularly at least for a month.

2. Mix two tablespoons each of lemon juice in 10 ounces of water (one glass contains 8 ounces). Stir in a dash of cayenne pepper and drink it.

3. Use cayenne pepper and other spices, such as ginger, black pepper, and mustard seeds, generously in your meal preparations.

4. Curry Leaves

Eating 10 fresh curry leaves daily in the morning works as a great Ayurvedic remedy to deal with obesity and diabetes caused by obesity.

Curry leaves, which are lavishly used for garnishing and flavoring dishes, are rich in proteins, carbohydrates, fiber, minerals, carotene, nicotinic acid, vitamins A and C, calcium and oxalic acid.

It is a rich source of biologically active compounds like koenigin, girinimbin, koenidine, triterpenoids etc.

The leaves are traditionally used for its stomachic, tonic, antihelminthic, antidiabetic, antidiarrheal, and carminative properties.

Tomatoes

Tomato is an excellent natural medicine bursting with goodness that can help you in your battle against obesity. Tomato is rich in vitamin A and C, potassium, phosphorus, magnesium, and iron that are required for normal activity of nerves and muscles.
Lycopene, the pigment responsible for the bright red color of tomatoes, is very beneficial for the body. It works as a powerful antioxidant that neutralizes damage by free radicals to cells in the body. Other biological constituents of tomatoes include coumaric acid and chlorogenic acid. They fight cancer by blocking powerful carcinogens like nitrosamines. Tomatoes also have anti-inflammatory and antithrombotic properties. The bioavailability of lycopene and other nutrients increases upon cooking and processing.

Campari tomatoes which contain very high amounts of lycopenes, were shown to lower lipid levels in diet-induced obese zebrafish models in a paper published in 2011.

Eat a couple of tomatoes every morning on an empty stomach. Make sure you eat the peels and seeds as well because they contain dietary fiber. Tomatoes contain compounds that tend to alter the levels of hormones that affect your appetite.

Furthermore, being rich in vitamins A, C, and K, and magnesium, manganese, choline, folate, and other nutrients, they are good for your health. Also, they are packed with antioxidants that protect against cancers.

**Cabbage**

Cabbage has been used as a remedy for weight loss and obesity. Being a cruciferous vegetable, it contains phytochemicals that help improve the imbalance of estrogen metabolism.

The members of Brassicaceae are a rich source of ascorbic acid, phenolic compounds, carotenoids and glucosinolates.

**Fennel**

Fennel seeds are believed to be useful in weight loss because of their diuretic properties. Fennel seeds have that wonderful aroma around them, which make them great for flavoring dishes.

The major compounds of fennel include essential oil, fatty acid, phenylpropanoids, monoterpenoids, sesquiterpenes, coumarins, tannins, flavonoids etc.

The biological properties of fennel are attributed to its volatile and non-volatile compounds in it. It is useful for the treatment of stomachic, analgesic, anti-inflammatory and antioxidant properties.

A diet of fennel seeds was shown to improve weight loss and decrease leptin (a hormone linked to body weight) concentration in obese animal models in a study published in 2017. Diuretics help you lose weight quickly by reducing water retention. They do not cause long-term weight loss though.

**Conclusion**

Pharmacological interventions in addition to lifestyle changes (diet and physical activity) and in some cases behavioural modifications are used to promote weight loss. At present, only two drugs are currently approved and available for the long-term treatment of obesity—orlistat and sibutramine. However, there are several drugs and combination drug therapies undergoing Phase
III trials that may be approved in the next few years. Pharmacotherapies have demonstrated a significant though modest decrease in weight compared to placebo over 1-2 years. Unfortunately weight loss following pharmacological intervention is not sustained when therapy is discontinued with individuals regaining some or all of the weight that was originally lost. There are several plants described in ayurveda for weight management. But so far, no systematic and well designed screening is attempted to come up with an effective herbal weight loss product. A better understanding in the existing evidence based science on herbs will further guide a qualitative research in obesity management that will attract the end users by the effective benefits. True randomized, double blinded, placebo-controlled clinical trials using herbal products will demonstrate their poten-tial benefits. Significant weight loss after placebo subtraction along with known mechanism of action are re-quired in order to generate conviction amongst users as effective agent for weight management.

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