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A Review of Ayurvedic Herbal Formulations in the Treatment of Obesity

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Abstract: *Globally, the prevalence of obesity is rising, and it is beginning to surpass infectious diseases and malnutrition as the leading cause of ill health. Particularly, diabetes mellitus, coronary heart disease, some cancers, and respiratory issues are associated with obesity. The components of a decoction from a genuine manuscript included Cinnamomum tamala and Curcuma longa. The goal of this review was to find out how well the herbal brew from the Rasaratna Samuccya treated obesity. Ayurvedic scriptures, modern writings, and previous research investigations (from primary and secondary sources) provided information concerning obesity. Two of the herbs in the chosen decoction were the subject of a review of the literature, which looked at their pharmacological properties and Pancha Padārtha (the five constituents of the plant) in relation to managing obesity. According to an Ayurvedic Pancha Padārtha study, certain herbal formulas have anti-obesity properties because they are compatible with Guna, Shleshma Prakurti, Lēkhana (scraping quality), and Shōshana (absorbing quality). The bulk of research has shown the anti-obesity properties of herbal formula; reviewed articles have also emphasized other attributes that help reduce excess fat in obese people. The Pancha Padārtha analysis and literature evaluation indicate that a certain herbal formula can be beneficial in treating obesity.*

Keywords: Ayurvedic Herbal Formula, Obesity Management, Traditional Medicine

I. INTRODUCTION

Obesity is a disease process marked by an excessive accumulation of body fat and a complex genetic-environmental etiology that has numerous detrimental consequences on various organs. The definition of BMI (Body Mass Index = [Weight (kg)/ Height (m2)]) is a measure of adiposity. Based on the finding that the BMI value associated with the lowest relative mortality is slightly higher in older adults than in younger adults, it is commonly believed that obesity has less of an adverse effect on older adults [1]. The World Health Organization (WHO) defines central obesity as having a waist circumference of more than 88 cm for women and more than 102 cm for men. BMI (kg/m2) is a common way to assess adiposity; a BMI of 25 kg/m2 or more is regarded as overweight. BMI values between 25 and 30 kg/m2 are considered pre-obesity, whereas BMI values greater than 30 kg/m2 are considered obesity. Class I obesity (30 to 35 kg/m2), class II obesity (35.0 to 40 kg/m2), and class III obesity (above 40 kg/m2) are the three classifications of obesity. However, in today's society, the term "overweight" is not frequently used [2].

A number of illnesses, including Prader-Willi syndrome and Cushing's syndrome, are linked to obesity. Although women are frequently accused of having hormonal imbalances, weight gain is typically minimal and the result of water retention. Obesity is associated with both genetic and environmental variables, food consumption, appetite control, energy expenditure, physical activity, and thermogenesis. Because of dietary-induced thermogenesis, thermogenesis is presumably lower in obese and post-obese subjects than in lean subjects [3] [4]. This is one of the most significant global public health issues because of its high incidence and ensuing morbidity and mortality. In 2015, obesity and overweight were linked to 41% of certain malignancies, 7% of ischemic heart disease, and 44% of diabetes mellitus worldwide [5].

Ayurveda states that obesity, or athisthoulya, is caused by an excessive accumulation of fat tissue, or Medō Dhātu, within the body. Different Āchāryās use different terminology to describe the state of "Sthula" or "Sthoulya," and obesity, caused by the reduction in fat tissue metabolism known as Medōdhātavāgnimāndya, is called Medōroga or

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Sthoulya Rōga. Ayurveda discusses obesity in the Vruddhatraya and Laghutraya. The three main canonical works, Charaka Samhitā, Susruta Samhitā, and Ashtānga Hrdaya Samhitā, are instances of Vruddhatraya. According to Charaka Āchāraya, overeating, consuming foods that are heavy, sweet, cooling, and unctuous, not exercising, abstaining from sexual activity, sleeping all day, and hereditary factors are the main causes of obesity [6]. The Susruta Samhitā states that one of the seven diseases that cause poor vitality and mortality are among the Dhātus (tissues) that follow, including fevers, carbuncles, fistulas in abscesses, and Vātika disorders [7]. Āma (undigested food) is the result of Agni, or digestive strength, being out of balance, according to Ashtāngahrdyam. This interferes with the Medō Dhātu's Agni and prevents the formation of new tissue [8].

The Laghutraya comprises Sārangadhara Samhitā, Bhāvaprakāsha, and Mādhava Nidhāna, among other minor classical writings. Mādhava Nindāna defines obesity as the condition in which a person's tummy, buttocks, and breasts begin to move as they exercise because of the accumulation of fat in particular bodily parts [9]. Āchārya Sārangadhara mentioned Sthaulya as a characteristic of the Shleshma Prakruti [10]. More focus was given by Bhāvamishara [11] to risk factors, morbidity, and other behavioral interventions.

Diseases can be treated with Ayurveda and modern medicine, and modern management places a higher priority on lifestyle counseling, weight-loss regimens, prescription drugs, and surgical procedures. Anti-obesity medications are not used for long-term weight maintenance; rather, they are used to optimize the weight loss that low-calorie diets can produce in the short term. Ayurvedic medicine has been utilized to treat obesity by using products that have the qualities of Lēkhaniya and Medōhara (which reduce fat). The Rasaratna Samuccaya, an authentic text stated in Kshudrarōgādi Chikitsithaya, was used to choose the herbs. Ingredients of a decoction taken from a real book are as follows: Thēja Patra (Cinnamomum tamala) and Haridrā (Curcuma longa) and they lower the body's serum cholesterol and extra Mēda (fat) [12].

The current study is based on a Rasaratna Samuccaya-written Ayurvedic medication recipe used to treat obesity. The pharmacological actions of the components in a particular formula in the treatment of obesity were critically examined in this study.

Aims and objectives

The purpose of the study was to ascertain whether the components of a particular herbal formula had any anti-obesity properties for the treatment of obesity.

Research methodology

Ayurvedic classics such Rasaratna Samuccya, Charaka Samhitā, Susruta Samhitā, Ashtāngahrdyam, Mādhava Nidāna, as well as Sāranghadara Samhitā, Bhāvaprakāshaya, and Ayurveda Pharmacopiea were used for the literary review. The review of obesity was carried out using the most recent scientific explanations and discoveries that were published in indexed journals, books, articles, official websites, and encyclopedias. The collected data was compared with both conventional and contemporary scientific explanations using the pharmacological qualities of Veerya (potency), Rasa (taste), Guna (quality), Vipāka (final taste), and Prabhāva (specific action).

Review

Rasaratna Samuccaya Herbal Formula, which was selected from a real book, contains two ingredients: (Reference Table 1).

Cinnamomum tamala (Thēja Patra)

Thējpatra is a little tree that grows to a height of 20 to 30 feet. It is found in moderately climatic regions of South India and Sri Lanka. In bark oil, cinnamonaldehyde (70–85%) is a major ingredient. The main constituents of the volatile oil extracted from Nepalese leaves include linalool (54.55%), cinnamaldehyde (1.45%), limonene, p-cymene, alpha and beta-pinene, and limonene. Monoterpenoides makes up the bulk of the essential oil extracted from the leaves. Seldom are phenylepropanides detected. The components used are oil, bark, and leaf.

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The taste of Cinnamomum tamala is pungent (Katu), bitter (Tikta), and sweet (Madhura). Rasa, Laghu (transparency) Rūksha (arid) Theekshna (aqueous) Pittavardhaka (raise pitta humor) activity, Kapha Vāta Shāmaka (palliative of body humors), Ushna Veerya (hot potency), and Katu Vipāka (pungent final taste) [13].

The primary pharmacological effects are hypoglycemic, antioxidant, and hypolipidemic effects. Leaf ointment is used to cure obesity; the compound tablet is used to treat cough, dyspepsia, and flatulence; it also acts as a diuretic and is good for the spleen and liver. To create drugs with the potential for broad-spectrum biological activity that are chemopreventive, anti-cancer, anti-ulcer, immune-modulatory, anti-lipidemic, anti-diabetic, and hepatoprotective, as well as to promote increased use of Cinnamomum tamala and related species [14] [15] [16].

The aim of the study was to investigate the potential hypolipidemic effect of Cinnamomum tamala leaf extracts in high cholesterol diet-induced hyperlipidemia. For ten days, 400 mg/kg/day of the ethanolic and aqueous extracts of Cinnamomum tamala Nees' leaves were administered. It is successful in managing obesity [17].

The effects of an aqueous extract from Cinnamomum tamala leaf were studied by Jawaida et al. (2014) in rats that had been given an experimentally generated hyperlipidemia. CTLE significantly reduced the TC, TG, and LDL-C while raising the HDL-C in hyperlipidemic rats that were both fed a high-fat diet and exposed to Triton X-100 [18]. Simultaneous treatment of cinnamomum leaf extracts significantly inhibits the rise in serum levels of total cholesterol, triglycerides, LDL cholesterol, VLDL cholesterol, and the atherogenic index, in contrast to significant increases in HDL levels [19] [20] [21].

In this study by Thilawat et al. (2017), 30 hypercholesterolemia patients were treated for three months with 1g twice daily dosages of bark powder from Cinnamomum zeylanicum and Cinnamomum tamala. The lipid profile, clinical improvement, and symptom relief were used to assess the outcomes [22].

Curcuma longa (Haridrā)

Turmeric is a flowering plant in the Zingiberaceae family of gingers; its rhizomes are used in cooking. The plant is native to Southeast Asia and the Indian subcontinent. It is a perennial, rhizomatous herbaceous species. The phytochemical components of the turmeric plant include diaryl heptanoids, a class of chemicals that includes numerous curcuminoids, such as curcumin (3.14%), demethoxycurcumin, and bisdemethoxycurcumin. include turmerone, germacrone, atlantone, and zingiberene, among others. The part used is the rhizome. The actions of Curcuma longa are Thridōsha hara (palliative of three body humors), Laghu Rūksha Guna, Katu Vipāka, Ushna Veerya, and Tikta Katu Rasa [23].

According to Budiman et al. (2015), curcumin and the C. longa L. extract may include compounds with anti-obesity qualities. With inhibitory activities of 70.43% and 66.38%, respectively, at the maximum dose, C. longa L. extract is more effective than curcumin at blocking the synthesis of triglycerides and cholesterol [24] [25].

Turmeric cream is used to cure hemorrhoids. It also has the ability to prevent facial hair growth, inhibit the growth of facial hair, treat diabetes, treat allergic rhinitis, have antioxidant properties, modulate the immune system, detoxify the body, regulate liver function, treat anemia, be beneficial for the eyes, and be used as a calcium supplement.

The anti-angiogenic effect of curcumin polyphenols lowers body fat and weight gain [26]. C. longa also inhibits the early growth response (Egr-1) gene, which is connected to the formation of obesity. It is clear that by modifying leptin, adiponectin, inflammatory mediators, ROS, regulating the nutritional environment, the Egr-1 gene, and the lipogenic gene, C. longa may be helpful in the management of obesity[27]. Curcumin reduces lipogenesis to have anti-hyperlipidemic effects, increases nitric oxide to have anti-hypertensive benefits, and boosts fatty acid absorption to have anti-obesity effects[28]. [29] [30]. Curcumin also reduced cholesterol and phospholipid levels in diabetic rats. The liver had elevated phospholipid, triglyceride, and cholesterol levels when it was diabetic. There was a noticeable tendency for dietary curcumin to undo these changes in the lipid fractions of the liver. The benefits of curcumin were also noted in diabetic rats who were fed a diet rich in cholesterol [31]. In addition to the hypolipidemic impact, Tomar et al. (2012) show that it has antiviral and platelet aggregation-inhibiting properties [32, 33].

II. RESULTS AND DISCUSSION

Different Āchāryās delineate the states of "Sthula" or "Sthoulya," and obesity in different ways. While Samprāpti, or the pathogenesis of obesity, is explained by Ashtānga Samgrāha and Susruta Samhitā, Charaka Samhitā covers the

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basic causes of obesity. Mādava Nidāna, Sārangadhara Samhitā, and Bhāvaprakāsha provide different definitions. current texts discuss current therapies such weight loss diets, surgeries, and pharmaceuticals [4].

According to Ayurvedic Pancha Padārtha study, the formula chosen for Lēkhana and Shōshana Guna possesses anti-obesity qualities. The two plants share Laghu Rūksha Guna in addition to Katu and Tikta Rasa being shared. They are both Katu Vipāka and Ushna Veerya. Many Āchārya Lēkhana Guna say that Katu Tikta Rasa's Lēkhana Guna scrubs the body of excess Kapha and Mēdha. Shōshana Guna, which takes in excess fat and water. Based on research of Guna, two Gunās that stand out the most are Laghu and Rūksha. These Gunās contribute to the decrease of Mēda and Kapha in obesity. Ushna is the most famous Veerya, and Ushna Veerya contributes to the decrease in obesity, according Veerya study. According to Vipāka study, Katu Vipāka is the most noticeable, and after the obstruction is removed in accordance with Dōsha Karma, blood flow returns to normal. Tridōshahara, Kaphahara, and Vātahara Karma are beneficial in the management of obesity. Therefore, the study conducted by Pancha Padārtha indicates that the decoction that was picked is effective in managing obesity.

Reviewed literature indicates that certain decoctions of herbs have the potential to be naturally bioactive compounds with a variety of pharmacological effects. Furthermore elucidated, they display wide array of modes of action and influence the physiological and biochemical regulation of cells. Both of the plants in the chosen decoction are hypolipidemic and anti-obesogenic, according to the literature review. Additionally, several decoctions exhibit anti-diabetic properties, which in turn help to reduce extra fat because obesity and overweight are linked to diabetes mellitus. Another theory is that the anti-oxidant activity of these particular decoctions lowers obesity because their strong anti-oxidant qualities both directly and indirectly cause hypolipidemic effects.

Treatment of obesity through modifications to the Egr-1 gene, lipogenic gene, inflammatory mediators, ROS, adiponectin, leptin, and nutritional environment [29]. Curcumin possesses anti-hyperlipidemic, anti-obesity, and antihypertensive qualities by enhancing the absorption of fatty acids and reducing lipogenesis. anti-angiogenic activity, control of liver function, management of anemia, and anti-atherosclerotic properties with anti-diabetic properties [28].

Pharmacies are stocking an increasing number of carefully chosen herbal products that are recommended for the prevention of obesity. However, more comprehensive and rigorous human study is needed to discover whether these particular concoctions may be used to treat and prevent obesity in humans. They display characteristics that are both cytotoxic and cytoprotective. Therefore, specific decoction is effective in treating obesity.

III. CONCLUSION

Over the past few decades, obesity has been discussed globally as a significant public health issue. Based on the examination of clinical features, three types of obesity can be identified: Atisthaulya (severe morbid obesity), Madyasthaulya (obesity classes 1 and 2), and Heenasthaulya (overweight). Literature research and Pancha Padārtha evaluation suggest that Curcuma longa and Cinnamomum tamala are helpful in reducing obesity. According to earlier research on pharmacological effects, the herbs in the chosen herbal mixture offer potent anti-obesity properties. Globally, there is an urgent need to lower the prevalence of overweight and obesity.

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