Efficacy of Vyoshadi Guggulu and Shadushana Churna in the management of subclinical hypothyroidism: An open labelled randomized comparative pilot clinical trial

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Abstract

Background: Subclinical hypothyroidism (SCH) is defined as a mildly reduced function of the thyroid gland having elevated serum thyroid-stimulating hormone (TSH) level and normal concentrations of free tri-iodothyronine (FT3), free tetra-iodothyronine (FT4), T3 and T4. It occurs due to “Agnimandya” (low metabolic activity) at the systemic and cellular level. Vyoshadi Guggulu and Shadushana Churna having its effect on Agni (a root cause of SCH) are expected to prevent overt hypothyroidism and revert subclinical stage to euthyroid. Aim: This study was planned to evaluate and compare the efficacy of Vyoshadi Guggulu and Shadushana Churna in the management of Dhatvagnimandya with special reference to sub-clinical hypothyroidism (SCH). Materials and methods: Patients having serum TSH levels between 5 and 10 mIU/L and normal T3 and T4 values were diagnosed as SCH. A total of 30 patients were registered and randomly divided into two groups. In group A, patients were treated with Vyoshadi Guggulu (6 g), while in group B with Shadushana Churna (3 g) twice a day after lunch and dinner for 60 days. The assessment was done through changes in baseline and after treatment values of serum TSH level. Outcomes of the trial were analyzed using SigmaStat 4.0 version (trial) software. Student’s paired t-test was used for within-group assessment, while unpaired t-test was used for intergroup comparison of the normally distributed parametric data. Observations and Results: Ten patients in each group A and B could complete the course of treatment. The findings revealed that therapy in group A and B showed decrease of 16.61% (P = 0.0494) and 26.29% (P = 0.0140) in serum TSH, respectively, 1.80% (P = 0.025) and 1.36% (P = 0.019) decrease in body mass index (BMI), respectively. The decrease in TSH and BMI was statistically significant in each group. In comparison, the decrease in serum TSH (P = 0.384) and BMI (P = 0.677) was statistically insignificant. Conclusions: Vyoshadi Guggulu and Shadushana Churna are statistically equally effective to reduce serum TSH and BMI in the management of SCH.

Keywords: Agni, Dhatvagnimandya, Shadushana Churna, subclinical hypothyroidism, Vyoshadi Guggulu

Introduction

Subclinical hypothyroidism (SCH) is defined as a mildly reduced function of the thyroid gland with either minimal symptoms or no symptoms of hypothyroidism having an elevated serum thyroid-stimulating hormone (TSH) level and normal concentrations of free T3 (FT3), free T4 (FT4), T3, and T4. A large cross-sectional study confirmed that the participants with SCH reported more symptoms than euthyroid individuals, but fewer symptoms than overtly hypothyroid participants. The study could not distinguish between untreated SCH and under treated overt hypothyroidism. SCH or mild thyroid failure is more prevalent in recent years and is causing major controversies concerning management and treatment. In the Wickham study, an extensive population-based survey, the prevalence of SCH is 7.5% in women and 2.8% in men. The highest prevalence (up to 16%) was found in elderly women over 60 years of age. It is more prominent in females rather than males.
Based on Ayurvedic principles, after understand the pathology of SCH as the “Agnimandhya” (low metabolic activity) at the systemic and cellular level which can be understood as a decreased caloric expenditure (hypometabolism) in modern terminology. Agnimandhya at any level due to Kaphakara Nidana (Kapha increasing causative factors) results in increased Dhatugata Mala Sanchaya (accumulation of excretory products at a cellular level), resulting in Srotorodha (blockage of microchannels) causing compromised Dhatu – Sara (the essence of body tissues) leading to both physical and mental features in SCH, as swelling, anemia, constipation, cold intolerance, etc. This Agnimandhya results in the formation of abnormal Rasa Dhatu (semi-digested food), i.e., Ama.[7] Ama Lakshana and the symptoms seen in SCH are similar. The line of treatment of Ama Doshha revolves around Pachana (digestion of Ama) then Deepana (digestive stimulant) and lastly Shodhana (detoxification) after Snehana (medicated oiling therapy) and Swedana Karma (steam sudation).

Vyoshadi Guggulu and Shadushana Churna have been selected to manage SCH. These formulations are having Deepana (digestive stimulant), Paachana (digest and metabolize the food), Srotoshodhaka (clears microchannels of the body), Medohara (decreases fat in the body), and Lekhana (scraping of fat and lipid contents) properties. administration of these drugs improves functions of Agni. Agnimandhya (poor digestion and metabolic activity) is the prime cause of SCH. Medavaha Srotosa and Rasavaha Srotasa Dushti (vitiation of microchannels of the body carrying lipid substances and nutrients) is mainly observed in the condition of SCH. Hence, the drugs having Deepana, Pachana as well as Lekhana actions and having Raksha (dry) and Ushna (hot) Guna (property) are expected to correct the underlying pathology of the diseases and improve the condition. By their contents, Vyoshadi Guggulu and Shadushana Churna possess Agnideepana (metabolic stimulant) and weight-reducing properties. No research work has been carried out to see the effect of these trial drugs on SCH. Hence, these formulations were selected to assess and compare their efficacy in the management of SCH. The trial was planned to answer the research question that which trial drug is more effective to reduce the serum TSH level and what is their effect on body mass index (BMI).

Aims and objective
1. To evaluate and compare the efficacy of Vyoshadi Guggulu and Shadushana Churna in the management of Dhatvagnimandya w. s. r to sub-clinical hypothyroidism
2. To assess the safety of Vyoshadi Guggulu and Shadushana Churna in the management of Dhatvagnimandya w. s. r. to SCH.

Objectives
Primary objective
Reduction in serum TSH level (Time duration 60 days, assessment on the base of thyroid profile test).

Secondary objectives
1. Decrease of BMI (Time duration 60 days, assessment based on changes in BMI)
2. Safety of trial drugs (Time duration 60 days, assessment on the base of liver and renal function tests, and adverse drug reactions reported by patients if any).

Materials and methods
Selection of the patients
Patients who reported to the outpatient department of the Kayachikitsa, National Institute of Ayurveda, Jaipur, were investigated for diagnosis of SCH. Patients having any one or more conditions like family history of hypothyroidism, increasing body weight, excessive appetite, hair fall, oligomenorrhea, dry skin, fatigue, hoarseness of voice, peripheral edema, cold sensitivity, chronic constipation, or previously diagnosed case of SCH were screened for the present clinical trial. Patients were diagnosed based on thyroid profile. Patient having their serum TSH level between 5 and 10 mIU/L and normal level of serum T4 (normal reference range: T4 1–2 ng/mL and T4 5–12 mg/dL) were diagnosed as cases of SCH. A total of 30 patients fulfilling the inclusion criteria were included in the study. Selected patients were randomly divided into two groups, irrespective of their age, sex, and religion, by concealment was done by SNOSE (Sequentially Numbered Opaque Sealed Envelope) method. The study was approved by the Institutional Ethics Committee with No. IEC/ACA/2018/9 in the deliberation held on May 9–10, 2018, and the trial was also registered in the clinical trial registry of India (CTRI No: CTRI/2019/05/018988) Prior informed written consent was obtained from each patient before including in the study. A detailed clinical research pro forma, incorporating all the points of history taking, physical examination, and assessment of the treatment, was maintained for record and analysis purposes.

Inclusion criteria
A subject fulfilling the following criteria were eligible for inclusion in this study:
1. Patients age between 18 and 60 years of either sex
2. Newly/previously diagnosed patients having TSH level 5–10 mIU/L
3. Patients having symptoms any one or more conditions like family history of hypothyroidism, increasing body weight, excessive appetite, hair fall, oligomenorrhea, dry skin, fatigue, hoarseness of voice, peripheral edema, cold sensitivity, chronic constipation
4. Patients willing to participate in the study.

Exclusion criteria
1. Patients below 18 years and above 60 years of age
2. TSH level more than 10 mIU/L or < 5 mIU/L
3. Patients under allopathic treatment for subclinical or clinical hypothyroidism
4. Patients suffering from any other systemic illness viz. diabetes, hypertension, liver disorders, etc
5. Pregnant and lactating patients
6. Patients undergoing treatment for any other systemic illness
7. Patients participated in any clinical trial within the last 6 months.

**Trial drug details**

**Vyoshadi Guggulu**

Vyoshadi Guggulu is a polyherbal formulation mentioned in Brihat Nighantu Ratanakar. The ingredients of Vyoshadi Guggulu are mentioned in Table 1.[9]

**Method of preparation of Vyoshadi Guggulu**

The herbal ingredients of Vyoshadi Guggulu such as Shunthi, Maricha, Pippali, Haritaki, Vibhitaka, Amalaki and Kanchanaara were purchased from local market and authenticated by the purchasing and authentication committee of raw drugs of the pharmacy. These drugs were taken according to the mentioned ratio [Table 1] and made into a fine powder and passed from 80# sieve. The purified Guggulu powder and honey (purchased from local market) added to the herbal powder as per the quantity mentioned. Then, all the mixtures were amalgamated well and finally, semisolid Vyoshadi Guggulu was prepared in Vati form.

This drug was prepared in the GMP-certified pharmacy of the Institute.

**Shadushana Churna**

Shadushana Churna is a polyherbal formulation mentioned in Bhava Prakash Nighantu Haritakyadi Varga. The ingredients of Shadushana Churna are mentioned in Table 2.[9]

**Method of preparation of Shadushana Churna**

Ingredients of Shadushana Churna [Table 2] were taken in equal quantity and made into fine powder. The contents of Shadushana Churna were purchased from local market authenticated by the purchasing and authentication committee of raw drugs of the GMP-certified pharmacy. It was prepared in pharmacy of the Institute as per the classical description of Churna Kalpana mentioned in Churna preparing chapter of Sharangdhar Samhita.[10]

**Grouping and posology**

Patients in group A were treated with Vyoshadi Guggulu Vati 6 g twice a day after lunch and dinner orally with Anupana (vehicle) of lukewarm water for 60 days. Patients in group B were treated with Shadushana Churna 3 g twice a day after lunch and dinner orally with Anupana (vehicle) of lukewarm water for 60 days.

**Assessment criteria**

The primary outcome was assessed based on the change in baseline and after treatment (After 60 days) value of serum TSH. The effect of trial drugs on BMI was assessed based on change in baseline and after treatment value of BMI. BMI was calculated by dividing weight (in kg) by square of height in meter. Safety of trials drugs was assessed through liver function test (serum glutamic oxaloacetic transaminase [SGOT], serum glutamic pyruvic transaminase [SGPT]), and renal function test (serum creatinine and blood urea).

**Statistical methods**

Sigma state 4.0 version, manufactured by Informer Technologies, Inc. was used to find the standard deviation, standard error, t-value (Student’s paired and unpaired t-test calculated value), and P (probability) values. Student’s paired t-test was used to assess the level of significance for changes in baseline and after treatment values for objective parameters. Unpaired t-test was used to assess the level of significance between two groups for objective parameters. The obtained results were interpreted as:

- Not significant: $P > 0.05$
- Significant: $P < 0.05$
- Highly significant: $P < 0.01$, $P < 0.001$, $P < 0.0001$.

**Observation**

Patients for the present clinical trial were registered between the periods of June 2019 and February 2020. After 6 months of the clinical study, registration of the patients was closed having to submit the thesis work to the institute being a part of fulfillment for postgraduation degree. A total of 30 patients were registered for the present study and were randomly divided into two groups to evaluate comparative the efficacy of Vyoshadi Guggulu and Shadushana Churna in the management of Dhatvagnimandya w. s. r to SCH. Twenty-one patients completed the treatment successfully. In this trial, 15 patients in each group were allocated to the intervention of group A and group B. Ten patients in group A and 11 patients in group B could complete the course of treatment, while five
patients in group A and four patients in group B could not come for follow-up due to lockdown because of COVID-19 pandemic [Figure 1].

In the present study, a maximum of 36.67% of patients were in the age group 31–40 years, 86.67% of the patients were female, 76.67% of patients from the Hindu community, 80% were married, 36.67% of patients were found to have graduate educational status, 60% of patients were observed to be of middle socioeconomic status, the maximum number of patients (56.67%) were housewives, 66.67% of patients were taking Madhura Rasa dominant diet, 63.33% of patients were vegetarian, 66.67% of patients were from the urban area, 60% of patients had a history of Mandagni (poor digestion and metabolic activities), 56.67% of patients had regular bowel habit, 60% of patients had normal sleep and 36.67% of female patients had a regular menstrual cycle.

Results

In the present clinical study, serum TSH was decreased by 16.61% and 26.29%, respectively, in group A and group B, which was statistically significant \( (P < 0.05) \). Serum \( T_3 \) and serum \( T_4 \) were within normal limits before and after treatment in all the patients in both the groups [Table 3]. On applying the unpaired \( t \)-test, the difference of decrease in serum TSH in group A and group B was statistically insignificant [Table 4].

The baseline average weight of patients in group A and group B was 63.70 kg and 67.36 kg, respectively. Weight was decreased by 1.57% and 1.35%, respectively, in group A and group B, which was statically significant \( (P < 0.05) \). The baseline BMI of patients in group A and group B was 23.86 and 25.49 \( \text{kg/m}^2 \), respectively. BMI was decreased by 1.80% and 1.36%, respectively, in group A and group B, which was statistically significant \( (P < 0.05) \). The vitals such as pulse and systolic and diastolic blood pressure were normal in all the patients in both the groups before and after treatment [Table 5]. On applying the unpaired \( t \)-test, the difference of decrease in weight and BMI in group A and group B was statistically insignificant [Table 6].

Liver function parameters (SGOT and SGPT) and renal function parameters (blood urea and serum creatinine) were within normal limits before and after treatment. No adverse drug reaction was observed in any groups throughout the study period [Table 7].
Discussion

The trial drugs Shadushana Churna and Vyoshadi Guggulu are classical drugs and the doses mentioned in the classics for these drugs are 6 g and 12 g, respectively. Both the trial drugs, having Ushna and Tikshana (hot and fast-acting) properties, induce a burning sensation in the stomach if given an empty stomach. For the better adherence of the trial patients, drugs were given after lunch and dinner with lukewarm water for prompt assimilation of the drug without any untoward effect.

In the present study among 30 patients, the maximum number of patients (36.67%) belonged to the 31–40 years age group. This result showed that the maximum prevalence of SCH is in adults. SCH can start at any age, but the risk increases with age. SCH also increases vascular risk in all age groups but more significantly in the older age group.[11] A maximum of 86.67% of females was found to be affected by the ailment, it may be due to the effect of estrogen hormone.[12]

Some patients with SCH may experience symptoms associated with the disease, while some remain asymptomatic. Few studies also suggested its link to overt hypothyroidism and long-term complications like high risk of coronary artery diseases. The risk for the progress of the disease to overt hypothyroidism is about 2%–5% per year. The risk increases with a high level of serum TSH level and the presence of thyroid peroxidase-specific antibodies.[13,14]

Initiation of treatment with hormone replacement therapy or levothyroxine for SCH is controversial. Most of the guidelines recommend hormone replacement therapy or

Table 3: Effect of therapy on thyroid function test (paired t-test)

| Variable       | n  | Group | Mean difference | SD± | SE± | t    | P    | Results      |
|----------------|----|-------|-----------------|-----|-----|------|------|--------------|
| Serum T₃ (µg/dL) | 10 | A     | 1.156           | 0.509 | 0.0891 | 0.384 |     | NS           |
|                | 11 | B     | 1.892           | 0.637 |       |      |     |              |

Table 4: The comparative effect of both the interventions on thyroid profile (unpaired t-test)

| Variable       | n  | Group | Difference mean | SD± | SE± | t    | P    | Results      |
|----------------|----|-------|-----------------|-----|-----|------|------|--------------|
| Serum TSH (µIU/mL) | 10 | A     | 1.35↓           | 0.0405 | 0.0118 | 0.907 |     | NS           |
|                | 11 | B     | 1.044           | 0.0380 |       |      |     |              |

Table 5: The effect of therapy on vitals, weight, and body mass index (paired t-test)

| Variable       | n  | Group | Mean difference | Percentage relief | SD± | SE± | t    | P    | Results      |
|----------------|----|-------|-----------------|-------------------|-----|-----|------|------|--------------|
| Pulse rate     | 10 | A     | 0.6             | 0.73              | 0.078 | 0.128 | 1.06 | <0.05 (0.015) | NS           |
|                | 11 | B     | 0.27            | 0.39              | 0.060 | 0.096 | 1.00 | <0.05 (0.006) | NS           |

n: Total number of patients, ↓: Decrease, S: Significant, NS: Nonsignificant, SD: Standard deviation, SE: Standard error, BT: Before treatment, AT: After treatment, P: Probability value, TSH: Thyroid-stimulating hormone, T₃: Triiodothyronine, T₄: Tetraiodothyronine

Discussion

The trial drugs Shadushana Churna and Vyoshadi Guggulu are classical drugs and the doses mentioned in the classics for these drugs are 6 g and 12 g, respectively. Both the trial drugs, having Ushna and Tikshana (hot and fast-acting) properties, induce a burning sensation in the stomach if given an empty stomach. For the better adherence of the trial patients, drugs were given after lunch and dinner with lukewarm water for prompt assimilation of the drug without any untoward effect.

In the present study among 30 patients, the maximum number of patients (36.67%) belonged to the 31–40 years age group. This result showed that the maximum prevalence of SCH is in adults. SCH can start at any age, but the risk increases with age. SCH also increases vascular risk in all age groups but more significantly in the older age group.[11] A maximum of 86.67% of females was found to be affected by the ailment, it may be due to the effect of estrogen hormone.[12]

Some patients with SCH may experience symptoms associated with the disease, while some remain asymptomatic. Few studies also suggested its link to overt hypothyroidism and long-term complications like high risk of coronary artery diseases. The risk for the progress of the disease to overt hypothyroidism is about 2%–5% per year. The risk increases with a high level of serum TSH level and the presence of thyroid peroxidase-specific antibodies.[13,14]

Initiation of treatment with hormone replacement therapy or levothyroxine for SCH is controversial. Most of the guidelines recommend hormone replacement therapy or
levothyroxine in SCH when the serum TSH level is more than 10 mIU/L.\(^{[15]}\) There is no evidence of benefits or reduction in harms for treatment of SCH with levothyroxine. Treatment of SCH with levothyroxine has also a concern for lifelong drug dependency and adverse effects of the drug. In addition, patients\(^{[16]}\) particularly female patients of SCH, are more health-conscious about gradual weight gain and menstrual abnormalities and also feel anxious about deterioration or converting to overt hypothyroidism if not treated.

Findings of the present study suggest that Vyoshadi Guggulu and Shadushana Churna have significantly decreased serum TSH levels by 16.61% and 26.29%, respectively. A decrease in BMI by Vyoshadi Guggulu and Shadushana Churna was 1.80% and 1.36%, respectively, which was statistically significant. The difference in the decrease in serum TSH and BMI through Vyoshadi Guggulu and Shadushana Churna was statistically not significant.

The practical utility of the findings of this study is that Vyoshadi Guggulu and Shadushana Churna may be useful to lower the serum TSH level and reduce or prevent further weight gain in patients of SCH where no treatment is recommended or not any evidence for benefits with treatment in western medical science. The efficacy of these drugs on the menstrual problem related to the condition needs to be explored. No adverse effect of trial drugs was reported throughout the study. It implies that the drugs are safe for use. The findings of this trial are based on the treatment of a fewer number of patients. It needs to be verified through well-designed randomized controlled trial with an appropriate sample size.

**Table 6: Comparative effect of both the interventions on weight and body mass index (unpaired t-test)**

| Variable     | n  | Group | Difference mean | SD± | SE± | t   | P           | Results     |
|--------------|----|-------|-----------------|-----|-----|-----|-------------|-------------|
| Weight (kg)  | 10 | A     | 1.00            | 1.054 | 0.333 | 0.198 | >0.05 (0.845) | NS          |
|              | 11 | B     | 0.91            | 1.044 | 0.315 |      |             |             |
| BMI (kg/m²)  | 10 | A     | 0.43            | 0.506 | 0.160 | 0.423 | >0.05 (0.677) | NS          |
|              | 11 | B     | 0.35            | 0.408 | 0.123 |      |             |             |

n: Total number of patients, NS: Nonsignificant, SD: Standard deviation, SE: Standard error, P: Probability value, BMI: Body mass index

**Table 7: The effect of therapy on renal and liver function test (paired t-test)**

| Variable     | n  | Group | Mean difference | Percentage relief | SD± | SE± | t   | P           | Results     |
|--------------|----|-------|-----------------|-------------------|-----|-----|-----|-------------|-------------|
| SGOT (U/L)   | 10 | A     | 0.25            | 0.19              | 9.56↓| 14.01| 0.682 | >0.05 (0.513) | NS          |
|              | 11 | B     | 0.32            | 0.26              | 2.03↓| 10.52| 0.201 | >0.05 (0.845) | NS          |
| SGPT (U/L)   | 10 | A     | 0.23            | 0.18              | 12.70↓| 21.06| 0.695 | >0.05 (0.505) | NS          |
|              | 11 | B     | 0.24            | 0.19              | 2.51↓| 11.56| 0.219 | >0.05 (0.831) | NS          |
| Blood urea (mg/dl) | 10 | A    | 0.25            | 0.19              | 4.80↓| 4.834| 0.641 | >0.05 (0.537) | NS          |
|              | 11 | B    | 0.24            | 0.18              | 2.97↓| 5.177| 0.400 | >0.05 (0.697) | NS          |
| Serum creatinine (mg/dl) | 10 | A   | 0.23            | 0.18              | 1.18↓| 0.0738| 0.233 | >0.05 (0.678) | NS          |
|              | 11 | B    | 0.24            | 0.18              | 0.10↑| 0.134| 0.405 | >0.05 (0.983) | NS          |

↓: Decrease, ↑: Increase, NS: Nonsignificant, SD: Standard deviation, SE: Standard error, BT: Before treatment, AT: After treatment, P: Probability value, SGOT: Serum glutamic oxaloacetic transaminase, SGPT: Serum glutamic pyruvic transaminase

**Probable mode of actions of trial drugs**

Contents of Vyoshadi Guggulu such as Shunthi (Zingiber officinale Rosc.), Pippali (Piper longum Linn.), Haritaki (Terminalia chebula Retz.), Vibhitaka (Terminalia bellirica Roxb.), Amalaki (Embelica officinalis Gaertn.), Kanchanaaar (Bauhinia variegate Linn.), Guggulu (Commiphora mukul Engl.), and Madhu (honey) have predominantly Katu (pungent), Tikta (bitter) Rasa, Laghu, Ruksha, Teekshna Guna, Ushna Veyra and Katu Vipaka. Tikta Rasa has Lekhana Guna that scrubs out excessive Kapha and Meda from the Srotasa (microchannels). Katu Rasa increases Vata and Pitta while decreases Kapha and stimulates the digestive fire. It removes the obstruction and thus corrects the Srotorodha. Hence, it is apparent that by their Rasas, these drugs are likely to have Kaphashamaka and Medohara properties. Teekshna Guna acts on the channels immediately and removes the obstruction. These Guna also activate the Jatharagni and Dhatawagni and maintain their normal physiological status. Ushna Veyra is accountable for increasing the basal metabolic rate and oxygen consumption and accelerates the breakdown of fat at the mitochondrial level. The majority of the drugs have Katu Vipaka which enhances the Jatharagni and Dhatawagni and normalizes the metabolic processes. Katu Vipaka drugs reduce the Kapha and Meda contents of the body.

Kanchanaar is one among the contents of Vyoshadi Guggulu and indicated in thyroid gland dysfunctions and releases thyroidal hormones. Guggulu or Commiphora Mukul possesses thyroid stimulating activity and it reduces cholesterol and stimulates phagocytosis by increasing leukocytes.\(^{[17‑19]}\)
Shadushana Churna contains Pippali, Pippalimoola, Chavya, Chitraka, Shuthi, and Maricha. Pippali has been mentioned as Deepaniya, Paachaniya and Anahaprashamana by Acharya Charaka. The contents of Shadushana Churna by their atu Rasa and Ushna Veerya lead to stimulation of Agni and mitigate vitiated Kapha Dosha. In most Ayurvedic classics, Pippali has been stated to be “Yogvahi Dravya” which means that when Pippali is combined with other drugs, it potentiates their activities by maintaining its pharmacological actions.[20]

Safety of trial drugs

No adverse effect of drugs was observed during the entire clinical trial and liver function tests as well as renal function tests were within normal limits before and after treatment. Hence, it can be said that both the trial drugs are safe for mentioned doses for clinical practice.

Conclusions

Vyoshadi Guggulu and Shadushana Churna are clinically safe and effective in the management of SCH. Vyoshadi Guggulu and Shadushana Churna are statistically equally effective to reduce serum TSH and BMI in patients with SCH. Shadushana Churna is clinically better to reduce elevated serum TSH levels than Vyoshadi Guggulu. Vyoshadi Guggulu can be a choice of drug for obese cases and Shadushana Churna can be a choice of drug for nonobese cases of SCH.

 Recommendation for future research work

1. It is recommended that a randomized clinical trial on a larger number of patients should be carried out to confirm and establish the efficacy of Vyoshadi Guggulu and Shadushana Churna in SCH

2. The future study should be carried out on two strata of patients like obese and nonobese cases of SCH and the efficacy of Vyoshadi Guggulu in obese patients and Shadushana Churna in nonobese patients of SCH should be explored.

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Conflicts of interest

There are no conflicts of interest.

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