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A STUDY ON THE EFFECT OF SHATKARMA ON BODY WEIGHT IN THE PATIENTS OF DIABETES MELLITUS

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ABSTRACT
India leads the world today with the largest number of diabetics in any given country. In the 1970s, the prevalence of diabetes among urban Indians was reported to be 2.1%, and this has now risen to 12.1%. According to the World Health Organization (WHO) projections, the present 30 million to 33 million diabetics in India will go up to 74 million by 2025. The WHO has issued a warning that India will be the "Diabetes Capital of The World" (Bacic, et al., 1988). Obesity is very common in T2DM (80% or more are obese) (Longe *et al.*, 2012). Present study is aimed at finding out the effects of practice of Shatkarma (Laghu Shankh Prakshalan and Agnisar), a highly reputed Yogic exercise on body weight in the patients of diabetes mellitus. The result revealed that post-experiment body weight was higher than that of pre-experiment.

KEYWORDS: Agnisar, bodyweight, Diabetes Mellitus, Laghu Shankh Prakshalan, Shatkarma, T2DM.

INTRODUCTION

Hyperinsulinemia and insulin resistance are pervasive features of obesity, increasing with weight gain and diminishing with weight loss. Insulin resistance is strongly linked to intra-abdominal fat than to fat in other depots. Molecular link between obesity and insulin resistance in fat, muscle, and liver have been sought for many years. Major factors include: 1) insulin itself, by inducing receptor down regulation; 2) free fatty acids that are increased and capable of impairing insulin action; 3) intracellular lipid accumulation and 4) several circulating peptides produced by adipocytes, including cytokines. Obesity, however, is a major risk factor for diabetes, and as many as 80% pf patients with type 2 diabetes mellitus are obese. Weight loss and exercise, even of modest degree, increase insulin sensitivity and often improve glucose control in diabetes (Longo et al., 2012). Effective weight management is particularly important for patients with diabetes because it improves the body's ability to regulate glucose, and thereby reduces the need for medication (Straub, 2007).

Some studies in the context of yoga and weight have reported that yogic practices are beneficial in reducing obesity. Ideal body weight (IBW) was initially introduced by Devine in 1974 to allow estimation of drug clearances in obese patients; researchers have since shown that the metabolism of certain drugs relate more to IBW than total body weight (Pai *et al.*, 2000). Gabriela *et al.* (2007) revealed that Body mass index, waist circumference, and waist/hip ratio have been shown to be associated with type2 diabetes. From the clinical perspective, central obesity (approximated by waist circumference or waist/hip ratio) is known to generate diabetogenic substances and should therefore be more informative than general obesity (body mass index). Kristal (2005) reported that regular yoga practice can benefit the individual who wishes to maintain or lose weight. While Kiran *et al.* (2000) reported that Agnisar Kriya is very significant for weight reduction; Liebers (1960) reported that specific as an as are useful for the same. Rioux (2013) on the contrary, opined that research on the effectiveness of yoga as a treatment for obesity is limited, and studies vary in overall quality and methodological rigor.

MATERIALS AND METHODS

Twenty patients of diabetes mellitus were selected from Ballia district. After selecting 20 subjects on the basis of accidental sampling, they were made to practice Shatkarma for a span of 60 days. Shatkarma included Laghu Shankha Prakshalana (Gherand Samhita Chapter1, Versus 17) once a week and Agnisar (Gherand Samhita, Chapter1, Versus 19), 15-30 rounds daily. Body weight of each subject was tested before starting the experiment, i.e. Day 1, middle of the practices i.e. Day 30 and on completion i.e. Day 60.

RESULTS

The mean body weights in the patients of diabetes mellitus were found to be 67.95(+7.34) kg, 64.05 (+7.12) kg and 60.3(+6.67) kg on day 1, day 30 and day 60respectively (Table 1). It is obvious that the mean value is lower on day 30 than that on day 1, and further lower on day 60 than that on day 1 and day 30. While the values of day 1 and day 30 as well as those of day 30 and day 60 did not vary significant level, those of day 1 and day 60 varied at 0.01significance level. Thus, it is again obvious that higher the duration, higher is the improvement in body weight.

Table 1 Body weight of diabetes patients (Mean Value)

Days	Mean body weight(Kg)	S.D	t- value	Level of significance
Day 1	67.95	7.34	1.74*	non-significant
Day 30	64.05	7.12	1.75**	non-significant
Day 60	60.3	6.77	3.51***	0.01

*t-value of day 1 & day 30, ** t-value of day 30 & day 60, *** t-value of day 1 & day 60

DISCUSSION

The gastrointestinal tract requires to be rotated in order to be washed thoroughly justas conch shell. In *Laghu Shankha Prakshalana* this is achieved by performing particular exercises which increase intestinal motility temporarily, thus causing the large volume of water gulped to move down the intestines and resulting into watery loose motions (Malshe, 2005).The first asana of *Laghu Shankha Prakshalana, Tadasana* opens the pyloric sphincter muscle of stomach through the expansion of oesophagus, stomach and duodenum. Then water enters into small intestine (Gherand Samhita, Chapter1, and Versus 17).The second asana of *Laghu Shankha Prakshalana, Tiryaka Tadasana* contracts in one side and relaxes in other side of the intestinal layers repeatedly. This causes water to enter from first layer to second layer and from second layer to third layer of intestine with pressure immediately (Gherand Samhita, Chapter1, Versus 17). That eliminates theover dated and dried foodstuffs from intestines which remain clinged to rugue of stomach and villies of intestines for long time period.

The third asana of *Laghu Shankha Prakshalana, Katichakrasana* twists thewhole smooth muscles of stomach and intestine. Due to twisting, water and pressurework together and push the foodstuffs along with water downwards (GherandSamhita, Chapter1, Versus 17**)**.

The fourth asana of *Laghu Shankha Prakshalana, Tiryaka Bhujangasana* opens the ileocecal sphincter muscle which lies between small intestine and large intestine, by twisting the small intestine as well as large intestine. At that moment water enters into the large intestine (Gherand Samhita, Chapter1, Versus 17**).**

The fifth asana of *Laghu Shankha Prakshalana, Udarakarshan* provides the massages and generates the stretching in digestive organs, nerves and muscles. Hence repeated contraction and relaxation occurs in Gastrointestinal Tract (Gherand Samhita, Chapter1, Versus 17**).**

Finally, complete bowel evacuation and elimination of the whole waste materials from Gastrointestinal Tract occurs. This local cleansing and purification of the digestive tract improves the digestive process and strengthens our whole body.

Laghu Shankha Prakshalana also reduces the bile acid pool. Bile is a complex fluid containing various substances, some of which are merely waste products undergoing excretion (Chatarzee, 2002). Cholesterol, one of the chief constituents of bile, is also reduced; resulting in reduced fat (both triglyceride and cholesterol) absorption for the next several days (Malshe, 2005) and thus it can help to reduce weight.

With regular practice of *Agnisar* the effects become visibly apparent. Vitality increases as *Agnisar* has a powerful toning effect on the visceral organs, muscles, nerves and glands. *Agnisar* increases blood flow to the entire abdominal cavity including pancreas and pressure decreases by 80 mm of Hg in the intestine. Due to this the autonomic nerves comprising the solar plexus are strengthened. The process of digestion, assimilation and elimination are directly affected (Muktibodhanand, 2009), thus regulating the hunger and thirst. Improper functioning in the alimentary canal is one of the most basic causes of overweight. *Agnisar* effects optimal functioning of this region, thereby overcoming many related diseases. As a result, *Agnisar* lowers the body weight.

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