Original Article

Evaluation of the effect of *Kanchnara Guggulu* and *Tankana-Madhu Pratisarana* in the management of *Tundikeri* (tonsillitis) in children

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Abstract

Introduction: Tonsillitis is a common illness in the childhood period. There are about 7,455,494 cases of tonsillitis in India per year. Tonsillitis can be compared with *Tundikeri* in Ayurveda. In the present study, *Kanchnara Guggulu* tablets and *Pratisarana* of *Tankana-Madhu* were selected. **Aim:** To evaluate the effect of *Kanchnar Guggulu* and *Tankana-Madhu Pratisarana* in the management of *Tundikeri* in children. **Materials and Methods:** In the present study, a total of 31 patients aged between 5 and 16 years attending the outpatient department of Kaumarbhritya Department and Shalakya Tantra Department were registered. Among them, 26 patients completed the treatment. *Kanchnara Guggulu* tablets were administered orally in Group A and in Group B, *Pratisarana* with *Tankana-Madhu* was done along with the oral administration of *Kanchnara Guggulu* tablets. **Results:** The results showed that in Group A, 21.43% of patients got complete remission, 42.86% of patients got marked improvement and 35.71% of patients got moderate improvement. In Group B, 25% of patients got complete remission, 58.33% of patients got marked improvement and 16.67% of patients got moderate improvement. **Conclusion:** Both the groups showed highly significant results in all cardinal and associated features of *Tundikeri*. *Kanchnara Guggulu* and *Tankana-Madhu Pratisarana* are a safe and effective modality for the treatment of *Tundikeri*.

Keywords: *Kanchnara Guggulu, Pratisarana*, Tonsillitis, *Tundikeri*

Introduction

Tonsillitis is a common illness in the childhood period resulting from pharyngitis. A person of any sex and age may fall victim to bacterial infection, leading to tonsillitis. It is a common condition with nearly all children being infected at least once.[1] There are about 7,455,494 cases of tonsillitis in India per year and about 200,000 tonsillectomies are performed in India per year.[2] Any infection in a growing child usually hampers the immune system and the routine growth and development and when there are repeated attack, it is seen more. Recurrent tonsillitis is seen commonly in children and this has many adverse effects on the normal growth and development of the child among these missing school days; economic burden of treatment, etc. are few to name. The repeated tonsillitis wherein the tonsil gland gets inflamed and enlarged repeatedly, after treatment the size remains same though the inflammation subsides which leads to obstruction in the throat both to airways and digestive tract, which may pose problems in deglutition later. Besides medical management with antibiotics, the only other option is surgical removal of tonsils.

A disease which is similar to tonsillitis in clinical presentation in Ayurveda is *Tundikeri* which is described under *Mukha Roga*. Dealing with the treatment of the disease *Tundikeri* particularly, *Acharya* Sushruta mentions that *Tundikeri* is the *Bhedya Roga* and it should be treated as per the line of treatment of the disease *Galashundika*.[3] All drugs should have the properties such as *Lekhana, Shothahara, Sandhaniya, Ropana, Rakta Stambhana* and *Vedana Sthapana*. The drug *Kanchnar Guggulu* has all the above properties and it is indicated in the

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conditions such as *Granthi, Apachi, Galaganda* and *Shotha*. Therefore, the present study was planned to evaluate the effect of *Kanchnar Guggulu* and *Tankana-Madhu Pratisarana* in the management of *Tundikeri* (tonsillitis).

Materials and Methods

Patients who fulfilling the inclusion criteria were selected from the outpatient Department of Kaumarbhritya and Shalakya Tantra of IPGT and RA. The ethical clearance for the same trial in children was obtained from the institutional ethics committee (Ref-PGT/7-A/2012-13/1964 dated: 21-09-2012). Trial was registered in the Clinical Trial Registry of India (CTRI), Reg. no. CTRI/2013/05/003635 (Registered on: 13/05/2013).

Inclusion criteria

Children aged between 5 to 16 years with sign and symptoms of *Tundikeri* (tonsillitis) belonging to either sex were included.

Exclusion criteria

- Patients aged below 5 years and above 16 years were excluded.

Laboratory investigations

1. Blood: Hemoglobin percent, total leukocyte count, differential leukocyte count, erythrocyte sedimentation rate (ESR), and absolute eosinophil count
2. Urine: Routine and microscopic
3. Stool: Routine and microscopic
4. Throat swab.

Plan of intervention

- Group A: *Kanchnara Guggulu* tablets were administered orally
- Group B: *Pratisarana* of *Tankana-Madhu* was done along with oral administration of *Kanchnara Guggulu* tablets.

All the ingredients were procured from the Pharmacy, Gujarat Ayurved University (GAU), Jamnagar and authenticated by the Pharmacognosy Laboratory, IPGT and RA, GAU, Jamnagar.

Drug, dose and duration of the different groups are summarized in [Table 1].

According to the Clark's rule,

$$\text{Child dose} = \frac{\text{Adult dose} \times \text{Wt. in pound}}{150}$$

After completion of treatment, follow-up was carried out for 6 weeks.

Criteria for assessment

The effect of therapy was assessed by subjective as well as objective criteria, before and after the treatment. Special scoring pattern was prepared to assess each sign and symptom [Table 2].

Criteria for overall assessment

Overall effect of therapy was assessed by below-given criteria:

1. Complete remission: One hundred percent improvement in clinical signs and symptoms
2. Marked improvement: More than 75% improvement in clinical signs and symptoms
3. Moderate improvement: More than 50% and up to 75% improvement in clinical signs and symptoms
4. Mild improvement: More than 25% and up to 50% improvement in clinical signs and symptoms
5. No improvement: Equal to or less than 25% improvement in clinical signs and symptoms.

Statistical analysis

For the analysis of data, paired and unpaired *t*-test were applied, respectively, for thorough statistics within the group and comparison between the groups, and $P < 0.05$ or $P < 0.01$ was considered as statistically significant, $P < 0.001$ as highly significant, and $P > 0.05$ as insignificant.

Observations and Results

A total of 31 patients (16 patients in Group A and 15 patients in Group B) were registered in the present study. Among them, 14 patients in Group A and 12 patients in Group B completed the treatment. Two patients were discontinued in Group A and three patients discontinued in Group B. One patient discontinued due to irregular visit. One discontinued due to transfer of his father out of Gujarat. One patient did not came for after treatment evaluation.

In the clinical study, maximum number (45.16%) of patients belong to the age group of 7–10 years. Majority of the patients were males (67.74%), belong to Hindu religion (96.77%), had completed primary education (67.74%) and were from middle-class family (87.10%).

Table 1: Drug, dose, and duration

Groups	Group A				
	Drug	**Dose**	**Duration**	***Anupana***	***Aushadhakaal***
Group A	*Kanchnara Guggulu*	As per Clark's rule	6 weeks	*Koshna jal*	*Adhobhakta* (2 times a day)
Group B	*Kanchnara Guggulu* and *Tankana-Madhu Pratisarana*	As per Clark's rule	6 weeks	*Koshna jal*	*Adhobhakta* (2 times a day)
		Tankana- 125 mg and Madhu- QS	1 week (3 sets of *Pratisarana* given with interval of 1 week)		2 times a day (morning - evening)

QS: Quantum satis

Table 2: Criteria for scoring pattern

Symptoms	Score
Toda (pricking pain)	
No pain	0
Mild tenderness on pressing	1
Pain during deglutition	2
Pain during rest	3
Daha (burning sensation)	
No burning sensation	0
Occasional localized burning sensation	1
Localized mild burning sensation in a particular hour of day	2
Burning sensation throughout the day but tolerable	3
Intolerable (affecting daily routine activity) generalized burning sensation throughout the day	4
Shotha (inflammation)	
No swelling	0
Tonsils cover 25% of oral cavity	1
Tonsils cover 50% of oral cavity	2
Tonsils cover 75% of oral cavity	3
Tonsils cover >75% of oral cavity	4
Jwara (fever)	
Normal temperature	0
98.6-100	1
100-102	2
>102	3
Raaga (redness of tonsils)	
No erythema	0
Faint	1
Light red	2
Moderate red	3
Bright red	4
Aruchi (anorexia)	
Normal taste in food, feeling to eat food in time	0
Aruchi-feeling to take food but not having taste	1
Anannabhilasha-not feeling to take food even if hungry	2
Bhaktadvesha-aversion to food	3
Abhaktachchanda	4
Nirgalana Kathinya (Dysphagia)	
No difficulty	0
Difficulty in taking solid food only	1
Difficulty in taking solid and liquid food	2
Difficulty in swallowing saliva itself	3
Sore throat	
No sore throat	0
Sore throat with pain but no difficulty in taking food	1
Sore throat with pain and difficulty in taking food	2
Sore throat with difficulty in taking liquid too	3
Mukha Daurgandhya (Halitosis)	
No halitosis	0
Present only when mouth is completely opened	1
Present during talking	2
Swara Bheda (Hoarseness of voice)	
No hoarseness	0
Hoarseness after long and loud talk	1
Hoarseness throughout day but no difficulty in speech	2
Cannot speak	3
Lasika Granthi Vriddhi (Enlargement of lymph node)	
Not palpable	0
Unilateral enlargement	1
Bilateral enlargement of lymph node	2
Visible-prominent lymph node	3

The cardinal features reported were *Toda* (pricking pain) (100%), *Shotha* (inflammation) (100%), *Daha* (burning sensation) (41.94%) and *Jwara* (fever) (41.94%). Associated symptoms reported were *Raaga* (redness) (100%), *Aruchi* (anorexia) (67.74%), dysphagia (87.10%), sore throat (61.29%), halitosis (45.16%), hoarseness of voice (45.16%) and enlargement of lymph node (100%).

In Group A, mean hemoglobin (Hb) percent was 11.56 g/dl, mean total leukocyte count was 7742.9/cmm, mean neutrophil count was 49.21%, mean lymphocyte count was 42.86%, mean eosinophil count was 5.57%, mean monocyte count was 2.36%, mean ESR was 13.71 mm after 1st h, and absolute eosinophil count was 439.29/cmm. In Group B, mean Hb was 12.01 g/dl, mean total leukocyte count was 8658.3/cmm, mean neutrophil count was 52.83%, mean lymphocyte count was 39.33%, mean eosinophil count was 4.92%, mean monocyte count was 2.92%, mean ESR was 11.50 mm after 1st h, and mean absolute eosinophil count was 387.50/cmm. There was no any abnormality detected in urine routine and microscopic investigations. Microbiological investigations of the throat swabs in Group A showed the presence of Gram-positive cocci in 93.75% of the patients and Gram-negative short rods in 93.75% of patients, fungal filaments in 75% of the patients and fungal hyphae in 68.75% of patients. Microbiological investigations of the throat swabs in Group B showed the presence of Gram-positive cocci in 100% of the patients and Gram-negative short rods in 100% of patients, fungal filaments in 53.33% of the patients, and fungal hyphae in 46.67% of patients.

Effect of therapies

On cardinal features

In *Toda*, statistically highly significant ($P < 0.001$) reduction of 87.88% and 90% was observed in Group A and Group B, respectively. In *Shotha*, Group A and Group B showed statistically highly significant ($P < 0.001$) reduction of 70.59% and 77.14%, respectively. In *Daha*, statistically highly significant reduction ($P < 0.001$) of 81.82% and 90% was observed in Group A and Group B, respectively. *Jwara* was relieved 100% in both the groups [Tables 3 and 4].

On associated features

In *Raaga*, statistically highly significant ($P < 0.001$) reduction of 84.62% and 91.30% was observed in Group A and Group B, respectively. In *Aruchi*, Group A and Group B showed statistically highly significant ($P < 0.001$) reduction of 84.21% and 83.33%, respectively. In dysphagia, statistically

highly significant ($P < 0.001$) reduction of 77% and 86.36% was observed in Group A and Group B, respectively. In sore throat, statistically highly significant ($P < 0.001$) reduction of 71% and 76.19% was observed in Group A and Group B, respectively. In halitosis, Group A and Group B showed statistically highly significant ($P < 0.001$) reduction of 70% and 80%, respectively. In hoarseness of voice, statistically highly significant ($P < 0.001$) reduction of 73% and 80% was observed in Group A and Group B, respectively. In size of lymph node, statistically highly significant ($P < 0.001$) reduction of 85% and 81.82% was observed in Group A and Group B, respectively [Tables 5 and 6].

On hematological parameters

In Hb percent, Group A showed statistically insignificant ($P > 0.05$) decrease (0.99%) and Group B showed statistically insignificant ($P > 0.05$) increase (1.73%). In total leukocyte count, statistically insignificant ($P > 0.05$) increase by 15.22% and 2.21% was observed in Group A and Group B, respectively. In neutrophil count, statistically insignificant ($P > 0.05$)

Table 3: Effect of therapy on cardinal symptoms in Group A

Signs and symptoms	*n*	Mean score			Percentage relief	SD±	SE±	*t*	*P*
		BT	AT	X					
Toda (pricking pain)	14	2.36	0.29	2.07	87.88	0.62	0.16	12.59	<0.001*
Shotha (swelling)	14	2.43	0.71	1.71	70.59	0.61	0.16	10.49	<0.001*
Daha (burning sensation)	6	1.83	0.33	1.5	81.82	0.55	0.22	6.708	<0.001*
Jwara (fever)	6	-	-	-	100	-	-	-	-

*Highly significant. *n*: Number of patients, BT: Before treatment, AT: After treatment, SD: Standard deviation, SE: Standard error

Table 4: Effect of therapy on cardinal symptoms in Group B

Signs and symptoms	*n*	Mean score			Percentage relief	SD±	SE±	*t*	*P*
		BT	AT	X					
Toda (pricking pain)	12	2.50	0.25	2.25	90	0.45	0.13	17.23	<0.001*
Shotha (swelling)	12	2.92	0.67	2.25	77.14	0.75	0.22	10.34	<0.001*
Daha (burning sensation)	6	1.67	0.17	1.5	90	0.55	0.22	6.708	<0.001*
Jwara (fever)	6	-	-	-	100	-	-	-	-

*Highly significant. *n*: Number of patients, BT: Before treatment, AT: After treatment, SD: Standard deviation, SE: Standard error

Table 5: Effect of therapy on associated symptoms in Group A

Signs and symptoms	*n*	Mean score			Percentage relief	SD±	SE±	*t*	*P*
		BT	AT	X					
Raaga	14	1.86	0.29	1.57	84.62	0.51	0.14	11.45	<0.001*
Aruchi	9	2.11	0.33	1.78	84.21	0.44	0.15	12.10	<0.001*
Dysphagia	13	2.0	0.46	1.54	77	0.52	0.14	10.69	<0.001*
Sore throat	11	2.55	0.73	1.82	71	0.87	0.26	6.90	<0.001*
Halitosis	6	1.67	0.50	1.17	70	0.41	0.17	7.00	<0.001*
Hoarseness of voice	6	1.83	0.50	1.33	73	0.52	0.21	6.33	<0.001*
Enlargement of lymph nodes	14	1.86	0.29	1.57	85	0.51	0.14	11.45	<0.001*

*Highly significant. *n*: Number of patients, BT: Before treatment, AT: After treatment, SD: Standard deviation, SE: Standard error

Table 6: Effect of therapy on associated symptoms in Group B

Signs and symptoms	*n*	Mean score			Percentage relief	SD±	SE±	*t*	*P*
		BT	AT	X					
Raaga	12	1.92	0.17	1.75	91.30	0.45	0.13	13.40	<0.001*
Aruchi	8	2.25	0.38	1.88	83.33	0.83	0.30	6.36	<0.001*
Dysphagia	10	2.20	0.30	1.90	86.36	0.57	0.18	10.59	<0.001*
Sore throat	8	2.63	0.63	2.0	76.19	0.76	0.27	7.48	<0.001*
Halitosis	6	1.67	0.33	1.33	80	0.52	0.21	6.33	<0.001*
Hoarseness of voice	7	2.14	0.43	1.71	80	0.76	0.29	6.0	<0.001*
Enlargement of lymph nodes	12	1.83	0.33	1.50	81.82	0.52	0.15	9.95	<0.001*

*Highly significant. *n*: Number of patients, BT: Before treatment, AT: After treatment, SD: Standard deviation, SE: Standard error

increase by 0.58% and 3.31% was observed in Group A and Group B, respectively. In lymphocyte count, statistically insignificant ($P > 0.05$) increase by 2.33% was observed in Group A and statistically insignificant ($P > 0.05$) decrease by 4.24% was observed in Group B. In eosinophil count, statistically insignificant ($P > 0.05$) decrease by 23.08% was observed in Group A and statistically insignificant ($P > 0.05$) increase by 3.39% was observed in Group B. In monocyte count, no change was observed in Group A and statistically insignificant ($P > 0.05$) decrease by 8.57% was observed in Group B. In ESR, statistically insignificant ($P > 0.05$) increase by 26.04% was observed in Group A and statistically insignificant ($P > 0.05$) decrease by 2.90% was observed in Group B. In absolute eosinophil count, statistically insignificant ($P > 0.05$) decrease by 23.58% was observed in Group A and statistically insignificant ($P > 0.05$) increase by 12.90% was observed in Group B [Tables 7 and 8].

On microbiological parameters

There was statistically insignificant ($P > 0.05$) reduction (17.86%) in Gram-positive cocci observed in Group A and statistically insignificant ($P > 0.05$) reduction (44.83%) observed in Group B. There was statistically insignificant ($P > 0.05$) reduction (13.33%) in Gram-negative rods observed in Group A and statistically insignificant ($P > 0.05$) reduction (25.81%) observed in Group B. There was statistically insignificant ($P > 0.05$) reduction (50%) observed in fungal filaments in both the groups. There was statistically insignificant ($P > 0.05$) reduction (66.67%) in fungal hyphae in both the groups [Tables 9 and 10].

Overall effect of the therapy

In Group A, 21.43% of patients had complete remission, 42.86% of patients had marked improvement and 35.71% of patients had moderate improvement. In Group B, 25% of patients had complete remission, 58.33% of patients had marked improvement and 16.67% of patients had moderate improvement [Figure 1].

Discussion

In the present study, majority of the patients were from the age group of 7–10 years. As the lymphoid tissue of Waldeyer's ring is most immunologically active between 4 and 10 years of age with a decrease after puberty may be the reason behind the recurrent infection of tonsils in children. 67.74% had primary school education. It shows that this age group is more susceptible to tonsillitis.[4] Children are also more exposed to crowd at school and this increases the chance of spread of infection. There is natural dominancy of *Kapha Dosha* in childhood[5] and *Tundikeri* which is a *Kapha Pradhana* disease is more prone in children. In the present study, maximum patients, i.e. 87.10%, belonged to middle class. Financial condition does not directly produce

Table 7: Effect of therapy on hematological parameters in Group A

Hematological parameters	*n*	Mean score			Percentage relief	SD±	SE±	*t*	*P*
		BT	AT	X					
Hb (g/dl)	14	11.56	11.46	−0.1	−12.5	0.62	0.17	0.60	>0.05*
TLC (/cmm)	14	7742.9	8921.4	1178.6	6.48	2532	676.7	1.74	>0.05*
Neutrophil (%)	14	49.21	49.50	0.29	9.86	11.38	3.04	0.09	>0.05*
Lymphocyte (%)	14	42.86	43.86	1.00	−2.34	11.16	2.98	0.34	>0.05*
Eosinophil (%)	14	5.57	4.29	−1.29	−17.8	3.15	0.84	1.53	>0.05*
Monocyte (%)	14	2.36	2.36	0	0	0.88	0.23	0	>0.05*
ESR (mm in 1 h)	14	13.71	17.29	3.57	26.04	11.85	3.17	1.13	>0.05*
AEC (/cmm)	14	439.29	335.71	−103.6	−23.6	312.23	83.45	1.24	>0.05*

*Insignificant. *n*: Number of patients, BT: Before treatment, AT: After treatment, SD: Standard deviation, SE: Standard error, Hb: Hemoglobin, TLC: Total leukocyte count, ESR: Erythrocyte sedimentation rate, AEC: Absolute eosinophil count

Table 8: Effect of therapy on hematological parameters in Group B

Hematological parameters	*n*	Mean score			Percentage relief	SD±	SE±	*t*	*P*
		BT	AT	X					
Hb (g/dl)	12	12.01	12.22	0.21	1.73	0.99	0.29	0.73	>0.05*
TLC (/cmm)	12	8658.3	8850	191.67	2.21	2897.5	836.43	0.23	>0.05*
Neutrophil (%)	12	52.83	54.58	1.75	3.31	16.10	4.65	0.23	>0.05*
Lymphocyte (%)	12	39.33	37.67	−1.67	−4.24	12.75	3.68	0.45	>0.05*
Eosinophil (%)	12	4.92	5.08	0.17	3.39	4.65	1.34	0.12	>0.05*
Monocyte (%)	12	2.92	2.67	−0.25	−8.57	0.75	0.22	1.15	>0.05*
ESR (mm in 1 h)	12	11.50	11.17	−0.33	−2.90	9.68	2.79	0.12	>0.05*
AEC (/cmm)	12	387.50	437.50	50	12.90	410.65	118.55	0.42	>0.05*

*Insignificant. *n*: Number of patients, BT: Before treatment, AT: After treatment, SD: Standard deviation, SE: Standard error, Hb: Hemoglobin, TLC: Total leukocyte count, ESR: Erythrocyte sedimentation rate, AEC: Absolute eosinophil count

Table 9: Effect of therapy on microbiological parameters in Group A

Microbiological parameters	*n*	Mean score			Percentage relief	SD±	SE±	*t*	*P*
		BT	AT	X					
10% KOH	14	0.71	0.36	0.36	50	0.63	0.17	2.11	>0.05*
Gram-positive cocci	14	2.0	1.64	0.36	17.86	1.5	0.4	0.89	>0.05*
Gram-negative	14	2.14	1.86	0.26	13.33	1.49	0.40	0.72	>0.05*
Fungal hyphae	10	1.8	0.6	1.2	66.67	1.75	0.55	2.17	>0.05*

*Insignificant. *n*: Number of patients, BT: Before treatment, AT: After treatment, SD: Standard deviation, SE: Standard error

Table 10: Effect of therapy on microbiological parameters in Group B

Microbiological parameters	*n*	Mean score			Percentage relief	SD±	SE±	*t*	*P*
		BT	AT	X					
10% KOH	8	0.75	0.38	0.38	50	0.92	0.32	1.16	>0.05*
Gram-positive cocci	12	2.42	1.33	1.08	44.83	0.9	0.26	4.17	>0.05*
Gram-negative	12	2.58	1.92	0.67	25.81	1.16	0.33	2.0	>0.05*
Fungal hyphae	7	1.29	0.43	0.86	66.67	1.35	0.51	1.67	>0.05*

*Insignificant. *n*: Number of patients, BT: Before treatment, AT: After treatment, SD: Standard deviation, SE: Standard error

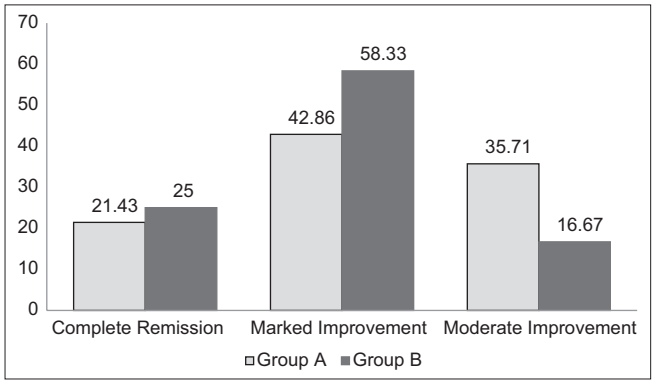

Figure 1: Overall effect of therapy

any disease, but it affects the nutritional status and immunity of the child.

Statistically highly significant ($P < 0.001$) improvement was found in all the cardinal features of the disease *Tundikeri* in both the groups, but comparative data between the group were statistically insignificant ($P > 0.05$) [Table 11]. *Toda* occurs due to *Vata Dosha* and *Kanchnara Guggulu* and *Tankana* both have *Vatahara* property. Both the drugs have *Shothahara* property and *Pratisarana* is also an *Upakrama* of *Vranashotha*.[6] Therefore, *Shotha* was subsided in both the groups. *Daha* occurs due to vitiation of *Pitta Dosha*.[7] Majority of ingredients of *Kanchnara Guggulu* have *Tikta* and *Kashaya Rasa* which pacify *Pitta Dosha*[8] and it showed better result when combined with *Pratisaraniya* drug. *Jwara* was relieved in 100% of patients in both the groups. It may be due to *Dipana* and *Pachana* properties of both the drugs which correct *Mandagni*, thereby increasing the digestive power and removes the *Ama* condition present in *Jwara*.[9]

Statistically highly significant ($P > 0.001$) improvement was observed in all the associated symptoms in both the groups.

Table 11: Comparative effect of Group A and Group B on chief complaints

Symptoms	df	Percentage of relief		Mean difference	*t*	*P*
		Group A	Group B			
Toda	24	87.88	90	0.18	0.83	>0.05*
Shotha	24	70.59	77.14	0.54	2.00	>0.05*
Daha	10	81.82	90	0	0	>0.05*
Jwara	-	100	100	-	-	-

*Insignificant. df: Degree of freedom

Raaga is the feature of inflammation which occurs due to vitiation of *Pitta* and *Rakta*. Both the formulations have *Shothahara, Pittahara,* and *Rakta Shodhana* properties, hence reduction in *Raaga* was observed. *Aruchi* is produced by *Mandagni* and intervention has *Dipana* and *Pachana* properties which correct *Mandagni* and helps to correct *Aruchi.* Dysphagia occurs in *Tundikeri* due to the inflammation and enlargement of tonsils. *Kanchnara Guggulu* has *Shothahara* property which results in relieving dysphagia. Better result was found in Group B due to the effect of *Pratisarana* drugs which showed better result in relieving *Shotha* and reduces dysphagia. As *Kanchnara Guggulu* is mentioned for the treatment for *Granthi, Apachi,* and *Gandamala*, it may have effect on lymph glands and this was the reason for the reduction in enlargement of lymph nodes. Comparative data of all the associated symptoms were statistically insignificant ($P > 0.05$) [Table 12].

In all the laboratory parameters, effect of both the groups was statistically insignificant ($P > 0.05$) and comparative data were also statistically insignificant ($P > 0.05$) [Table 13 and 14].

Probable mode of action of drugs

The mode of action of any Ayurvedic drug is based on *Samprapti Vighatana* of that particular disease. *Samprapti Vighatana* is also said to be the line of treatment. To understand

Table 12: Comparative effect of Group A and Group B on associated symptoms

Symptoms	df	Percentage of relief		Mean difference	*t*	*P*
		Group A	Group B			
Raaga	24	84.62	91.30	−0.18	0.93	>0.05*
Aruchi	15	84.21	83.33	−0.76	0.31	>0.05*
Dysphagia	21	77	86.36	0.36	1.59	>0.05*
Sore throat	17	71	76.19	0.182	0.47	>0.05*
Halitosis	12	70	80	0.833	2.43	>0.05*
Hoarseness of voice	11	73	80	0.381	1.04	>0.05*
Enlargement of lymph node	24	85	81.82	−0.071	0.35	>0.05*

*Insignificant. df: Degree of freedom

Table 13: Comparative effect of therapy on hematological parameters

Laboratory investigation	df	Percentage of relief		Mean difference	*t*	*P*
		Group A	Group B			
Hb	24	−0.99	1.73	0.323	1.02	>0.05*
TLC	24	15.22	2.21	−986.33	0.93	>0.05*
Neutrophil	24	0.58	3.31	1.464	0.27	>0.05*
Lymphocyte	24	2.33	−4.24	−2.667	0.57	>0.05*
Eosinophil	24	−23.08	3.39	1.452	0.94	>0.05*
Monocyte	24	0	−8.57	−0.25	0.77	>0.05*
ESR	24	26.04	−2.90	−3.905	0.91	>0.05*
AEC	24	−23.58	12.90	153.57	1.08	>0.05*

*Insignificant. df: Degree of freedom, Hb: Hemoglobin, TLC: Total leucocyte count, ESR: Erythrocyte sedimentation rate, AEC: Absolute eosinophil count

Table 14: Comparative effect of therapy on microbiological parameters

Microbiological parameters	df	Percentage of relief		Mean difference	*t*	*P*
		Group A	Group B			
10% KOH	17	50	50	−0.08	0.22	>0.05*
Gram-positive cocci	24	17.86	44.83	0.73	1.46	>0.05*
Gram-negative	24	13.33	25.81	0.38	0.72	>0.05*
Fungal hyphae	15	66.67	66.67	−0.34	0.43	>0.05*

*Insignificant. df: Degree of freedom

the mode of action of drug, we have to think upon *Samprapti Ghataka* and how drug breaks the chain of that *Samprapti*. Ayurvedic pharmacodynamics and pharmacokinetics are based on the principle of *Rasa-Panchaka*, i.e. *Rasa, Guna, Virya, Vipaka* and *Prabhava*. According to these parameters, probable mode of action of *Kanchnara Guggulu* is discussed below.

Majority of the ingredients of *Kanchnara Guggulu* have *Tikta, Kashaya, Madhura Rasa*; *Ushna Virya*; *Katu Vipaka*; *Laghu, Ruksha, Ushna, Tikshna Gunas* and *Tridoshahara* and *Shothahara* property. Due to *Tikta, Kashaya Rasa, Laghu* and *Ruksha Guna, Kanchnara Guggulu* subsides the aggravated *Kapha Dosha*.[10] Due to *Ushna Virya*, it subsides *Vata* and *Kapha Dosha*. *Pitta Dosha* is subsided by the *Tikta, Kashaya*, and *Madhura Rasa* properties of the drug. Due to its *Ushna Virya* and *Laghu, Ruksha Guna*, it stimulates the *Agni* and due to its *Ushna, Tikshna, Laghu Guna* and *Ushna Virya*, it removes *Srotorodha* and vitiation of *Rakta Dhatu* is normalized by *Tikta*, *Kashaya* and *Madhura Rasa* properties of the drugs. *Tundikeri* occurs due to vitiation of *Kapha* and *Rakta* and due to above properties, *Kanchnara Guggulu* decreases the vitiated *Kapha* and *Rakta* and hence, it is effective in reducing the signs and symptoms of *Tundikeri* and inflammation of tonsils.

Probable mode of action of *Tankana-Madhu Pratisarana*

Ayurveda explains that *Rasa* acts when it comes to contact with mouth, *Vipaka* acts after digestion and *Virya* acts at both level internally and externally. Hence, for the mode of action of *Pratisarana* drug, we have to rely on *Rasa* and *Virya* of drug. *Tankana* has *Katu Rasa*, *Ushna Virya* and *Ruksha*, *Tikshna Guna*. *Madhu* has *Madhura, Kashaya Rasa*, *Laghu, Ruksha Guna, Shita Virya* and *Madhura Vipaka*. *Madhu* also has *Yogavahi* property which acts as a *Sahapana* of *Tankana*. *Tankana* has *Kaphahara* property.[11] Due to *Katu Rasa*, *Ushna Virya* and *Ruksha*, *Tikshna Guna* and due to *Ushna Virya,* it also subsides aggravated *Vata Dosha*.[12] It also stimulates *Dhatvagni* when applied locally. Due to its *Ushna Virya* and *Ruksha, Tikshna Guna,* it opens the microchannels and removes the *Srotorodha*. Due to the *Lekhana* property, it corrodes the hypertrophied muscle tissue. Due to its *Ruksha Guna,* it has *Kledahara* property.[13] Due to its *Katu Rasa,* it causes "*Shonita Sanghatam Bhinatti*"[14] (clears the obstruction in *Raktavaha Srotas*).

Conclusion

Tonsillitis shows close similarity with *Tundikeri*. Both the groups showed highly significant results in all cardinal and associated features of *Tundikeri*. However, both the groups showed insignificant effect in laboratory parameters. Hence, *Kanchnara Guggulu* and *Tankana-Madhu Pratisarana* are safe and effective modality for the treatment of *Tundikeri*.

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Conflicts of interest

There are no conflicts of interest.

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हिन्दी सारांश

कांचनार गुग्गुलु तथा टंकण मधु प्रतिसारण का बच्चो के तुंडिकेरी (गिलायु शोथ) के चिकित्सीय प्रयोग का अध्ययन

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गिलायु शोथ यह बालकों की सामान्य व्याधि है। भारत में प्रतिवर्ष कुल ७५,५५,४९४ व्यक्ति गिलायु शोथ से पीड़ित होते है। गिलायु शोथ की तुलना आयुर्वेद के तुंडिकेरी से की जा सकती है। प्रस्तुत अध्ययन में कांचनार गुग्गुलु तथा टंकण मधु प्रतिसारण के प्रभाव का मूल्यांकन किया गया जिसमें अध्ययन के लिए कौमारभृत्य तथा शालाक्य तंत्र के बहिरंग विभाग से ५-१६ वर्ष के कुल ३९ रोगियों का चयन किया गया। जिन्हे दो 'समूहों ए तथा बी' में वर्गीकृत किया गया । जिनमें कुल ३९ में से २६ रोगियों ने चिकित्सा पूर्ण की।' समूह ए' में कांचनार गुग्गुलु वटी मुख द्वारा सुखोष्ण जल से दी गई एवं समूह बी में कांचनार गुग्गुलु वटी मुख द्वारा टंकण मधु प्रतिसारण के साथ दी गई । परिणामों के अनुसार 'समूह ए' में २९.४३ % रोगियों को पूर्ण राहत, ४२.८६ % रोगियों को मध्यम राहत तथा ३५.७९ % रोगियों को अल्प राहत मिली। 'समूह बी' में २५ % रोगियों को पूर्ण राहत, ५८.३३ % रोगियों को माध्यम राहत, १६.६७ % रोगियों को अल्प राहत मिली। इस प्रकार यह निष्कर्ष निकलता है कि दोनों समूहों में तुंडिकेरी के प्रत्यात्म लक्षणों में महत्वपूर्ण सुधार मिले, जिससे यह स्पष्ट होता है कि कांचनार गुग्गुल् तथा टंकण मधु