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A Systematic Review on The Commonly Available Plants With Anti-Obesity Potential

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Abstract :
The development of obesity involves hormones and neurotransmitters. The Body Mass Index (BMI) help us to determine the levels of obesity. The prevalence of obesity, measured by BMI has raised to unacceptable levels both men and women worldwide with resultant hazardous health implications. Genetic, environmental, and behavioural factors influence the development of obesity. Obesity is associated with and contributes to a shortened life span, type 2 diabetes mellitus, cardiovascular disease. some cancers, kidney disease, obstructive sleep apnea, gout, osteoarthritis, and hepatobiliary disease, among others. Since an intriguing relationship between thyroid and obesity had seen. Thyroid hormones are involved in multiple physiological processes and regulating basal metabolic rate, promote the adrenergic nervous system to generate heat in response to cold exposure, stimulate gluconeogenesis and both lipolysis and lipogenesis. These characteristics of thyroid hormone gives a way to alter the metabolic activity as required by the individuals.Essential components for the production of TH is to intake of selenium and zinc rich foods. . The increase in production of TH will increase the Basal Metabolic Rate in the body.Thus the increase in BMR leads to the reduction and breakdown of LDL-cholesterol, total cholesterol and triglycerides which causes fat storage. The reduction in the fat level will eventually leads to lower the risk of obese. This paper is an attempt to describe the research work that has been carried out on the usage of some of the plants on the control of obesity.
KEYWORDS: Obesity ,Basal Metabolic Rate(BMR), Thyroid Hormones(TH), Selinium and Zinc rich foods.

I. INTRODUCTION

Obesity is defined as a condition of abnormal or excessive fat accumulation in adipose tissue, to the extent that health is impaired. The amount of excess fat in absolute terms, and its distribution in the body - either around the waist and trunk or peripherally around the body In general, obesity is associated with a greater risk of disability or premature death due to type 2 diabetes mellitus (T2DM) and cardiovascular diseases (CVD) such as hypertension, stroke and coronary heart disease as well as gall bladder disease, certain cancers (endometrial, breast, prostate, colon) and non-fatal conditions including gout, respiratory conditions, gastro-oesophageal reflux disease, osteoarthritis and infertility.

Obesity also carries serious implications for psychosocial health, mainly due to societal prejudice against fatness.

Thyroid hormones are involved in multiple physiological processes and regulating basal metabolic rate, promote the adrenergic nervous system to generate heat in response to cold exposure, stimulate gluconeogenesis and both lipolysis and lipogenesis. Patients with thyroid dysfunction may experience changes in body weight and body composition.

Hypothyroidism induces a decreased basal metabolism and thermogenesis, an accumulation of hyaluronic acid and a decreased renal flow, all factors leading to water retention. Severe hypothyroidism states lead to a clinical picture known as myxoedema in which hyperkeratosis of the skin and facial edema could give the patient a false appearance of overweight. Patients with hypothyroidism have also slow peristalsis causing chronic constipation that may result in weight gain. This weight gain is mainly due to water retention and is not related to an increase in fat mass. In addition, some studies have found a higher prevalence of subclinical hypothyroidism among obese patients. Since hypothyroidism and obesity are often linked at least consciousness in public.

Conversely, hyperthyroidism has traditionally been associated with weight loss and underweight. Subjects with hyperthyroidism have an adrenergic hyperstimulation with increased basal metabolism and

thermogenesis, and a greater overall energy expenditure resulting in a tendency toward weight loss. Hyperthyroidism can also induce an increased gastrointestinal transit and occasionally anorexia due to the anorexigenic effect of triiodothyronine

Thyroid Hormone plays a significant role in energy expenditure through both central and peripheral actions. Thyroid Hormone maintains basal metabolic rate, facilitates adaptive thermogenesis, modulates appetite and food intake, and regulates body weight.

BASAL METABOLIC RATE

Basal metabolic rate (BMR) is the primary source of energy expenditure in humans, and reductions in BMR can result in obesity and weight gain . TH is a key regulator of BMR, but the targets are not clearly established. BMR correlates with lean body mass and thyroid hormone levels.. In addition, Resting Energy Expenditure (REE) is remarkably sensitive to Thyroid hormone.TH stimulates BMR by increasing ATP production for metabolic processes and by generating and maintaining ion gradients. TH stimulates metabolic cycles involving fat, glucose, and protein catabolism and anabolism. The two ion gradients that TH stimulates, either directly or indirectly, are the Na^+/K^+ gradient across the cell membrane and the Ca^{2+} gradient between the cytoplasm and sarcoplasmic reticulum. TH can alter the levels of Na^+ within the cell and K^+ outside of the cell, thus requiring ATP consumption in the form of Na^+-K^+-ATPase to maintain the gradient. In addition, TH directly stimulates the Na^+-K^+-ATPase, but this effect has more impact on BMR in hyperthyroidism than in hypothyroid individual. TH also regulates the expression of the sarcoplasmic/endoplasmic reticulum Ca^{2+}-dependent ATPase (SERCA) in skeletal muscle. Stimulation of the Ca^{2+}-ATPase produces heat during ATP hydrolysis.TH maintains BMR by uncoupling oxidative phosphorylation in the mitochondria or reducing the activity of shuttle molecules that transfer reducing equivalents into the mitochondria. In skeletal muscle, TH increases the leak of protons through the mitochondrial inner membrane, stimulating more oxidation to maintain ATP synthesis, since the proton-motive force driving ATP production is compromised. .In hyperthyroidism, there is an increase in both ATP synthesis and heat production.

SELENIUM :

Selenium is an essential trace mineral for humans, meaning we should all be getting enough from our diets every day through the consumption of selenium foods.It has both antioxidant and anti-inflammatory effects, especially because it's required for the creation of Glutathione, considered our body's master antioxidant.For this reason, research suggests that consuming foods high in selenium can support detoxification and liver function, as well as hormonal and thyroid health.

Improved Thyroid Health — Selenium plays a role in maintaining thyroid health since it works together with iodine. In fact, the thyroid is the organ in our bodies with the largest content of selenium. It's needed to produce a critical thyroid hormone called T3, which regulates metabolism. Selenium deficiency is known to lower the synthesis of thyroid hormones.

The US Recommended Dietary Allowance (RDA)shows the daily intake of selinium

Age	Recommended daily amount of selenium
Over 14 years	55 mcg
9 to 13 years	40 mcg
4 to 8 years	30 mcg
7 months to 3 years	20 mcg
Birth to 6 months	15 mcg

Women who are pregnant or lactating need up to 60 mcg of selenium per day.

SELENIUM RICH FOODS

1. **Brazil nuts**: Brazil nuts are one of the best sources of selenium. One ounce, or about six to eight nuts, contains about 544 mcg. One should Make sure that he eat a serving of brazil nuts a few times a week to avoid selenium toxicity.
2. **Fish**: Yellowfin tuna contains about 92 mcg of selenium per 3 ounces (oz), making it an excellent source of selenium. This is followed by sardines, oysters, clams, halibut, shrimp, salmon, and crab, which contain amounts between 40 and 65 mcg.

3. **Pork** : Three ounces of lean pork contain about 33 mcg of selenium.
4. **Beef** : The selenium content of beef depends on the cut, but a bottom round beef steak will provide with about 33 mcg. Beef liver provides about 28 mcg, and ground beef offers about 18 mcg.
5. Chicken: Chicken will give about 22 to 25 mcg of selenium per 3 oz of white meat. This translates to a serving that's similar in size to a deck of cards, making it an easy way to add some selenium to r diet.
6. Cottage cheese: One cup of cottage cheese provides about 20 mcg, or 30 percent of r daily recommended intake of selenium.
7. Egg: One hard-boiled egg provides about 20 mcg of selenium. Don't like hard-boiled? No worries, go for eggs cooked any way like, and 'll still get a dose of selenium.
8. Brown rice: One cup of cooked long-grain brown rice will provide with 19 mcg of selenium, or 27 percent of the recommended daily amount. Rice can be also get substitute for barley which provides 23mcg per 1/3 cup serving.
9. Mushroom: Mushrooms are fungi that contain many nutrients, including vitamin D, iron, and about 12 mcg of selenium in a 100-gram serving
10. Spinach: Spinach cooked from frozen, will provide with about 11 mcg of selenium per cup. It's also packed full of folic acid and vitamin C.
11. Milk and yogurt: Milk and yogurt each contain about 8 mcg of selenium per cup, or 11 percent of r needs per day.
12. Lentils: One cup of cooked lentils provides about 6 mcg of selenium, plus a healthy dose of protein and fiber. Add them to a soup with mushrooms for a vegan-friendly meal full of selenium.
13. Bananas: One cup of chopped banana offers 2 mcg of selenium, or 3 percent of r daily recommended intake. Again, this might not seem like much, but most fruits offer only minimal traces of selenium or none at all.

ZINC

Zinc is a type of metal and an essential trace element. It's "essential" because must obtain it from r diet, since our body can't make its own. It acts like an antioxidant within the body, fighting free-radical damage and helping slow the aging process. This mineral also has a major impact on hormonal balance, so for this reason, even a small deficiency can result in an increased risk for infertility or diabetes.

Zinc rich foods

Lamb (3 ounces): 2.9 milligrams (35 percent DV)
Chickpeas(1 cup cooked): 2.5 milligrams (31 percent DV)
Cashews(¼ cup) : 1.9 milligrams (23 percent DV)
Pumpkin seeds (¼ cup): 1.6 milligrams (20 percent DV)
Yogurt (or Kefir)(6 ounces): 1 milligrams (12.5 percent DV)
Chicken(3 ounces): 1 milligrams (12.5 percent DV)
Turkey(3 ounces): 1 milligrams (12.5 percent DV)
Eggs (1 large): 0.6 milligrams (7 percent DV)
Mushrooms(1 cup): 0.6 milligrams (7 percent DV)
Salmon(3 ounces): 0.5 milligrams (6 percent DV)

II. DISCUSSION:

The above study is an attempt to understandhow thyroid hormone influence the basal metabolic rate which try to reduce the risk of obese by consuming of selenium and zinc rich foods.

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