

**PHARMACO-THERAPEUTIC EVALUATION OF SNUHI-SHIKHARI
KSHARA YOG [KALPIT YOG] IN THE MANAGEMENT OF
ATISTHOULYA W.S.R. TO OBESITY**

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Article Received on
28 August 2021,
Revised on 18 Sept. 2021,
Accepted on 08 October 2021
DOI: 10.20959/wjpr202113-21992

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ABSTRACT

Obesity is a common chronic disorder of excessive body fat. Currently almost 1 in 5 men and over 1 in 6 women are overweight. *Snuhi* Regarding its properties has been said as *Katu* in *Rasa*, *Tikshna* and *Guru* in *Guna*, *Ushna* in *Virya*, *Katu* in *Vipaka* and *Apamarga* is *Katu*, *Tikta* in *Rasa*, *Laghu*, *Ruksha* in *Guna*, *Ushna* in *Virya* and *Katu* in *Vipaka*. In this study the drugs *Snuhi* and *Apamarga* were used in *Kshara* form. *Kshara* itself has *ksharana* and *lekhana* property. *Euphol* is a chemical compound of *Euphorbia neriifolia*. *B-Sitosterol* is a chemical compound of *Achyranthes aspera*. It might help reduce cholesterol levels by limiting the amount of cholesterol that is able to enter the body. Finally, it can be concluded that *Snuhi-Shikhari kshara*

Yog could be a good tools for management of *Sthoulya*.

KEYWORDS: *Sthoulya*, Obesity, *Snuhi*, *Apamarga*, Pharmacotherapeutic, *Kshara*.

1. INTRODUCTION

Obesity is a common chronic disorder of excessive body fat. Currently almost 1 in 5 men and over 1 in 6 women are overweight.^[1] Thus, The *Ayurveda* system of medicine must have the role in management of obesity without any side effects.

A. APAMARGA (*SHIKHARI*)

▪ VERNACULAR NAMES^[2]

- Sanskrit- *Shikhari, Kharmanjari*
- Hindi - *Chirchita, Chirchita, Latjira, Apamarga*
- English - Chaff Tree, Prickly Chaff Flower, Rough Chaff Tree
- Latin Name - *Achyranthus Aspera (Linn.)*

▪ CHEMICAL CONSTITUENTS^[3,4]

The plant (whole plant) and seeds contain alkaline substance specially potash, β -sitosterol, Achyranthine, Achyranthes Saponin A, B, C, D, Oleanolic acid.

▪ PHARMACOLOGICAL ACTIVITIES^[5]

Diuretic, Spasmolytic, Hypoglycemic, Purgative, Antimicrobial, Antifungal, Abortifacient, Hypotensive, Vasodilator, Cardiac depressant, Cardiac stimulant.

▪ DOSES^[6]

- *Kshara* - .5-2 g
- Fresh juice-10-20ml

B. SNUHI

● VERNACULAR NAME^[7]

- Sanskrit: *Snuhi, Snuk*
- Hindi : *Thuhar, Sehunda*
- English: Milk hedge

● CHEMICAL COMPOSITION^[8]

The latex contains water and water-solubles (69.4%-93.3%) and caoutchouc (0.2-2.6%). Euphol (whole plant and latex), euphorbol, neriifoliol, neriifolione (latex), and terpenes (plant).

● PHARMACOGNOSTICAL STUDY

▪ Macroscopic Description of *Apamarga* (*Achyranthus aspera*)^[9]

- A stiff erect herb, 30-90 cm high.
- **Stem**- Young stem irregularly quadrangular, older ones angular to nearly cylindrical, branches opposite decussate, many at the base.
- **Flower**- Bisexuals, greenish-white, arranged in long spikes, inverted.
- **Fruit**-One seeded oblong, cylindrical
- **Seeds**- Brown colored, test mealy sweet. Odour not characteristic.



"Fig.1" A. apamarga plant. "Fig.2" B. different parts of Apamarga

▪ Microscopic Description of *Achyranthes Aspera* (*Apamarga*)^[10]

• T.S of Stem

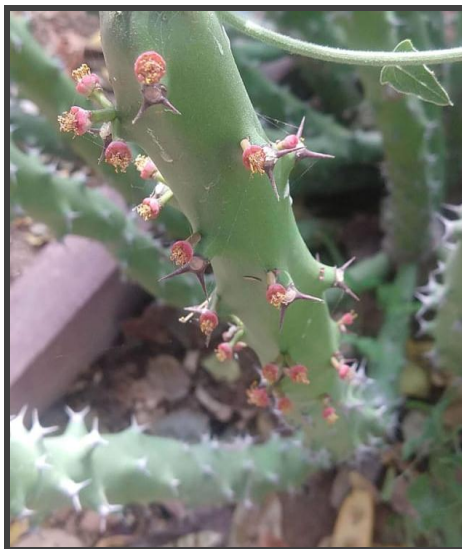
- **Epidermis**: Epidermis is single layered and covered by thick cuticle.
- **Cortex**: 6-10 layered cortex is composed of parenchymatous cells.
- **Vascular tissues**: Vascular tissues show anomalous secondary growth having 4-6 incomplete rings of xylem and phloem.
- **Cambium**: Cambial strip present between secondary xylem and phloem
- **Pith**: Pith is wide.

❖ *SNUHI*

a) Macroscopic description of *Snuhi*

- Stem, green, cylindrical, showing, spiral ridge portion only.^[11]
- **Stem**^[12]- Stems slender thick and fleshy and sometimes leafless or nearly so.

- **Leaves**^[13,14] Fleshy, obovate-oblong, 6-12 inches long, clustered towards the end of the branches. The plant drops leaves in winter.
- **Flower**- Greenish, yellow, small and surrounded by yellowish involucres, 3-7 in a cyme.
- **Fruit**- 0.6 mm, broad, 3-lobed.
- **Seed**^[15]- Greenish brown smooth, about the size of mustered.



"Fig.3" Snuhi Flowering



"Fig.4" Snuhi Stem



"Fig.5" Snuhi plant.

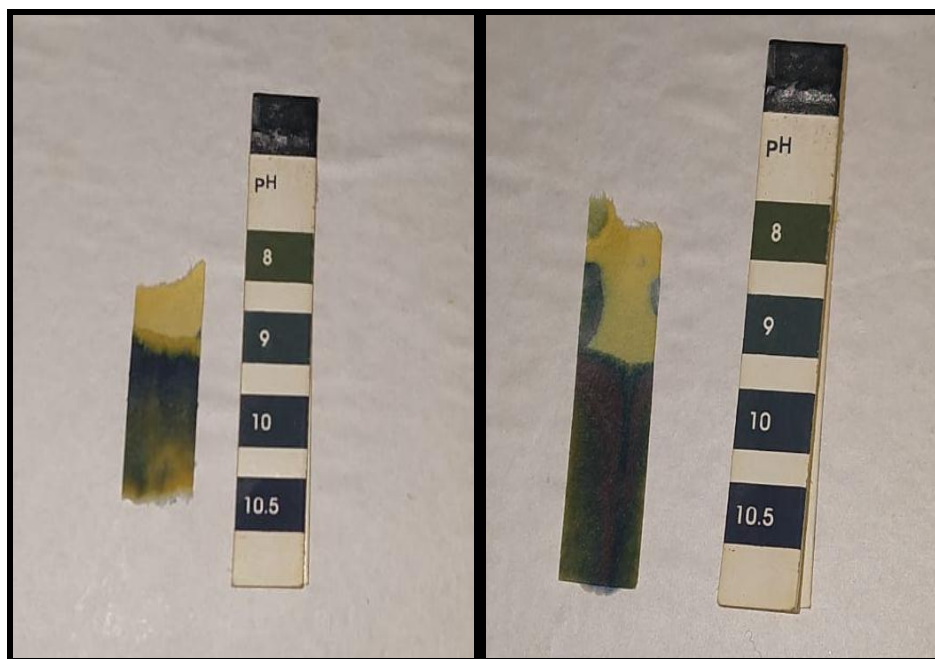
b) Microscopic description of *Snuhi*^[16]

- Transverse section shows a single layered epidermis followed by a thick zone of cortex, differentiated into two parts, outer of parenchymatous cells and inner wider zone.

- Elongated parenchymatous cells having a number of rounded and oval, latex cells, the number of latex cells gradually reduce towards outer side, below cortex, about 10 layers of phloem present, Xylem consists of vessels, tracheids, fibres and xylem parenchyma, pith consists of thin-walled, rounded or oval. parenchymatous cells, starch and calcium oxalate crystals absent.

● PHYSIO-CHEMICAL ANALYSIS OF *SNUHI-SHIKHARI KSHARA YOG*

- Sample pH Value - 10.40
- Measuring pH through litmus paper method



"Fig.6" apamarga kshara ph- between 9 to 10

"Fig.7" snuhi kshara ph- between 10-10.5

TLC RESULT

● *Apamarga*

Table No. 1.

| Sr. No. | Parameter | Result |
|---------|---------------|--|
| 1. | Apperence | Raw Herb |
| 2. | Colour | Green but violet pink at nodes |
| 3. | Odour | Characteristic |
| 4. | TLC Rf values | 366 nm-0.52,0.65,0.87 254 nm-0.5,0.15, 0.87 Visible Light- 0.5,0.15,0.87 |

Snuhi- Table No. 2

| Sr.No. | Parameter | Result |
|--------|---------------|---|
| 1. | Apperence | Stem with sharp stipular thorns |
| 2. | Colour | Green |
| 3. | Odour | Characteristic |
| 4. | TLC Rf values | 366 nm-0.14, 0.18, 0.33, 0.41, 0.55, 0.82, 0.95 254 nm-0.14, 0.18, 0.33, 0.41, 0.55 Visible Light- 0.14, 0.18, 0.33, 0.41, 0.55 |

1. TLC of *Apamarga*

"Fig.7"

a.visible light



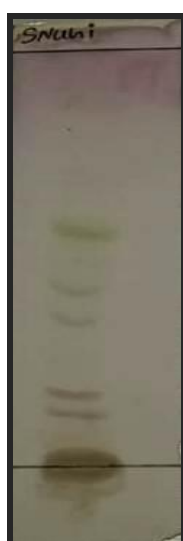
"Fig.8"

b. 254nm



"Fig.9"

c.366nm

2. TLC of *Snuhi*

"Fig.10"

a.visible light



"Fig.11"

b.254nm



"Fig.12"

c.366nm

1. Physiochemical Analysis of *Snuhi-shikhari Kshara Yoga*^[17]

Table No.3.

| Sr. No. | Physiochemical Analysis | Result | Unit |
|---------|----------------------------|--------------------------|--------|
| 1. | Foreign Matter | Nil | % w/w |
| 2. | pH (2% w/ Aq. Solution) | 10.40 | - |
| 3. | Loss on drying | 4.94 | % w/w |
| 4. | Total ash-I | 81.70 | % w/w |
| 5. | Acid Insoluble Ash-I | 6.56 | % w/w |
| 6. | Total ash-II | 79.95 | % w/w |
| 7. | Water Insoluble Ash-II | 6.42 | % w/w |
| 8. | Water Soluble Ash-II | 73.53 | % w/w |
| 9. | Alcohol Soluble Extractive | 42.93 | % w/w |
| 10. | Water Soluble Extractive | 98.18 | % w/w |
| 11. | Average weight | 320.5 | mg |
| 12. | Disintegration Time | 2-4 | minute |
| 13. | Particle size (40 Mesh) | 53.12 (Coarse powder) | % w/w |

2. MATERIALS AND METHODS

• SELECTION OF PATIENTS

20 Patients who are fulfilling the criteria attending the OPD/IPD of Dr. Sarvepalli Radhakrishnan Rajasthan Ayurved University Jodhpur has been selected for the present study irrespective of age, sex, religion, etc. were given *Snuhi-Shikhari Kshara Yog* Capsules dose of 250 mg BD with lukewarm water after meal for 60 days.

• INCLUSION CRITERIA

1. The patients age between 20-60 years.
2. The patients having clinical signs and symptoms of *Sthoulya*.
3. The patients having BMI not less than 26.
4. The patients willing to sign the consent forms.
5. Individual with abnormal lipid profiles.

• EXCLUSION CRITERIA

1. Patients having history of serious cardiac disorders like myocardial infarction, cardiac failure, uncontrolled hypertension, uncontrolled Diabetic Mellitus.
2. Patients having a history of untreated thyroid disorder.
3. Patients having hypothyroidism.
4. Hyperlipidemia due to drugs (e.g. glucocorticoids)
5. The patients with evidence of renal, hepatic and cardiac involvement.

6. Pregnant women and lactating mothers.

- **ETHICAL CLEARANCE**

Institutional Ethical Committee of Dr. S.R.RAU, Jodhpur (CTRI No. 2020/12/029535).

- **STUDYDESIGN** – The present study is supposed to be

1. Open label
2. Randomized
3. Interventional type study

➤ **ASSESSMENT CRITERIA**

The efficacy of the therapy is assessed on the basis of subjective as well as objective criteria.

- **SUBJECTIVE CRITERIA**

The detail of the score adopted for the main signs and symptoms are as follows-

1. *Chala-Sphika-Udar-Stana* (Flabbiness in Hip-Abdomen-Breast)
2. *Kshudra Swasa* (Dysnea)
3. *Daurbalya* (Weakness)
4. *Swedadhikya* (Excessive sweating)
5. *Daurgandya* (Bad odor)
6. *Pipasadhikya* (Excessive thirst)
7. *Kshudhadhikya* (Excessive hunger)
8. *Sandhishoola* (Pain in Joint)

- **OBJECTIVE CRITERIA**-It will assessed on –

- a. Body Weight
- b. Measurement of the following Circumferences
 - a. Neck
 - b. Arm
 - c. Chest
 - d. Abdomen belly
 - e. Hip
 - f. Thigh

- c. Body mass index (BMI): BMI is depended on body weight and height of person. BMI value that gets by body weight divided by square of body height. Weight is taken in kilogram and height is taken in meter. The order of corpulence according to B.M.I. is as-
- Under weight - $<18.5 \text{ kg/m}^2$
 - Normal weight - $18.5 - 24.9 \text{ kg/m}^2$
 - Over weight - $25 - 29.9 \text{ kg/m}^2$
 - Obesity (Class-1) - $30 - 34.9 \text{ kg/m}^2$
 - Obesity (Class-II) - $35 - 39.9 \text{ kg/m}^2$

4. DISCUSSION AND RESULT

For the easiness of study, discussion is divided in the following section-

- A. Discussion on Drug.
- B. Discussion on the literary review.
- C. Discussion on clinical study i.e. Observations & Results

A. DISCUSSION ON DRUG

Any drug will act in the body through the configuration called *Rasapanchaka*. *Snuhi* Regarding its properties has been said as *Katu* in *Rasa*, *Tikshna* and *Guru* in *Guna*, *Ushna* in *Virya*, *Katu* in *Vipaka* and *Apamarga* is *Katu*, *Tikta* in *Rasa*, *Laghu*, *Ruksha* in *Guna*, *Ushna* in *Virya* and *Katu* in *Vipaka*. Combination of these *Raspanchaka* is one of the best part used in for treating *Sthoulya*. In this study the drugs *Snuhi* and *Apamarga* were used in *Kshara* form. *Kshara* itself has *ksharana* and *lekhana* property.

C. DISCUSSION ON THE LITERARY REVIEW

- **Effect on Dosha**– *Sthoulya* is a *Kaphaj-Vataj Vyadhi*. Most of drugs of *Snuhishikhari kshara* yog having *Katu*, *Laghu*, *Ruksha*, *Tikshna*, *Ushna Guna* and consists of *Katu*, *Tikta Rasa*, so they cause *Shoshan*, *Lekhan*, *Amahara Karma*. It acts on *Kapha-Vata* by virtue of its *Ushna Virya*. So all *Dosha* are alleviating and body weight automatically decreases.
- **Effect on Dushya**–*Meda* and *Kleda* are the main *Dushyas* in *Sthoulya*. *Tikta* and *Katu Rasa* perform *Medokledopashoshana* action. *Ushna Virya* also helps in *Kleda* and *Meda-Vilayana* action.

- **Effect on Agni and Ama** – Main action of *Snuhishikhari kshara yog* is on *Pitta*, which means it increase *Jatharagni* (digestive fire), improves metabolic activities in the body and corrects cellular level energy. By *Deepan* and *Pachan* properties, it mainly corrects the *Medodhatvagnimandya* and checks the further progression of *Medasanchaya*.

D.DISCUSSION ON CLINICAL STUDY

➤ DISCUSSION ON SUBJECTIVE PARAMETERS

In the case of symptoms *Chala Sphika Udara Stana*, *Kshudra Swasa*, *Daurbalya*, *Swedadhikya*, *Daurgandhya*, *Pipasa*, *Kshudha Adhikya* and *Sandhishoola* the test has shown significant difference between BT and AT symptom scores.

Table No. 4: A. Subjective Parameters (By Wilcoxon Signed Ranks Test).

| Sr. No. | Symptoms | Gr. | Sum of Ranks | P | Significance |
|---------|----------------------------|-----|--------------|-------|--------------|
| 1 | <i>Chalsphikudar stana</i> | A | 480 | 0.000 | Significant |
| 2 | <i>Kshudra Swasa</i> | A | 473.50 | 0.000 | Significant |
| 3 | <i>Daurbalya</i> | A | 497.00 | 0.000 | Significant |
| 4 | <i>Swedadhikya</i> | A | 454.00 | 0.000 | Significant |
| 5 | <i>Daurgandhya</i> | A | 474.50 | 0.000 | Significant |
| 6 | <i>Pipasa</i> | A | 472.00 | 0.000 | Significant |
| 7 | <i>Kshudha Adhikya</i> | A | 459.00 | 0.000 | Significant |
| 8 | <i>Sandhishoola</i> | A | 470.00 | 0.000 | Significant |

Wilcoxon Signed Ranks test was applied to both groups separately to observe whether the difference between BT and AT score is significant or not.

DISCUSSION ON OBJECTIVE PARAMETERS

In the case of parameters Arm circumference, Neck circumference, Chest circumference, Abdomen circumference, Hip measurement, Thigh measurement, Body weight and BMI the test has shown significant difference between BT and AT symptom scores.

Table No.5: Objective Parameters (By Student's t Test for Paired data).

| Sr. No. | Parameters | T | P | Significance |
|---------|------------|--------|-------|--------------|
| 1 | Arm | 3.768 | 0.001 | Significant |
| 2 | Neck | 5.492 | 0.000 | Significant |
| 3 | Chest | 5.553 | 0.000 | Significant |
| 4 | Abdomen | 6.102 | 0.000 | Significant |
| 5 | Hip | 5.509 | 0.000 | Significant |
| 6 | Thigh | 10.370 | 0.000 | Significant |
| 7 | Weight | 13.116 | 0.000 | Significant |
| 8 | BMI | 7.718 | 0.000 | Significant |

Paired t test was applied to the group separately to observe whether the difference between BT and AT score is significant or not.

➤ OVERALL EFFECT OF THERAPY

Table No. 6: Effect of Therapy in Subjective parameters according % Relief.

| Sr. No. | Variables | % Relief |
|---------|---------------------|----------|
| 1. | Chal sphikudarsthan | 57.58 |
| 2. | KshudraSwasa | 58.33 |
| 3. | Daurbalya | 57.89 |
| 4. | Swedadhikya | 56.25 |
| 5. | Daurgandhya | 57.58 |
| 6. | Pipasa | 59.09 |
| 7. | KshudhaAdhikya | 57.58 |
| 8. | Sandhi Shoola | 55.56 |
| 9. | Average % Relief | 57.48 |

Table No. 7: Effect of Therapy in Objective parameters according % Relief.

| Sr.No. | Variables | % Relief |
|--------|-------------------------|----------|
| 1. | Arm Circumference | 4.36 |
| 2. | Neck Circumference | 2.88 |
| 3. | Chest Circumference | 2.94 |
| 4. | Abdominal Circumference | 3.59 |
| 5. | Hip Circumference | 2.79 |
| 6. | Measurement of Thigh | 5.93 |
| 7. | Body Weight | 6.92 |
| 8. | BMI | 7.26 |

Table No.: Effect of Therapy according Average change in parameters.

| Sr. No. | Average % Relief | % Relief |
|---------|------------------|----------|
| 1. | Subjective | 57.48 |
| 2. | Objective | 4.58 |
| 3. | Body Weight | 6.92 |
| 4. | BMI | 7.26 |

PROBABLE MODE OF ACTION OF SNUHI-SHIKHARI KSHARA YOG

➤ Mode of Action of *euphol* on *Sthoulya*

Euphol is a chemical compound of *Euphorbia neriifolia*. Euphol is a euphane-type triterpene alcohol that is structurally similar to cholesterol and has a wide range of pharmacological properties.^[18]

➤ Beta-Sitosterol - B-Sitosterol is a chemical compound of *Achyranthes aspera*.

Beta-sitosterol is a plant substance similar to cholesterol. It might help reduce cholesterol levels by limiting the amount of cholesterol that is able to enter the body.^[19]

➤ In the Ash of *Achyranthes aspera* basically potassium is present in a large amount.^[20] It May Reduce Water Retention.

➤ **Chemical composition of *Kshara***^[21]

Alkaline water can boost your metabolism. A higher metabolic rate means your body can burn unnecessary fat regardless of whether you're awake or asleep. *Kshara* is alkaline substances obtained from the water soluble ashes of herbal drugs.^[22]

5. CONCLUSION

The *Sthoulya* is *Kaphapradhana*, *Vatanubandha* and *Medopradoshaja Vyadhi*, *Sthoulya* is a *bahudoshaavastha*. *Kshara Kalpana* is the best measure to remove the vitiated *Kapha* and also the *Medas* which is the *Ashraya* of *Kapha*. *Kshara* helps to remove the *Kleda* from the body and their by helping to decrease the weight.

The conclusion drawn from present clinical study-

1. *Sthoulya* (Obesity) is very prevalent disease in today's world which is causing physical, mental, and social impact on the suffering individual.
2. *Sthoulya* is common in *Kapha Pitta Prakriti*.
3. *Snuhi-Shikhari Kshara Yog* is significantly effective in *Sthoulya* (Obesity).

Finally, it can be concluded that *Snuhi-shikhari kshara Yog* could be a good tools for management of *Sthoulya* and effective prevention of its complications.

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