

Systematic Study on Medicinal Plants Showing Anti-obesity Activity: A Review.

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ABSTRACT

Obesity is a global health problem. It is an energy in balance disorder in which nutrient intake chronically exceeds expenditure, resulting in excessive white adipose tissue accumulation. In this we conclude 10 local plants & many other plants will show anti-obesity natural ingredients & medicinal plant preparation may enhance satiety, boost metabolism & speed up weight loss. Natural supplements products primarily helping consumers to fight the battle against obesity have been widely explored, a variety of natural plants, functional compounds have been used in different anti-obesity products. In this study, the anti-obesity effects of different dietary or herbal products, & their active ingredients & mechanisms of action obesity will be discussed.

Key Words: Obesity, Medicinal plant, Herbal products, Anti-obesity.

Introduction

The word obesity comes from the Latin *obesitas*, which means stout, fat or plump. Medically, obesity is a condition in which body fat has accumulated to the extent that it may have an adverse effect on health, leading to reduce life expectancy and increased health problem⁶. Obesity is a chronic disorder caused by an imbalance between energy intake and expenditure¹. By 2005, obesity has affected 400m adults and since 1997 WHO cited obesity a global epidemic. According to WHO, obesity is related to cardiovascular disease, hypertension diabetes, gallbladder disease². The natural supplement products primarily helping consumer to fight the battle against obesity have been explored. A variety of natural plants, functional fatty acid and other natural dietary compound have been used in different anti-obesity product. Obesity is the most Rampant Nutritional Disease³. Obesity is Frequently Associated with insulin resistance. Adipocytes are key inducer of insulin resistance⁴. Obesity is now among the leading Factors for global morbidity and mortality and causes more global deaths than underweight⁵.

Material & Method

Data were acquired from various data bases including science direct, pub-med web of science & these for the period from 2012-2019.

Causes Of Obesity

Diet

Obesity rates in the US (1971–2000) increased from 14.5% to 30.9% during the same period, there was an increase in the average amount of food consumed (average increase for women 335 and 168 cal. /day). Most of this extra food energy was due to the increase in carbohydrates rather than fat consumption

Sedentary lifestyle

There is a large shift toward less physically demanding work worldwide. Currently, at least 60% of the world's population gets insufficient exercise, due to increased use of mechanized transportation and a greater prevalence of labor-saving technology at home⁷. The WHO indicates people worldwide are taking up less active recreational pursuits. In both children and adults, there is an association between television viewing time and the risk of obesity⁸.

Genetics

Like many other medical conditions, obesity is the result of interplay between genetic and environmental factors. Polymorphisms in various genes controlling appetite and metabolism predispose to obesity when sufficient food energy is present. People with two copies of the FTO gene (fat mass and obesity associated gene) have been found on average to weigh 3–4 kg more and have a 1.67 fold greater risk of obesity compared to those without the risk

allele(9). Some cases of obesity are related to single-gene mutations, e.g. melano-cortin-4 receptor (MC4R) gene²⁸, dopamine receptor D4 (DRD4)¹⁰, peroxisome proliferator-activated receptor γ 2 (PPAR γ 2) or the leptin genes¹¹.

Medical and psychiatric illness

Certain physical and mental illnesses and medications used to treat them can increase the risk of obesity. Medical illnesses that increase obesity risk include several rare genetic syndromes (Cohen syndrome), as well as some congenital or acquired conditions: hypothyroidism, growth hormone deficiency¹², and eating disorders (binge eating disorder and night eating syndrome). The risk of overweight and obesity is higher in patients with psychiatric disorders than in persons without psychiatric disorders¹³.

Effect on human health

In addition to mechanical effect on the body because of extra weight placed on the skeleton, obesity is associated with the higher incidence several pathologist.

1. Hypertension

Epidemiological studies have demonstrated that 65–75% of the risk of hypertension is accounted for by obesity. Endocrinological studies of the adipose tissue revealed links between obesity and hypertension, likely consequent to the fact that the adipose tissue secretes bioactive molecules and immunomodulatory¹⁴.

2. Diabetes mellitus

Accumulated data demonstrate the association between obesity and noninsulin-dependent diabetes mellitus, which is the most common primary form of diabetes and impaired glucose tolerance. In obese individuals, adipose tissue releases high amounts of non-esterified fatty acids, glycerol, pro-inflammatory cytokines, and hormones. They are linked with the development of insulin resistance, which generate compensatory hyperinsulinemia with overstimulation of pancreatic cells and reduction of insulin receptors¹⁵.

3. Cardiac alterations

Obesity increases the risk of heart failure, sudden cardiac death, angina or chest pain, and abnormal heart rhythm¹⁶. Increased electrical alterations in obesity lead to frequent ventricular dysrhythmias even in the absence of heart dysfunction. The annual

sudden cardiac death rate was nearly 40 times higher in obese people than in non-obese population¹⁷.

5. The metabolic syndrome

Obesity is the major component of the metabolic syndrome (multiple metabolic disorders). This syndrome is characterized by the co-occurrence of multiple metabolic disorders, namely overall and abdominal obesity, insulin resistance, hypertension, hyperglycemia, impaired glucose tolerance, and the combination of low HDL cholesterol and elevated TG level¹⁸.

6. Lung diseases

Obesity is associated with an increased risk of chronic respiratory disorders (e.g. asthma, hypoventilation syndrome, and sleep apnea). Accordingly, weight loss often leads to symptomatic improvement¹⁹.

7. Cancer

The link between diet, obesity, and cancer is not completely understood, but the rising world-wide trend in obesity and cancer might be at least in part causal. The putative cause of these obesity-related cancers has been primarily ascribed to excess estrogen production by the adipose tissue, inflammation due to adipocytokines secreted by adipocytes, infiltrating macrophages or associated stromal cells that might also play an important role^{20, 21}.

8. Neurological disorders

Psychological damage caused by overweight and obesity ranges from lowered self-esteem to frank clinical depression. Indeed, rates of anxiety and depression are three to four times higher among obese individuals²². Obesity significantly increases the risk of Alzheimer's disease. A strong correlation exists between BMI and high levels of amyloid, i.e. the protein that accumulates in the Alzheimer's brain, destroying nerve cells and producing cognitive and behavioral problems²³.

Plants used as an alternative for Obesity

Herbal supplements and diet based therapies for weight loss are among the most common complementary and alternative medicine modalities. Different plants contain a large variety of several components with different antiobesity effect on metabolism and fat oxidation²⁷.

1. *Camelina sinensis* L. - (Green Tea)

.The most studied plants due to its wide range of effect including antiobesity various studies have shown its beneficial effects on obesity. A recent study showed that not only the leaf of *C.sinensis* has antiobesity effect, but also the fruit peel, which is considered an agricultural waste. Different antiobesity acting mechanism have been reported *C. sinensis*, including inhibition of pancreatic lipase, appetite, repression activity, adipogenesis, down regulation, thermogenesis, lipid metabolism among others.

2. *Citrus paradise L.-(Grape Fruit)*

Grape fruit was first discovered in the forest of Caribbean island barbados. Although, grape fruit are traditionally used for losing weight. There are only a few studies related to this activity.

Active compound reported for *C.paradisi* including flavonoid and furanocoumarins, B-carotene and d-limonene were reported²⁶.

3. *Citrus lemon L. - (Lemon)*

Lemon plants belong to the Rutaceae family. The crude extract of different parts of lemon (leaves, stem, root and flower) have anticancer and antibacterial property.

One antiobesity mechanism reported for lemon is by regulation of peroxisomes B- oxidation through the increase mRNA level of Acyl-co citrus lemon contain many important phytochemical, including phenolic components and other nutrients²⁴.

4. *Terminalia arjuna- (Arjun)*

Its common name is Arjuna a well-known tree has cholesterol managing properties.

Arjun bark extract exhibit antioxidant activity and protect the body cell and organs from the harmful effect of free radicals. Arjuna enhanced blood circulation and purifies blood too by removing toxin out .it is strong antioxidant as well as which aid to lose weight successfully.

5. Triphala -

(Emblica officinalis, Terminalia belerica and Terminalia chebula)

Triphala (combination of three fruit) purifies and detoxifies total digestive system. Triphala is packed

with vitamin C that boost immunity and provides stamina.

6. *Saraca indica- (Ashoka)*

It is pungent, cold potent and astringent features, which can reduce weight successfully. It also help in blood circulation and improve the functions of digestive system it reduced colic pain, abdominal gas and cramp²⁸.

7. *Syzygium cumini L.-(Jamun)*

It's commonly known as jamun. *Syzygium cumini* regulates the function of liver that aids to digestion. It is packed with vitamin C and antioxidant which further detoxifies body and make you loose weight.

8. *Acacia nilotica L. - (Babul)*

It is commonly called as babool. Acacia helps in liver enhancement and used to heal liver disorders, cancer and hunger suppressant. it improve liver function along with digestion and help to lose extra body fat.

9. *Bacopa monnieri- (Bramhi)*

It is also known as bramhi. .Bramhi act as an anti-anxiety agent and has a calming effect .it discourage the mind habit of over eating and help in losing weight.

10. *Plumbago zeylanica- (Chitrak)*

It is also known as Chitrak. It possess laxative, expectorant, astringent and abortifacient property. chitrakhelo in improving digestion and purifying liver. It also enhance body physiology remove excess body fat²⁵.

Conclusion

Obesity is a significant & public health problem worldwide. Even though, there a several treatments search as surgery & drug, there seems to be no efficient treatment without potential side effect. Improving knowledge of use of anti-obesity medicinal preparation & encouraging obese patients to consume them along with enhance exercise regimen & healthy diet should be continue.

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