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Research Article

A COMPARATIVE CLINICAL STUDY OF *MRIDWEEKADI CHURNA* AND *YAVAGRAJADI VATI* IN *TUNDIKERI* (TONSILLITIS) IN CHILDREN

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ABSTRACT

Tonsillitis is one of the common diseases in pediatric age group. In Ayurveda it can be correlated with *Tundikeri*, Which has been described under the *Mukharoga*. Description of Mridweekadi Churna is mentioned in Charaka Samhita in Trimarmiya Aadhyay under Mukha Rogas Chikitsa, and description of Yavagrajadi Vati is mentioned in Yoga Ratnakar in Mukha Roga Chikitsa Aadhyay. According to Acharya Vagbhata the main Dosha involved in Tundikeri is Kapha Dosha. Majority of ingredients of Mridweekadi Churna and Yavagrajadi Vati have Tikta, Kashaya, Laghu, Ruksha Guna, due to this it subsides Kapha Dosha. Therefore, a study was planned to compare the effect of both drug in *Tundikeri* (tonsillitis). Methods: Children, aged 5 to 16 years, suffering from tonsillitis were registered and categorized under two groups: group- A and group-B. Group A- Patients were treated with Mridweekadi Churna, and Group B- Patients were treated with Yavagrajadi Vati for 10 days and 7 days follow up also done by drug free period. **Results:** In Group-A, 55% patients were moderately improved and 45% patients showed mild improvements. In Group-B, 15% patients showed marked improvement, 75% patients were moderately improved and 10% patients showed mild improvement. Conclusion: Tonsillitis is an inflammation of the tonsils and it is a common childhood illness. During childhood period there is a natural dominancy of Kapha dosha and Tundikeri- a Kapha Pradhana disease (according to Acharya Vagbhata), hence children are more prone to it. To treat this, drugs should have the Kaphahar properties like Tikta, Kashaya ras and Laghu, Ruksha Guna. In this comparative clinical study both the chosen drugs, Mridweekadi Churna and Yavaqrajadi Vati possesses all these properties and also are markedly effective in *Tundikeri*, but group B *Yavagrajadi Vati* display better results than Mridweekadi Churna. This study will also help future researchers to evaluate further in this research work.

INTRODUCTION

Children are vulnerable to malnutrition and infectious disease. Tonsillitis is one of the most prevalent infectious diseases in pediatric age group. It is amongst the recurrent infections of upper respiratory tract.



Globally more than 1.5 million deaths annually from respiratory infections are attributable to the environment, including at least 42% of lower respiratory infections and 24% of upper respiratory infections in developing countries^[1]. Any Infection in a child may impact growth and development and hamper immunity. Tonsils are the part of the immune system and work as a first line of defense at the Oropharyngeal gateway. Therefore, they are called as the 'Police man of GI tract.' When these tonsils get inflamed due to bacteria and virus it is called tonsillitis. It commonly occur now-a-day due to the dietary factor (taking spicy food, cold beverage), climatic factor (cold climate) and due to lower socioeconomic factor (low

immunity status). These factors grouped together result in recurrent episode of the disease.

In modern medicine tonsillitis is often treated by antibiotics. Surgery is performed when child stops responding to medicine and in obligatory conditions. The most frequent surgeries performed on children in ENT practice is Tonsillectomy.

In Ayurveda clinical presentation of *Tundikeri* is more like tonsillitis. It is a described under *Mukha Roga*. Acharya Charaka described four types of *Mukharoga* on the basis of predominance of *Doshas*^[2]. *Acharya Sushruta* described it under *Talu gatarog*^[3] and *Acharya Vagbhatta* under *Kantha gataroga*^[4]. According to *Acharya Sushruta Tundikeri* is manifested as a swelling in *Talu* associated with burning sensation and suppuration and according to *Acharya Vagbhatta* it is a swelling of *Hanusandhi Pradesha* resembling *Vanakarpasa Phala* (cotton fruit).

Dealing with the treatment of *Tundikeri Acharya Charaka* has described medicinal treatment of *Mukha roga*. *Acharya Sushruta* classified it under *Bhedya Roga* and mentions that it should be treated as per the lines of treatment of the disease *Galashundika*, followed by the local application of drugs having properties like *Lekhana*, *Shothahara*, *Sandhaniya*, *Ropana*, *Rakta Stambhana* and *Vedanasthapana*^[5]. *Acharya Vagbhata* mentions treatment of *Tundikeri* as per the lines of treatment of the disease *Kaphaj Rohini*^[6]. Tonsillitis is a commonly occurs infectious diseases in pediatric age group and exerts untoward effect on the entire growth, development, and psychology of the children.

Description of Mridweekadi Churna is mentioned in *Charaka Samhita* in *Trimarmiya Aadhyay* under Mukha Rogas Chikitsa[7], and description of Yavagrajadi Vati is mentioned in Yoga Ratnakar in Mukha Roga Chikitsa Aadhvay^[8]. According to Acharva Vagbhata the main Dosha involved in Tundikeriis Kapha Dosha. Majority of ingredients of Mridweekadi Churna and Yavagrajadi Vati have Tikta, Kashaya, Laghu, Ruksha Guna due to this it subsides Kapha Dosha. Also, majority of ingredients possess Shothahara. Vedanahara. Rasavana, Jwarghna, Aamapachana and Kasaghna properties.

AIM

To compare the efficacy of Mridweekadi Churna and Yavagrajadi Vati in Tundikeri.

OBJECTIVES

The objective of the study is-

- 1. To determine the efficacy of *Mridweekadi Churna* on graded subjective parameters of *Tundikeri*.
- 2. To determine the efficacy of *Yavagrajadi Vati* on graded subjective parameters of *Tundikeri*.

Plan of Study

Total 40 patients were selected for the study. The cases registered for the study were divided into two groups named as group A and group B, both the groups comprising of 20 children. Following are the details of the study.

Inclusion Criteria

- 1. Children belonging to the age group of 5 to 16 years.
- 2. Children diagnosed with acute tonsillitis.

Exclusion Criteria

- 1. Children below 5 years and above 16 years were excluded.
- 2. Children having chronic tonsillitis were excluded.
- 3. Children having other systemic disorder with tonsillitis were excluded.

Discontinuation Criteria

- 1. ADR
- 2. Patients not willing to continue
- 3. Appearance of any severe complication.
- 4. Any other severe acute illness

Type of Study - Open label

Duration of Study- 10 days

Observation period

The child was assessed clinically on 1st, 4th, 7th, and 10th day during the treatment and follow up after 7 days.

Study Design

Selection of drug

- 1. Group A- Patients were treated with *Mridweekadi Churna*.
- 2. Group B- Patients were treated with *Yavagrajadi Vati*.

Table 1 and 2 shows the contents of *Mridweekadi Churna* and *Yavagrajadi Vati* respectively. The details of the drug dose are given in table 3.

Table 1: Contents of Mridweekadi Churna

S.No.	Content	Botanical Name	Family	Ras	Guna	Virya	Vipaka
1	Mridweeka	Vitis vinifera Linn.	Vitaceae	Madhur	Snigdha, Guru, Mridu	Sheeta	Madhur
2	Katuka	Picrorthizakurroa Royal ex Benth	Scrophulariaceae	Tikta	Laghu, Ruksha	Sheeta	Katu
3	Shunthi	Zingiber officinale	Zingiberaceae	Katu	Laghu,	Ushna	Madhur

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		Rose.			Snigdha		
4	Pippali	Pipper logum Linn.	Piperaceae	Katu	Laghu, Snigdha, Teekshana	Anushana Sheeta	Madhur
5	Marich	Pipper nigrum Linn.	Piperaceae	Katu	Laghu, Ruksha	Ushna	Katu
6	Darvitwak	Berberis aristata DC	Berberidaceae	Tikta, Kashaya	Laghu, Ruksha	Ushna	Katu
7	Amalaki	Emblica officinalis Gaertn.	Euphorbiaceae	Pancheas	Guru, Ruksha	Sheeta	Madhur
8	Haritaki	Terminalia chebula Retz.	Combreraceae	Panchras	Laghu, Ruksha	Ushna	Madhur
9	Vibhitak	Terminalia belliricaRoxb.	Combreraceae	Kashaya	Laghu, Ruksha	Ushna	Madhur
10	Nagarmotha	Cyperus rotundus Linn.	Cyperaceae	Tikta, Katu, Kashaya	Laghu, Ruksha	Sheeta	Katu



Table 2: Contents of Yavagrajadi Vati

S.No	Content	Botanical	Family	Ras	Guna	Virya	Vipaka
		Name					
1	Yavagrajam (Yavakshar)	Hordeum vulgare Linn.	Poaceae	Kashay, Madhur (ch.)	Rukshana, Aguru (ch.)	Sheeta	Katu
				Kashay, Madhur (su.)	Ruksha, Pichhila (su.) Ruksha,	Sheeta	Katu
				Madhur (vag.)	Guru, Sara (vag.)	Sheeta	Katu
2	Tejvati	Zanthoxylum armatum DC.	Rutaceae	Katu, Tikta	Laghu, Ruksha, Teekshana	Ushna	Katu
3	Patha	Cissampelos pareira Linn.	Menispermace ae	Tikta	Laghhu, Teekshana	Ushna	Katu
4	Rasanjam	Berberis aristata DC.	Berberidaceae	Tikta, Kashaya	Laghu, Ruksha	Ushna	Katu
5	Darunisha	Berberis aristata DC.	Berberidaceae	Tikta, Kashaya	Laghu, Ruksha	Ushna	Katu
6	Krishna	<i>Pipper logum</i> Linn.	Piperaceae	Katu	Laghu, Snigdha, Teekshana	Anushana Sheeta	Madhur



Yavakshar



Tejvati



Patha



Daruharidra



*Pippali*Table 3: Drug Dose



Rasanjan

Group	Group A (Mridweekadi Churna (Vati))	Group B (Yavagrajadi Vati)	
Dose 05-08 years (1 TDS)		05-08 years (1/2 TDS)	
	09-12 years (2 TDS)	09-12 years (1 TDS)	
	13-16 years (3 TDS)	13-16 years (3 TDS)	
Route	Oral	Oral	
Duration	10 Days	10 Days	

No. of Patients - 40

Formulation of drug - In Vati form

Criteria for Assessment

The assessment of the trial was done based on subjective and objective parameters. The subjective parameters include the clinical features of *Tundikeri* (tonsillitis) as describe in Ayurvedic and modern texts, which are (1) *Toda* (pain), (2) *Galoparodha* (dysphagia) and (3) *Asyavairasya* (alter taste of mouth). Whereas the objective parameters include (1) *Kathina sotha* (enlargement of tonsils), (2) *Ragatwa* (redness), (3) *Mukha daurgandhya* (halitosis) and (4) *Jwara* (fever).

The grading of various clinical features is as follow:

Toda (Pain)

No pain	0
Mild tenderness on pressing	1
Pain during deglutition	2
Pain during rest	3

Galoparodha (Dysphagia)

No difficulty	0
Difficulty in taking solid food only	1
Difficulty in taking solid and liquid food	2
Difficulty in swallowing saliva	3

Asyavairasya (Alter taste of mouth)

Normal taste in food, feeling to eat food in time		
Aruchi- Feeling to take food but not having taste		
Anannabhilasha- Not feeling to take food even if hungry		
Bhktadvesha- Aversion to food	3	

Kathina sotha (Enlargement of tonsils)

Tonsils are located within the tonsillar fossa	0
Tonsils hypertrophy till the brim of the tonsillar fossa	1
Tonsil hypertrophy extends beyond the pillars but not touching each other	2
Tonsils are in contact with each other	3

Ragatwa (Redness)

No erythema	0
Light red	1
Moderate red	
Bright red	3

Mukha daurgandhya (Halitosis)

No halitosis	0
Present only when mouth is open completely	1
Present during yawning	2
Present even during talking	3

Jwara (Fever)

Normal temperature	0
98.6°F -100°F	1
100°F -102°F	2
>102°F	3

Investigation: Hb%, TLC, DLC, ESR

Statistical Analysis: Statistical calculation was done by the SIGMA STAT software and GRAPH PAD software.

Wilcoxon Signed Ranked Test, Mann Whitney Rank Sum Test, Paired t test, Unpaired t Test was applied.

OBSERVATION

Table 4: Age wise distribution of group A and group B

Age	Group A	Group B	Total	Percentage
5-8 years	9	10	19	47.5%
9-12 years	2	8	10	25%
13-15 years	9	2	11	27.5%

Table 5: Sex wise distribution of group A and group B

Sex	Group A	Group B	Total	Percentage
Male	13	11	24	60%
Female	7	9	16	40%

Table 6: Socioeconomic wise distribution of group A and group B

Socioeconomic status	Group A	Group B	Total	Percentage
Lower	7	7	14	35%
Middle	13	13	26	65%
Higher	0	0	0	0%

Table 7: Sign and symptoms wise distribution of group A and group B

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Sign and symptoms	Group A	Group B	Total	Percentage	
Toda	20	20	40	100%	
Galoparodha	20	20	40	100%	
Asyavairasya	19	19	38	95%	
Katina Sotha	20	20	40	100%	
Ragawta	20	APR 20°	40	100%	
Mukha daurgandhya	19	18	37	92.5%	
Jwara	13	14	27	67.5%	

RESULTS

Table 8: Efficacy study of Group-A on Subjective Parameters

Group-A	N	Median		Wilcoxon	P-	%	Result
		BT	AT	Signed Rank W	Value	Effect	
Toda	20	2	1	-4.099a	0.000	55.32	Significant
Galoparodha	20	2.5	1.5	-3.176a	0.001	34.04	Significant
Asyavairasya	19	2	1	-3.666a	0.000	58.34	Significant

Table 9: Efficacy study of Group-B on subjective parameters

Group-A	N	Median		Wilcoxon	P-	%	Result
		BT	AT	Signed Rank W	Value	Effect	
Toda	20	3	1	-4.042a	0.000	66.67	Significant
Galoparodha	20	2	1	-3.542a	0.000	45.45	Significant
Asyavairasya	19	2	1	-3.938a	0.000	71.66	Significant

Table 10: Intergroup comparison of subjective parameters

Subjective Parameters	Group	N	Mean Rank	Sum of Ranks	Mann Whitney U	P-Value	Results
Toda	Group A	20	16.85	337.00			
	Group B	20	24.15	483.00	127.000	0.024	Significant
	Total	40					
	Group A	20	19.00	380.00			
Galoparodha	Group B	20	22.00	440.00	170.000	0.038	Significant
	Total	40					
	Group A	19	17.00	323.000			
Asyavairasya	Group B	19	22.00	418.000	133.000	0.095	Non- Significant
	Total	38					

Table 11: Efficacy study of Group-A on objective parameters

Group-A	N	Median		Wilcoxon	P-	%	Result
		BT	AT	Signed Rank W	Value	Value Effect	
Kathina sotha	20	3	2	-3.419a	0.001	30.00	Significant
Mukha daurgandhya	19	2	1	-4.184a	0.000	55.01	Significant
Ragatwa	20	2	1	-4.053a	0.000	68.29	Significant
Jwara	13	1	0	-3.464a	0.001	70.59	Significant

Table 12: Efficacy study of Group-B on objective parameters

Group-B	N	Median		Wilcoxon	P-	%	Result
		BT	AT	Signed Rank W	Value	Effect	
Kathina sotha	20	2	1	-4.053a	0.000	69.57	Significant
Mukha daurgandhya	18	2	1	-3.729a	0.000	68.42	Significant
Ragatwa	20	2	1	-3.720a	0.000	74.58	Significant
Jwara	14	1	0	-3.419a	0.001	60.00	Significant

Table 13: Intergroup comparison of objective parameters

Objective Parameters	Group	N	Mean Rank	Sum of Ranks	Mann Whitney U	P-Value	Results
	Group A	20	14.10	282.00			
Kathina sotha	Group B	20	26.90	538.00	72.000	0.000	Significant
	Total	40					
Mukha daurgandhya	Group A	19	26.13	306.50			
	Group B	18	22.02	396.00	116.500	0.0454	Non-
	Total	37					Significant
	Group A	20	19.00	380.00			
Ragatwa	Group B	20	22.00	440.00	170.000	0.034	Significant
	Total	40					
	Group A	13	13.03	169.50			Non-
Jwara	Group B	14	14.89	208.50	78.500	0.0345	Significant
	Total	27					

Table 14: Efficacy study of Group-A on biochemical parameters

Biological Parameter	M	ean	N	SD	SE	t-Value	P-Value	Result
ECD	BT	20.90	20	11.41	2.55	3.501	0.002	Significant
ESR	AT	17.45	20	10.53	2.35			
НВ%	BT	11.34	20	1.18	0.26	-1.962	0.065	Non-
	AT	11.45	20	1.23	0.27			Significant
TLC	BT	8470.00	20	711.63	159.13	4.774	0.000	Non-
	AT	8240.00	20	645.96	144.44			Significant
Del marke	ВТ	71.25	20	3.06	0.68	1.506	0.148	Significant
Polymorphs	AT	70.45	20	3.91	0.88			
Lymphogytog	ВТ	25.20	20	3.93	0.88	1.165	0.258	Significant
Lymphocytes	AT	24.80	20	3.41	0.76			
Easinanhila	BT	3.55	20	0.94	0.21	2.651	0.016	Significant
Eosinophils	AT	3.10	20	1.17	0.26			
	ВТ	1.00	20	0.00	0.00	-1.831	0.083	Non-
Monocytes	AT	1.15	20	0.37	0.08			Significant

Table 15: Efficacy study of Group-B on biochemical parameters

Biological Parameter	ľ	Mean	N	SD	SE	t-Value	P-Value	Result
ESR	BT	16.55	20	6.64	1.49	2.402	0.027	Significant
ESK	AT	13.90	20	5.12	1.14			
HB%	ВТ	11.53	2 0	1.53	0.34	-1.058	0.303	Non-
	AT	11.65	20	1.41	0.31			Significant
TLC	BT	7460.00	20	685.49	153.28	1.766	0.093	Non-
	AT	7270.00	20	1005.30	224.79			Significant
D 1 1	BT	68.85	20	2.06	0.46	3.359	0.003	Significant
Polymorphs	AT	66.30	20	4.09	0.92			
Lymphogytog	ВТ	25.90	20	2.99	0.67	5.434	0.000	Significant
Lymphocytes	AT	22.30	20	3.67	0.82			
Eaginaphila	BT	3.25	20	1.21	0.27	3.240	0.004	Significant
Eosinophils	AT	2.70	20	1.22	0.27			
	ВТ	0.90	20	0.64	0.14	-0.809	0.428	Non-
Monocytes	AT	1.00	20	0.65	0.15			Significant

Table 16: Intergroup comparison of biochemical parameters

Table 10. Intergroup comparison of biochemical parameters													
Biological Parameters	Group	N	Mean	SD	SE	t-Value	P-Value	Result					
ESR	Group A	20	4.15	3.72	0.83	-0.367	0.716	Non-					
	Group B	20	4.55	3.15	0.71			Significant					
HB%	Group A	20	0.12	0.26	0.06	-1.897	0.065	Non-					
	Group B	20	0.32	0.41	0.09			Significant					
TLC	Group A	20	240.00	203.65	45.54	-2.491	0.017	Significant					
	Group B	20	430.00	273.57	61.17								
Polymorphs	Group A	20	1.70	1.81	0.40	-2.859	0.007	Significant					
	Group B	20	3.55	2.26	0.51								

Lymphocytes	Group A	20	1.20	1.01	0.22	-4.432	0.000	Significant
	Group B	20	3.90	2.53	0.57			
Eosinophils	Group A	20	0.75	0.44	0.10	0.000	1.000	Non-
	Group B	20	0.75	0.55	0.12			Significant
Monocytes	Group A	20	0.15	0.37	0.08	-1.125	0.267	Non- Significant

Table 17: Comparative assessment of % relief on various symptoms

Symptoms	% Relief in group A	% Relief in group B		
Toda	55.32	66.67		
Galoparodha	34.04	45.45		
Asyavairasya	58.34	71.66		
Kathina sotha	30.00	69.57		
Mukha daurgandhya	55.01	68.42		
Ragatwa	68.29	74.58		
Jwara	70.59	60.00		

Table 18: Overall response in each Group

Improvement %	Group A		Group B		Total	
	N	P	N	P	N	P
Markedly improvement (75-100%)	0 of A	10 veda	3	15	3	7.5
Moderately improvement (50-74%)	11	55	12	75	26	65
Mildly improvement (25-49%)	9	45	2	10	11	27.5
No improvement (< 25%)	0	0	03	0	0	0

DISCUSSION

- 1. The present research work was conducted on *Mridweekadi Churna* and *Yavaqrajadi Vati*.
- 2. Contents of *Mridweekadi Churna* are *Mridweeka, Katuka, Shunthi, Pippali, Marich, Darvitwak, Amalaki, Haritaki, Vibhitak* and *Nagarmotha.*
- 3. *Mridweeka* and *Pippali* have *Kanthya* property as *Acharya Charak* described *Mridweeka* and *Pippali* under *Kanthya Mahakashaya*^[9].
- 4. Darvitwak have Vishghna, Shotahara, Vedanahara, Shodana, Kasaghna, Dahaghna and Rakta prasadana properties.
- 5. *Pippali* have *Jwarghna*, *Vedanahara*, *Aamapachana*, *Kasaghna* and *Rasayana* properties.
- 6. Contents of Yavagrajadi Vati are Yavakshar, Tejvati, Patha, Rasanjan, Darunisha and Krishna.
- 7. Yavakshar have Vishghna, Shothahara and Vedanahara properties.
- 8. Patha have Jwarghna, Vedanahara and Shodhana properties.
- 9. *Tejvati* have *Jwarghna*, *Vedanahara* and *Kasaghna* properties.
- 10. These contents also have antiulcer, antifungal, antibacterial, antipyretic, antimicrobial, anti-viral, anti-inflammatory and wound healing properties.

- 11. The ingredients of Mridweekadi Churna (Vati) and Yavagrajadi Vati have Madhur, Amla, Katu, Tikta and Kashava Rasa.
- 12. As we know according to Acharya Vagbhata *Tundikeri* occurs due to vitiation of *Kapha Dosha*, due to *Tikta*, *Katu* and *Kashaya Rasa* it subsides the vitiated *Kapha Dosha*.
- 13. According to Acharya Charak property of *Madhur Rasa* are *Kanthya* (beneficial for throat), *Mukhakantha-Oshtha-jihwa prahadano*^[10] (delighting for throat, lips and tongue).
- 14. Property of *Katu Rasa* are *Mukhasodhak* (cleanses the mouth), *Swayathuuphanti*^[11] (alleviates swelling).
- 15. Property of *Tikta Rasa* is *Jwarghna*^[12] (antipyretic).
- 16. Property of *Amla Rasa* is *Bhaktamrochyati*^[13] (give rise to relish food). So from the above we can conclude that these property of *Mridweekadi Churna* and *Yavagrajadi Vati* helps in relieving the symptoms of *Tundikeri*.

CONCLUSION

The following are the conclusions drawn from the present study:

1. Tonsillitis is one of the most prevalent infectious diseases in pediatric age group.

- 2. There is a natural dominancy of *Kapha Dosha* in childhood and *Tundiker* is also a *Kapha Pradhana* disease, so children are more prone to it.
- 3. Dietary factor (taking spicy food, cold beverage), climatic factor (cold climate) and lower socioeconomic factor (low immunity status) are responsible factor for tonsillitis.
- 4. Total 40 patients were registered and the entire patients completed the full course of trial.
- 5. In Group-A, 55% patients were moderately improved and 45% patients showed mild improvements.
- 6. In Group-B, 15% patients showed marked improvement, 75% patients were moderately improved and 10% patients showed mild improvement.
- 7. Overall effect of therapy shows that, 7.5% patients showed marked improvement, 65% patients were moderately improved and 27.5% patients showed mild improvement.
- 8. Intergroup comparison showed non-significant result in *Asyavairasya, Mukha daurgandhya and Jwara* and significant results in *Toda* and *Galoparodha, Kathina sotha* and *Ragatwa*
- 9. On comparative assessment, maximum percentage of relief was seen in Group-B in all symptoms except *Jwara*.
- 10. Between both groups, Group B (Yavagrajadi Vati) displayed better results when compared with *Mridweekadi Churna*.

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