“ROLE OF PEARL MILLET IN DIET FOR MANAGEMENT OF STHOULYA (OBESITY) AYURVEDIC VIEW.”

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ABSTRACT:
Sthoulya (obesity) has become a troublesome condition and cause of many lifestyle diseases. Treatment strategies for obesity and its prevention mainly depends on improvements in lifestyle and dietary control. Dietary interventions play important role in obesity. Daily intake of millet-based foods is found to be useful in obesity. Mainly used grain is Pearl millet. Though its intake is confined to lower income segments of society, it is highly nutritious grain. It provides better source of calories, protein, vitamins, and minerals than other large cereals. Pearl millet can be used to prepare a variety of delecious food products useful in obesity. Therefore, the current review addresses the role of Pearl millet in managing obesity.

KEYWORDS: Sthoulya (obesity), Pearl millet, lifestyle, Diet.

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INTRODUCTION:
Obesity in Ayurved is described as Sthoulya Roga, Medoroga, Santarpana Janya Vyadhi, Dhatvagni Mandhyajanya Vyadhi etc. Acharya Charaka has described Sthoulya among the ‘Ashtaninditiya Purusha’.[1] Obesity is one of the major causes of Hypertension, Diabtes mellitus, Osteoarthritis, infertility, Stress, depression etc. Acharya Sushruth also told that Madhyam sharira is the best.[2] Atisthula and Atikrisha are always affected with some complaints.[3] The sedentary lifestyles, stress and dietary habits are primary predisposing factors for Sthoulya. Consuming high fatty food, fried items, etc., along with sedentary life-style leads to excess accumulation of body fat which gets deposited in the numerous body channels. It is observed that when the food is right, there's no need for medicine and when the food is wrong, no medicine works. Diary treatments are a simple and economical way to deliver preventive benefits and enhance quality of life. So, looking upon the importance of this disorder an attempt is made to review the role of commonly used Pearl millet in the diet for management of Sthoulya (obesity).

Sthoulya (Obesity): The meda and mansa dhatu gets vitiated and gets lodged in nitamba, stana and udara region. Therefore, these body parts move during any activity done by person. Improper growth nitamba, stana and udara is seen and the paient remains lethargic. This condition is said to be sthoulya. The nidana (factors) which lead to obesity are Atisampuranada (unhealthy food), Guru, madhur, atisnigdha dravya (to eat fatty foods), Avyayam (lack of exercise), Avvyaya (lack of coitus), Diwaswapa (sleep during daytime), Harshanitya (to remain happy carelessly). Beeja swabhavat (hereditary obesity, when the obesity comes through maternal or patrenal genes).
Samprapti Ghatak of Sthoulya
Dosha - Kapha- Kledaka, Pitta -Pachaka, Vata- Samana
Dushya- Rasa, Meda
Agni - Jatharagni, Medodhatvagni
Srotas- Medovaha
Udbhava- Amashaya
Prasara- Sarva Deha
Adhishtana- Vrukka and Vapavahana
Vyakta Sthana- Sarvanga specially Sphik, Sthana, Udara, Gala
Roga Marga - Bahya and Abhyantara
Vyadhi Prakara - Chirakari
Sadhyya Asadhyata- Kruchrasadhya.[4]

Sthaulya is included under eight undesirable conditions (Ashtau Nindita), Shleshma Nanatmaja, Samtarpana Nimittaja, Atinindita, Ati Brihmana Nimittaja and Bahu Dosha Janita [5] Vikara. The patient of Sthaulya exhibits very strange phenomenon. Their appetite is excessive and whatever they eat is quickly digested, which indicates hyperfunctioning of the Jatharaagni. Besides this, the patient suffers from laziness, may be due to under supply of energy, which may be due to hypofunctioning of Bhutaagni. Dhatvaagni also seems to be disturbed, as in Sthaulya patient mainly Medo-Dhatu is formed and there is deficiency of another Dhatu.[6] It is a santarpana janya roga and it results due to derangement in metabolism thereby only meda dhatu increases and restricts the formation of other dhatus. [7] Pruthvi and Jala mahabhoota are associated with the heavy, dense, slow, and cold qualities and are antagonistic to strong metabolic fire, which is sharp, light, and hot, thus contributing to slow metabolism and obesity.[8] Symptoms of Sthoulya are Increased hunger(Atikshudha), Increased thirst (Atipipasa), Perspiration(Atisweda), Breathlessness(Atiswasa),Sleepiness(Atinidra), Difficulty to perform heavy work (Aayas Ashamata), Sluggishness(Jadata), Short lifespan(Alpaayu), Decreased body strength (Alpabala), Bad body odour (Dougandhya),
Unclear voice (Gadgada) In context of body. [9] Acharya Charakahas mentioned eight Dosha of Sthoola Purush. Aayu Shaya (decreased life expectancy), Java Uprodha (laziness), Kricha Vyavaya (difficulty in sex), Dourbalya (weakness), Dourgandhya (smelly body), Sveda Abadha (perspiration), Ati Shudha (increased appetite), Ati Pipasa (increased thirst) [10] In modern view Sthoulya is correlated with obesity. Obesity may be defined as an abnormal growth of the adipose tissue due to an enlargement of fat cell size or an increase in fat cell number or a combination of both. The measurement of obesity is done by Body Mass Index (BMI). BMI = Weight is calculated in kilograms / height in meters square.

BMI 18.5 – 24.9 = Normal weight, BMI 25.0 – 29.9 = Overweight, BMI 30.0 – 34.9 = obesity Class 1, BMI 35.0 – 39.9 = Obesity Class 2, BMI >_40 Obesity Class 3.

**Gun karma of Pearl Millet (Bajari)**

Pearl millet (Pennisetum glaucum) is a multifunctional cereal crop which belongs to the Poaceae family. It is generally referred to in various local Indian languages as bajra, bajri, sajje, kambu, kamban, sajjalu, etc. It is widely used for food and forages [11]. Pearl millet has many nutritional benefits as a result of its rich structure of minerals and proteins. It has high protein content, and it comprises several significant minerals such as magnesium, phosphorus, zinc, etc. It also provides vital amino acids and vitamins that add to a variety of human treatments [12]. Pearl millet is widely recommended for people with elevated cholesterol levels. It comprises a phytochemical known as phytic acid that is estimated to influence the metabolism of cholesterol and balance the cholesterol in the body [13]. It has gained importance in diet, as it is economical, nutritional and also gluten free. Naliis said to possess Madhura rasa (Sweet in taste), is Ruksha (Dry) and Laghu (Light), Ushna veerya (Hot in potency, Catabolic in nature), Katu Vinaka (Post digestive Pungentness) and is said to vitiate Vata and Pittaas per Madanapala nighantu [14]and Priya nighantu [15]. It also acts as Shleshmahara (Pacifics Kapha dosha). The other properties and actions ascribed to Nali are Balya (Strength promoting), Durjara (Difficult for digestion) Pumstvahara (Antaphrodisiac), Vilekhan (Scarring), Baddhanisyanda (Dries up and accumulates the fluid tissues of the body) [16]. Nighantu rathnakara opines differently from the above authors. Nalika has Katu and Tikta rasa (pungent and bitter in taste), along with Madhura. The potency of Bajrais said to be Sheetoshna and it possesses Teekshna guna. Bajra pacifies Vata and Pitta according to Nighantu rathnakara [16] which is the contrary of the view mentioned in Priya nighantu [6]. The diseases which are said to be alleviated by Bajraare Raktapitta (Bleeding disorders), krumi (Worm infestation), Visha (Poisoning), Shula (GI ulcers), Ashmari (Calculi), Mutrakrucchra (Dysuria), Raktadosha (haematological disturbances), Trusha (Dyspepsia), Kandu (Puritis), Jvara (Fever), Vrana (Wounds and ulcers) and Durnama (Haemorrhoids). [16]

**DISCUSSION:**

Treatment protocols of Sthoulya include Guru Aptarpana Aahar, Ruksha-Ushna-Tikshan-Chedaniya Aushad, purifactory measures like Vaman, Virechan, Rakta Mokshana and incorporating physical and mental activities in daily schedule of an obese person. The gun karma of pearl millet is opposite of the dosh and dushyas involved in Sthoulya. Medo-hara, Kapha-hara actions of the pearl millet are useful in Sthoulya. Ruksha (Dry), Laghu (Light), Ushna veerya (Hot in potency, Catabolic in nature), Katu vipaka (Post digestive Pungentness) act effectively on kapha dosh meda dhatu. The
greatest obstacle facing people who wish to lose weight is to regulate their consumption of calories. Pearl millet will support the weight loss process because its fibre content is high. It takes longer for the grain to travel from the stomach to the intestines, due to the fibre content. This means the pearl millet satiates hunger for a long time and therefore helps to limit the total intake of food [17]. Pearl millet is safe to use in the diets of babies, lactating women, the elderly, and the convalescent.[18] Therefore it can be used in diet for obesity of babies, lactating women, the elderly, and the convalescent.

Obesity is an inflammatory disorder, Inflammation results in free radical production. Antioxidants from foods play a crucial role in scavenging the free radicals and reducing inflammation [19] It Is Durjara (Difficult for digestion), The fiber content in Pearl Millet provides a feeling of fullness, aiding in weight management by reducing overeating and snacking. Its high fiber content not only promotes satiety but also regulates blood sugar levels. This helps prevent sudden spikes and crashes in energy, reducing cravings for unhealthy snacks and therefore very useful in obesity. It is Balya (Strength promoting) so useful to overcome AayasAshawama (Difficulty to perform heavy work), Sluggishness (Jadata), Decreased body strength (Alpabala). It is Tikshna, lekhaniya so useful to reduce excess fat.

CONCLUSION:
A variety of bioactive compounds present in pearl millet possess numerous health benefits such as antimicrobial, antioxidant, antidiabetic, and hypcholesterolemic effects, as well as hypoglycaemic activity and guarding against diet-related diseases. Lifestyle modification is the key to sustainable weight loss. Healthy eating is one of the lifestyle modifications for weight loss. Thus, one of the multimodal integrated interventions for management of obesity is to include Pearl millet in a regular diet.

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