WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.453
Volume 14, Issue 5, 1007-1013. Research Article ISSN 2277–7105

THERAPEUTIC EFFECTS OF *SHIGRU TAKRA PANA* AND *TAKRA BASTI* ON ANTHROPOMETRIC, BIOCHEMICAL PARAMETERS, AND GUT MICROBIOTA IN OBESE INDIVIDUALS

Dr. Varshanath B.[1] and Dr. Harikrishnan G.[2*]

[1]Ayurveda Chief Physician, Kottakkal Arya Vaidya Sala Outlet, Kureepuzha PO, Kollam, Kerala – 691601, India.

[2*]Assistant Professor, Department of Rasashastra & Bhaishajya Kalpana, SCPM Ayurvedic Medical College, Lucknow Road, Haripur, Gonda, Uttar Pradesh – 271003, India.

Article Received on
10 January 2025,

Revised on 31 Jan. 2025,
Accepted on 21 Feb. 2025

DOI: 10.20959/wjpr20255-35761

***Corresponding Author**
Dr. Harikrishnan G.
Assistant Professor, Department of Rasashastra & Bhaishajya Kalpana, SCPM Ayurvedic Medical College, Lucknow Road, Haripur, Gonda, Uttar Pradesh – 271003, India.

ABSTRACT

Obesity is a serious social and psychological condition that affects regardless of age or socioeconomic status. Apart from the physiological and biochemical pathologies proposed, a change in the gut microbiota has been found to be a significant contributor in the regulation of body weight. In Ayurveda, *sthoulya* is mentioned under *Asthanini*dita and *Bahudoshavastha* condition. The role of diet and treatment are equally or even more important in obesity to control as well as to prevent complications. *Takra* (buttermilk), a fermented milk product that is "ready to serve," drink has a wide range of potential benefits for both nutrition and health. To enhance the nutrient delivery system, it was made an effort to combine *takra* and *shigru*, where Acharya Vagbhata has emphasized *takra* as *anupana* to *shigru. Takra* is suggested in classics as a probiotic and a regulator of the microbiome in the human gut. Obese people have a different gut microbial composition than lean people. With this background, administering *takra* via rectal route in sufficient doses can also alter gut flora, which has positive effects on health. People exhibiting adiposity and dyslipidaemia have been found to have less bacterial diversity and also manifest drastic changes in their physiological and anatomical parameters. Considering the probiotic potential, the *shigru takra pana* along with *takra basthi* has a potential therapeutic target on anthropometric and biochemical parameters along with the gut microbiota composition in obese individuals.

KEYWORDS: *Takra, shigru, takra basthi*, gut microbiota, obesity.

INTRODUCTION

The National Institute of Health have identified obesity as a research priority due to the rising population. According to CDC, there are approximately 93.3 million obese Americans in 2015-2016, with a prevalence rate of 39.8%. Numerous disorders such as type 2 diabetes mellitus, hypertension, cardiovascular disease, dyslipidaemia, stroke, liver disease is mostly caused by obesity. In addition to nutritional, lifestyle and genetic factors, it has been suggested that obesity may also result from perturbation of the gut microbiome. Approximately $10^{[14]}$ bacteria and archaea of more than 1000 species exist in the human gastrointestinal tract; together these are known as the gut microbiota. A reciprocated relationship exists between the gut flora and diet, whereby dietary factors regulate the role of structure of microbiota. In contrast, a healthy balance of intestinal microbiota may play a role in preventing of alleviating obesity and metabolic diseases. Inter and multidisciplinary care have been shown to reduce weight and body mass index (BMI). Ayurvedic medicine for treating obesity has not been rigorously studied in clinical trials. This practice of ayurvedic medicine entails the application of individualized multitarget therapies and holds potential for the effective treatment of obesity. The role of diet and treatment are equally or even more important in obesity to control as well as to prevent complications. In *Bhavaprakasha*, *takra* is considered as nectar on earth. The person who takes *takra* daily, never becomes ill and diseases which are cured by *takra pana* never happened again. So, according to Acharya Vagbhata, takra is considered as *anupana* to *shigru* to increase the bio accessibility and bioavailability of micronutrients. Also, buttermilk is recommended in Ayurveda as a probiotic and a modulator of the human gut microbiome. Administering *takra* via rectal route in sufficient doses can also alter gut flora, which has positive effects on health. People exhibiting adiposity and dyslipidaemia have been found to have less bacterial diversity and also manifest drastic changes in their physiological and anatomical parameters. Considering the probiotic potential, the *shigru takra pana* along with *takra basthi* has a potential therapeutic target on anthropometric and biochemical parameters along with the gut microbiota composition in obese individuals.

MATERIALS AND METHODS

Without limiting the publishing era, the study was conducted utilising the databases from PubMed, Springer, Scopus, and Google Scholar.

Articles suggesting various gut flora and its composition were included as the first objective to analyse the association between the gut microbiome and obesity. The second goal is to discuss how the therapeutic effects of *shigru takra pana* and *takra basthi* affect anthropometric and biochemical markers as well as the composition of the gut microbiota in obese people.

RESULTS

Manufacture of *shigru takra pana*

Buttermilk, a "ready-to-serve" fermented milk product, is used as a refreshing beverage from time immemorial in India. An attempt was made to develop a buttermilk containing Moringa leaf powder (MLP) to improve its nutritional value. Buttermilk was prepared from dahi (curd) containing 4.5% milk fat and 8.5% MSNF. A Mesophilic/Thermophilic culture was used for preparing dahi. The most acceptable level of total milk solids (TMS) in buttermilk, acidity of dahi and MLP in buttermilk were optimized using Response Surface Methodology with central composite rotatable design. It was found that 5.31% TMS, 0.91% acidity of dahi and 0.62% MLP gave the most acceptable product. A blend of 0.08% pectin and 0.03% carrageenan was selected and addition of salt, sugar and spices @ 0.5%, 4.0%, 0.5% respectively were most suitable. The proximate chemical composition of Moringa buttermilk was 11.33% total solids, 1.58% protein, 1.8% fat and 0.83% ash. One serving size (300 g) of the product could be "a good source of Vitamin A, calcium and iron" providing 10, 18 and 11% DV respectively. The shelf-life of the product was 20 days when packaged in Polyethylene terephthalate (PET) bottles and stored under refrigeration (7±2 °C).[1]

Rectal administration of buttermilk processed with medicinal plants

A course of 15 enemas over 15 days (1 enema daily). Of these 3 enemas (1,8,15) were of sesame oil, which were administered after food in a quantity of 120 ml. the remaining enemas were of buttermilk processed with a mixture of 8 herbal drugs, namely Acorus calamus, Piper longum, Cyperus rotundus, Aegle marmelos, Anethum sova, Randia spinosa, Trachypse rmumammi ans, Saussera lappa. In short, 320ml of curd was churned and 80 ml of water was added to it. The plant, as mentioned above, were added to the buttermilk in a quantity of 10g each. This processed buttermilk was administered to the subjects on an empty stomach.[2]

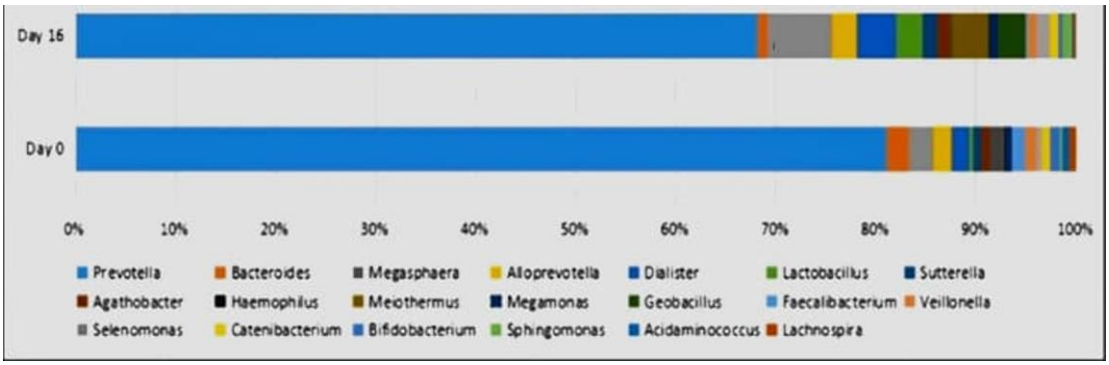
Composition and vitals on day 0 and day 16.[2]

Parameters		Day 0	Day 16
Anthropometry	• Weight (kg)	85.4	84.72
	• BMI (kg/m2)	33.6	33.38
	• Abdomen circumference (cm)	101	99
	• Waist circumference (cm)	107	101
	• Hip circumference (cm)	116	111
	• Biceps skin fold(mm)	3.78	3.59
	• Triceps skin fold (mm)	3.85	3.68
	• Supra inguinal skin fold (mm)	5.41	5.16
	• Sub scapular skin fold (mm)	4.33	4.16
Body composition	• Body fat%	37.9	37.9
	• Visceral fat%	17.87	17.87
	• Subcutaneous fat%	32.5	32.5
	• Skeletal muscle mass%	23.9	23.9
Vitals	• Systolic-blood pressure(mmHg)	128	126
	• Diastolic-blood pressure(mmHg)	81.3	79.33
	• Pulse (bpm)	76	75

Effect of buttermilk administration on biochemical parameters[2]

Parameters	Day 0	Day 16
Fasting glucose	94.4	85.06
Fasting insulin	9.29	13.17
Leptin	3.67	3.37
Lipid profile		
• Total cholesterol	175.8	175.1
• LDL mg%	126.1	122
• HDL mg %	36.3	35.41
• VLDL mg%	25.49	28.66
• Triglycerides mg%	127.4	143.3

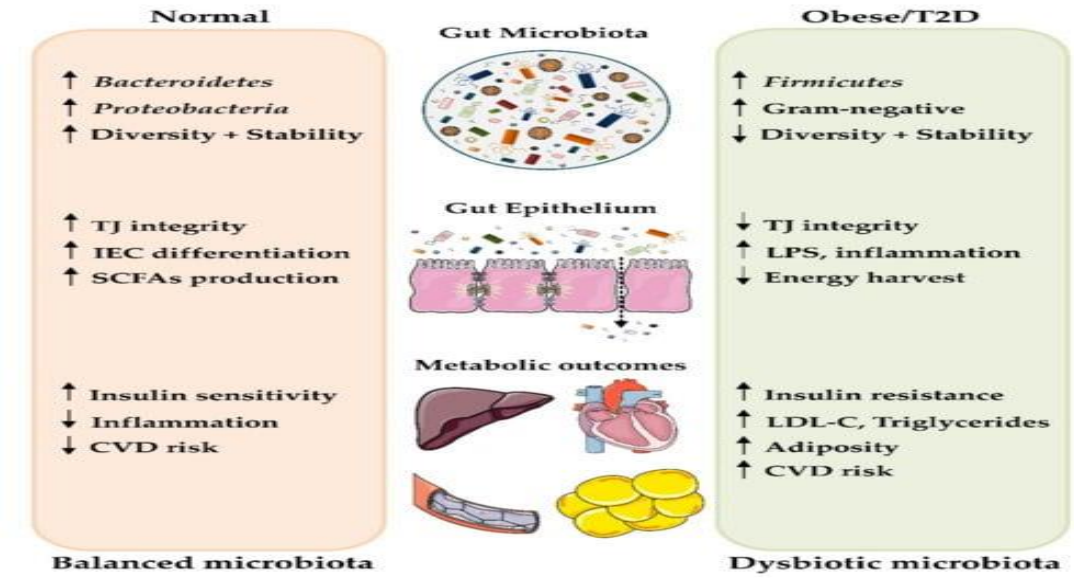
Effect of buttermilk in gut microbiota parameters[2]



The dynamic relationship between obesity and the gut microbiota

The bacteria in our gut not only play an important role in digestion but research indicates that our microbiome could also play a major role in whether or not we become obese. Humans have also been shown to exhibit the link between the gut microbiota and obesity. Low faecal

bacterial diversity is linked to greater levels of low-grade inflammation, dyslipidaemia, and overall, markedly increased adiposity in obese humans. More firmicutes and over 90% fewer Bacteroidetes were present in obese people compared to thin people. The likelihood of being fat at age 7 has been linked to variations in the faecal microbiota of new-borns.



DISCUSSION

Changes in the composition of the intestinal microbiota are related to how probiotics affect anthropometric measurements. Recent research has revealed that *shigru*, also known as the drumstick tree (Moringa oleifera Lam.), includes polyphenols that can alter the composition of the gut microbiota and are then transformed by them into bioactive chemicals, which have a significant impact on host health. Phenolic chemicals enhance the growth of some probiotics like Lactobacillus while stopping the growth of some harmful bacteria like Escherichia coli. In a study, moringa oleifera leaf extract demonstrated its potential to operate as a gut modulator in obesity-induced dysbiosis, demonstrating a strong link between higher bifidobacterial levels and less intestinal leakiness.[3] By raising the amount of Bifidobacterium spp., probiotic usage modifies the intestinal flora. Furthermore, short chain fatty acids are created by lactic acid sticks. The increased synthesis of SCFA by probiotics affects hunger and energy homeostasis.

In addition, probiotics had a beneficial effect on the populations of faecal bacterium prausnitzii, an important buttermilk has an anti- inflammatory effect. By boosting the production of tight junction proteins and mucins, the administration of probiotics improves

the intestinal barrier. This is how *takra* works to treat obesity by altering the gut flora of obese people through per rectal injection.[4]

Impact of probiotics on obesity[5]

Wang et al. conducted a meta-analysis on 12 subjects to evaluate the effect of probiotics on body weight and glycaemic control, reporting a significant reduction in body weight (BW), body mass index (BMI), and fat mass (FM). Celik and Unlu Sogut studied the impact of probiotic supplementation on chemerin levels, inflammation, and metabolic parameters in obese rats fed a high-fat diet, observing decreased weight gain and beneficial effects on insulin and fasting blood glucose levels. Qian et al. investigated the influence of dietary therapy on gut microbiota composition and function using high-fat diet (HFD), diet intervention (DI) with a low-fat diet, HFD with probiotics, and DI with probiotics, finding an increase in two butyrate-producing families. Park et al. studied the effects of *Lactobacillus plantarum* in 114 subjects, demonstrating reduced inflammation and improved intestinal permeability.

By limiting the absorption of fatty acids and raising the expression of genes linked to the oxidation of fatty acids, probiotics can reduce the size of adipocytes. In addition, the creation of SCFA during the fermentation of prebiotic fibre can positively affect the secretion of adiponectin. So, *shigru takrapana* and the *takra basthi* have a multitarget effect on gut flora as well as anthropometric and biochemical indicators in obese individuals.

To determine the involvement of medicinal plants in this process, more research is required. This issue can be clarified by a comparable investigation utilising buttermilk in its natural state. To identify non-responders to buttermilk treatment in terms of alteration of the microbiota. This could aid in determining the phenotypes that respond best to buttermilk administration.

CONCLUSION

The balance of the gut microbiota plays a part in maintaining the homeostasis of the human metabolism. As a result, when the gut microbiota is altered, it becomes more susceptible to numerous metabolic illnesses like obesity and rheumatoid arthritis, among others. Takra is a natural probiotic that cleanses the intestines, detoxifies the body, and restores the intestinal flora. Shigru Takra Pana and takra basthi have a good effect on adiponectin secretion while simultaneously altering the composition of the gut flora and causing appreciable alterations in

the anthropometric and biochemical parameters in obese people. Incorporating these dietary modifications and the management of gut microbiota into the management of metabolic illnesses may prove to be a successful strategy. Therefore, administering probiotics is seen to be a viable strategy for modulating in a positive way. Therefore, in order to link rRNA data with metabolic activities, considerable experimental data are needed. This may be particularly relevant to the various compartments of the gut microbial community.

REFERENCES

1. Patel BK, Patel SM, Pinto SV. Development of unique buttermilk by incorporation of Moringa. J Appl Nat Sci, 2017 Mar; 9(1): 466–475. doi: 10.31018/jans.v9i1.1216.
2. Mane S, Dixit KK, Lathwal N, et al. Rectal administration of buttermilk processed with medicinal plants alters gut microbiome in obese individuals. J Diabetes Metab Disord, 2021; 20: 1415–1427. doi: 10.1007/s40200-021-00879-z.
3. Aswathy YS, Anandaraman PV. Therapeutic influence of some dietary articles on gut microbiota in the pathogenesis of rheumatoid arthritis (Amavata) - A review. Ayu, 2019 Jul-Sep; 40(3): 147-151. doi: 10.4103/ayu.AYU_192_19. Epub 2020 Aug 8. PMID: 33281390; PMCID: PMC7685262.
4. Wiciński M, Gębalski J, Gołębiewski J, Malinowski B. Probiotics for the treatment of overweight and obesity in humans-A review of clinical trials. Microorganisms, 2020 Jul 29; 8(8): 1148. doi: 10.3390/microorganisms8081148. PMID: 32751306; PMCID: PMC7465252.
5. Aoun A, Darwish F, Hamod N. The influence of the gut microbiome on obesity in adults and the role of probiotics, prebiotics, and synbiotics for weight loss. Prev Nutr Food Sci, 2020 Jun 30; 25(2): 113-123. doi: 10.3746/pnf.2020.25.2.113. PMID: 32676461; PMCID: PMC7333005.