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A Comprehensive Study on the Efficacy of Tonsenorm Compound in The Management of Tonsillitis

Dr.Ashok Kumar Pushkar[1], Dr. Rakesh Kumar Nagar[2], Dr. Prabhakar Vardhan[3], Dr. Savita Pushkar[4]

[1]MD Scholar, Department of Kaumarbhritya, National Institute of Ayurveda, Deemed to be University (De-novo), Jaipur, Rajasthan

[2]Associate Professor, Department of Kaumarbhritya, National Institute of Ayurveda, Deemed to be university (De-novo), Jaipur, Rajasthan

[3]Associate Professor, Department of Shalakya Tantra, National Institute of Ayurveda, Deemed to be university (De-novo), Jaipur, Rajasthan

[4]MS Scholar, Department of Shalakya Tantra, National Institute of Ayurveda, Deemed to be university (De-novo), Jaipur, Rajasthan

Corresponding Author: Dr. Ashok Kumar Pushkar
MD Scholar, Room no.224, Department of Kaumarbhritya, National Institute of Ayurveda, Amer Road, Jaipur, Pin code 302002

ABSTRACT

Introduction: Tonsillitis, an inflammation of the tonsils, is commonly caused by viral or bacterial infections, leading to symptoms such as swelling, pain, difficulty swallowing, and congestion. Traditional remedies offer potential therapeutic benefits, and this study aims to evaluate the efficacy of Tonsenorm, a compound comprising a blend of herbs and minerals, in the management of tonsillitis.

Methods: This clinical study was conducted over 90 days with diagnosed cases of tonsillitis. The treatment consisted of Tonsenorm, formulated with *Shirisha* (*Albizia lebbeck*), *Guduchi* (*Tinospora cordifolia*), *Ativisha* (*Aconitum heterophyllum*), *Shunthi* (*Zingiber officinale*), *Maricha* (*Piper nigrum*), *Pippali* (*Piper longum*), *Tankan Bhasma*, *Shuddha Gandhaka* and *Yashada Bhasma*. Objective and subjective parameters, including swelling, pain, burning sensation, congestion, difficult swallowing, and lymph node enlargement, were assessed at 60 and 90 days. Hematological and liver function tests were also performed to evaluate the systemic effects of the treatment.

Results: Significant improvements were observed in both subjective and objective parameters. Swelling decreased by 51.41% by day 60, with a further reduction to 52.63% by day 90. Pain relief was 95.80% by day 60, sustained at 92.81% by day 90. Burning sensation, congestion, and difficult swallowing improved by 93.13%, 74.32%, and 82.75%, respectively, by day 90. Lymph node swelling was reduced by 43.58%. Significant improvements were also seen in hematological markers, with a reduction in WBC count and an increase in MCH and MCHC, indicating enhanced erythropoiesis and reduced systemic inflammation. Liver function improved, with a significant decrease in SGOT levels ($p = 0.02$).

Discussion: The observed improvements in symptoms and clinical parameters can be attributed to the anti-inflammatory, analgesic, antimicrobial, and immune-modulatory properties of the herbs and minerals in

Tonsenorm. These findings align with traditional Ayurvedic principles and modern pharmacological understanding, supporting the efficacy of the compound in treating tonsillitis.
Conclusion: Tonsenorm compound proved to be an effective and holistic therapeutic option for managing tonsillitis, providing significant relief from symptoms while improving immune and inflammatory markers. The compound's multifaceted actions make it a promising treatment for tonsillitis, offering both short-term and long-term benefits.

KEYWORDS: Tonsillitis, Tonsenorm, Ayurveda treatment, *Tundikeri*, etc.

INTRODUCTION

Tonsillitis, a common inflammatory condition of the tonsils caused by bacterial (e.g., *Group A Streptococcus*) or viral infections, predominantly affects children. Conventional treatments, including antibiotics and, in severe cases, tonsillectomy, often provide symptomatic relief but may lead to recurrence or resistance concerns.[1] This necessitates exploring alternative and integrative approaches, such as Ayurvedic formulations like Tonsenorm compound.

Ayurvedic Understanding: *Tundikeri*

In Ayurveda, tonsillitis is described as *Tundikeri*, primarily caused by the vitiation of *Kapha* and *Rakta doshas*. Symptoms include swelling (*Shotha*), pricking pain (*Toda*), burning sensation (*Daha*), and inflammation (*Prapaka*), aligning with modern descriptions of the condition. The disease develops due to factors such as: Improper diet (e.g., excessive intake of *Madhura*, *Amla*, *Lavana Rasas*), Poor oral hygiene and seasonal changes.

The pathophysiology (*Samprapti*) of tonsillitis, described as *Tundikeri* in Ayurveda, highlights the progression of *doshas* from their initial accumulation to full-blown inflammation. Acharya Vagbhata identifies *Kapha* as the primary *Dosha* involved, while Acharya Sushruta emphasizes the role of both *Kapha* and *Rakta* in disease manifestation. The key *Dushyas* affected include *Rasa*, *Rakta*, and *Mamsa*, with *Jatharagni* and *Dhatvagni Mandya* contributing to the pathological process. The primary *Srotasas* impacted are *Rasavaha*, *Raktavaha*, and *Mamsavaha*, indicating widespread systemic involvement. Ayurvedic management focuses on rebalancing these *Doshas* through therapies like *Vamana* (emesis) and *Virechana* (purgation), alongside localized treatments such as medicated gargles. Preventive strategies, including dietary modifications and maintaining oral hygiene, are emphasized to minimize recurrence and ensure sustained relief.[2]

Modern perspective: Tonsillitis

Tonsillitis, from a modern medical viewpoint, is an infection of the tonsils, typically caused by viruses or bacteria, such as Group-A Streptococcus. The condition predominantly affects children and presents with sore throat, difficulty swallowing, fever, and swollen tonsils, often accompanied by pus in bacterial cases.[3]

The tonsils are part of the immune system, serving as a defense mechanism against pathogens. However, repeated infections can overwhelm their function, leading to chronic or recurrent tonsillitis. Diagnosis includes throat cultures, Rapid Antigen Detection Tests (RADT), and blood tests for specific infections like Epstein-Barr virus (EBV).

Treatment varies based on the cause: Viral tonsillitis is managed symptomatically, while Bacterial tonsillitis requires antibiotics like penicillin etc. In severe or recurrent cases, a tonsillectomy (surgical removal of the tonsils) may be indicated

Ayurveda's holistic framework complements modern treatments by addressing underlying causes, enhancing immunity, and emphasizing lifestyle changes to reduce recurrence. Conventional treatments such as antibiotics often provide symptomatic relief but are associated with recurrence and resistance issues. In this

context, Ayurvedic formulations like Tonsenorm compound, which leverage the synergistic action of traditional herbs, offer a holistic alternative that integrates immune modulation, anti-inflammatory, and antimicrobial effects. This study was designed to evaluate the efficacy of Tonsenorm compound in managing the symptoms of tonsillitis through subjective (symptom-based) parameters over 90 days and objective (biomarker-based) parameters over 60 days.

Aim & Objective of Study- To evaluate the efficacy of the Tonsenorm compound in the management of *Tundikeri* with special reference to chronic tonsillitis in children. To improve the quality of life by providing relieve in symptoms of *Tundikeri* with effective and safe treatment option.

METHODOLOGY

- **Study type** – This was an open-label, single-group interventional study conducted to assess the safety and efficacy of Tonsenorm compound in children with *Tundikeri*. The study design did not involve masking or a control group and spanned 60 days of active intervention.
- **Timing** – 60 days
- **End point** - Safety and Efficacy
- **No. of groups** – One
- **Sample size** – 40 (single group)
- **Timelines:** The total trial period extended over three months, comprising a 60-day interventional phase followed by a one-month post-treatment follow-up period. If necessary, a preparatory or washout period of four weeks was included before initiating the intervention. Follow-up evaluations were systematically conducted every 15 days, specifically on Days 15, 30, 45, 60, and 90, to monitor progress and outcomes.
- **Selection of cases-** The study recruited participants from the outpatient department (O.P.D) of the Department of Kaumarbhritya (Balroga) at the National Institute of Ayurveda, Jaipur. Children aged 5 to 10 years of either sex were considered eligible for inclusion. Initially, 48 cases were registered for the clinical trial. However, 8 participants discontinued due to irregularities, resulting in a total of 40 patients successfully completing the study.

Inclusion criteria

- Children of either sex in between age group of 05 to 10 years.
- Patients presenting with symptoms of *Tundikeri* and/or Chronic tonsillitis.
- Patients clinically having chronic tonsillitis from grade 1 to 3.

Exclusion criteria

- Patients clinically having chronic tonsillitis of grade 4.
- Patients presenting with acute pharyngotonsillitis.
- Patient with complications of Tonsillitis like peritonsillar abscess, retropharyngeal abscess, para-pharyngeal abscess etc.
- Patients on other drugs which may change the outcome of trial drug.
- Immunocompromised patients e.g., patients suffering from HIV, Tuberculosis etc.

Discontinuation Criteria:

- Parents/attendant not willing to participate or continue the treatment.
- Appearance of any other acute illness during the therapy.
- Patient develops severe complications during the course.

Assessment Criteria:

- **Subjective Parameters:** Symptoms such as pain (*Toda*), tonsillar enlargement (*Shopha*), burning sensation (*Daha*), congestion, dysphagia (difficulty in swallowing), halitosis, cough, and sore throat

were evaluated. **Objective Parameters:** Biomarker data such as hemoglobin (Hb), total WBC count, absolute lymphocyte count, monocyte count, and liver (SGOT/SGPT) and kidney function tests (serum creatinine) were analyzed.

- **Intervention**

Drug	**Tonsenorm Compound**
Vehicle	*Madhu*
Duration of trial	2 month
Drug dose	250mg TID

- **Outcome measures**
  - **Primary outcome measures-** Change in scoring/ grading of symptoms of *Tundikeri* /chronic Tonsillitis.
  - **Secondary outcome measures-** Change in scoring/ grading of size of tonsillar mass.
- **Data Documentation and Analysis-** All information regarding clinical trial was properly documented carefully handled and meticulously stored in order to ensure its accurate interpretation and verification. Observation documented during the study was analyzed and findings were evaluated by using statistical methods to establish the efficacy.
- **Statistical Analysis-** For statistical analysis in this clinical study, intra-group comparisons were performed using two different tests. The Paired t-test was applied to objective parameters to assess the significance of changes in measurable biomarkers, such as blood counts and liver and kidney function tests. For subjective parameters, such as pain, swelling, and burning sensation, the Wilcoxon matched signed-rank test was utilized. This non-parametric test was chosen to evaluate the changes in symptoms based on patient-reported outcomes, as it is particularly suitable for ordinal data or when the assumption of normality is not met. These statistical methods allowed for a comprehensive analysis of the efficacy of the Tonsenorm compound in managing *Tundikeri*/ chronic tonsillitis.

RESULT

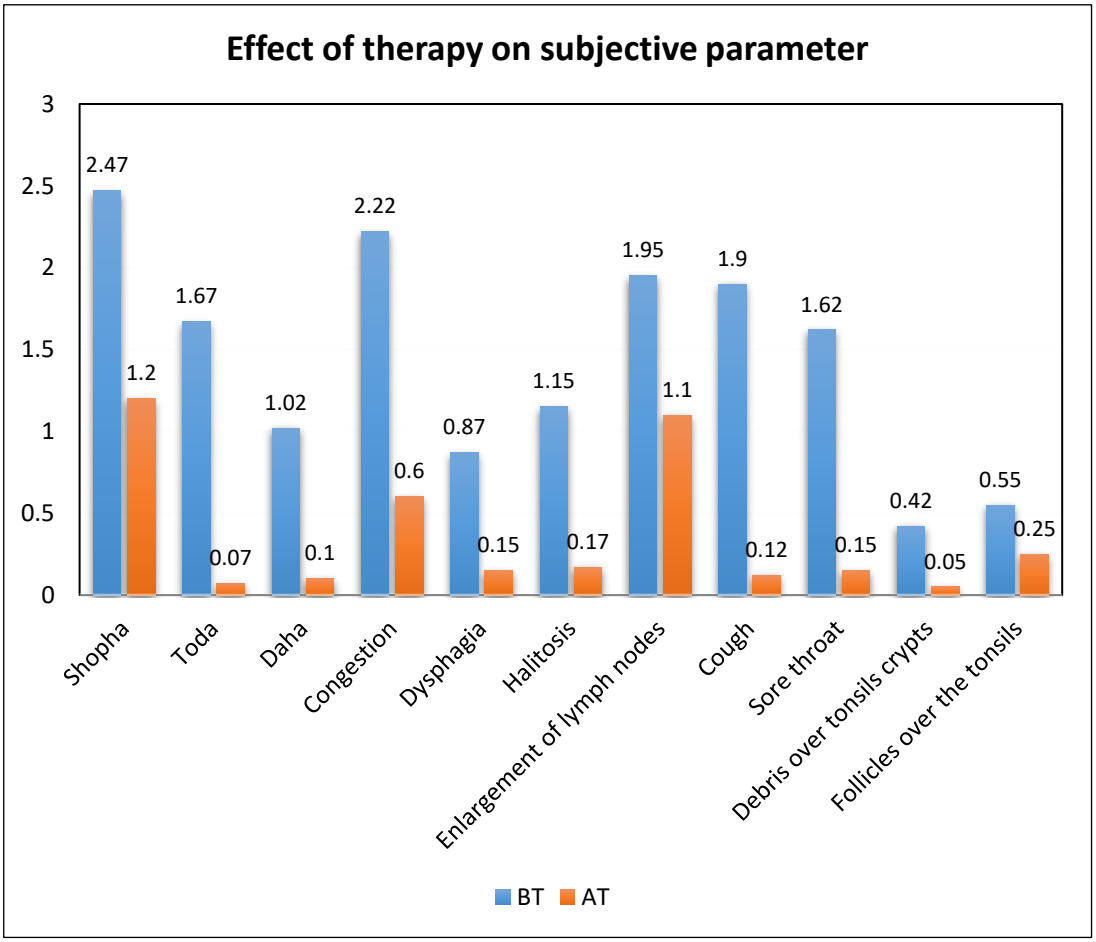
Demographic data: The study's observations and results provide an in-depth analysis of the demographic distribution, baseline health parameters, and the therapeutic impact on various clinical conditions over a 90-day treatment period. Among the 48 initially enrolled subjects, 40 completed the study, achieving an 83.33% retention rate. The majority of participants (45%) were aged 5–7 and 9–10 years, with a male predominance (70%) and a predominantly urban habitat (82.5%). Most subjects belonged to lower-middle socioeconomic status (62.5%), with 60% from nuclear families. Significant lifestyle factors included a mixed diet in 40% and altered appetite in 90%, while 32.5% consumed fast food twice weekly.

Table 1: Effect of therapy on subjective parameters using Wilcoxon matched sign rank test on day 60th (n=40)

Parameter	**BT (day 0)**	**AT (day 60)**	**Mean Diff.**	**% relief**	**SD±**	**SE±**	**W**	**P Value**	**Result**
Shopha	2.47	1.20	1.27	51.41	0.55	0.08	741	<0.001	HS
Toda	1.67	0.07	1.60	95.80	0.59	0.09	741	<0.001	HS
Daha	1.02	0.10	0.92	90.19	0.57	0.09	528	<0.001	HS
Congestion	2.22	0.60	1.62	72.97	0.49	0.07	820	<0.001	HS
Dysphagia	0.87	0.15	0.72	82.75	0.67	0.10	300	<0.001	HS

Halitosis	1.15	0.17	0.97	84.34	0.73	0.10	435	<0.001	HS
Enlargement of lymph nodes	1.95	1.10	1.85	43.58	0.92	0.14	210	<0.001	HS
Cough	1.90	0.12	1.77	93.15	0.89	0.10	703	<0.001	HS
Sore throat	1.62	0.15	1.47	90.74	0.64	0.10	703	<0.001	HS
Debris over tonsils crypts	0.42	0.05	0.37	88.09	0.54	0.08	105	<0.001	HS
Follicles over the tonsils	0.55	0.25	0.30	54.4	0.46	0.07	78	<0.001	HS

The study measured the effectiveness of a treatment on various health parameters over 60 days. Significant improvement was observed across all parameters, with high statistical significance ($p < 0.001$). For *Shopha* (swelling), there was a 51.41% relief, with a mean decrease from 2.47 to 1.20. In the *Toda* (pain) 95.80% reduction was observed, *Daha* (burning sensation) was relieved by 90.19%, and Congestion was reduced by 72.97%. Dysphagia showed 82.75% relief, while Halitosis improved by 84.34%. Lymph node enlargement was reduced by 43.58%, cough, and sore throat showed improvement by 93.15% and 90.74% respectively, Debris and follicles on the tonsils exhibited notable decreases of 88.09% and 54.4%, respectively.



Graph 1- Effect of therapy on subjective parameters

SHOWING IMAGES OF TONSILLAR ENLARGEMENT BEFORE (0 DAY) AND AFTER (60 DAY) TREATMENT

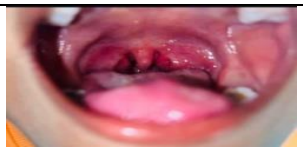
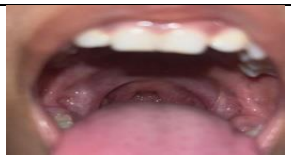
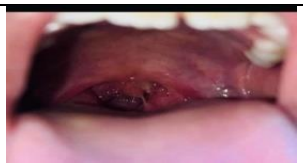
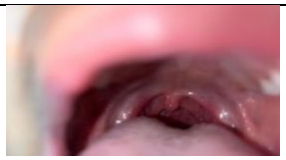
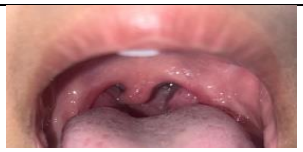
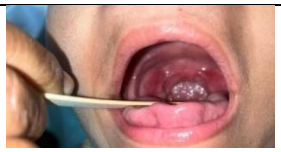
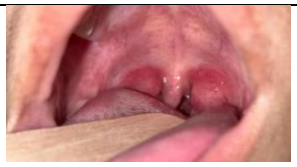
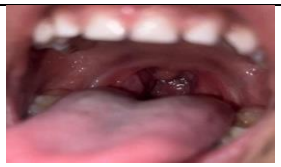
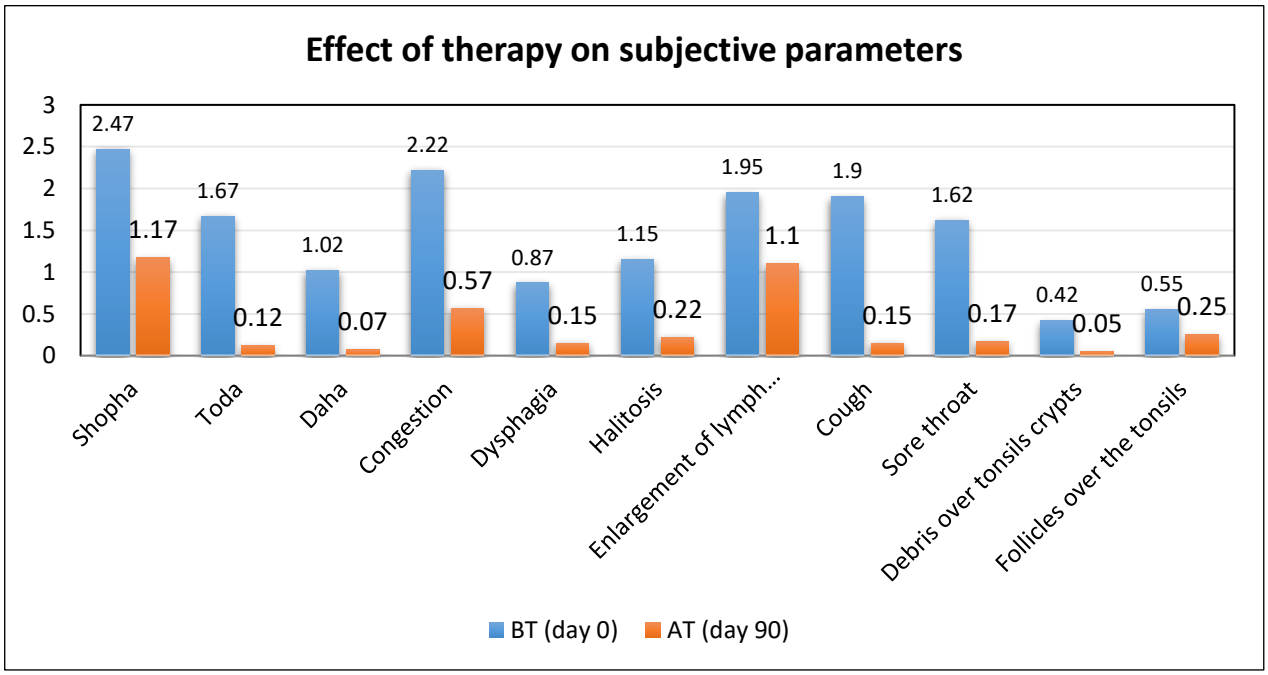
S. No.	BT Image of Tonsils	AT Image of Tonsils
1.	 201791(BT Grade-2)	 AT Grade-0
2.	 202046 (BT Grade-2)	 AT Grade-0
3.	 28973 (BTGrade-2)	 AT Grade-0
4.	 24454 (BT Grade-3)	 AT Grade-1

Figure No. 4.1

Table 2: Effect of therapy on subjective parameters using Wilcoxon matched sign rank test on day 90th (n=40)

Parameter	BT (day 0)	AT (day 60)	Mean Diff.	% relief	SD±	SE±	W	P Value	Result
Shopha	2.47	1.17	1.30	52.63%	0.56	0.08	741	<0.001	HS
Toda	1.67	0.12	1.55	92.81%	0.59	0.09	741	<0.001	HS
Daha	1.02	0.07	0.95	93.13%	0.59	0.09	528	<0.001	HS
Congestion	2.22	0.57	1.65	74.32%	0.57	0.09	780	<0.001	HS
Dysphagia	0.87	0.15	0.72	82.75%	0.67	0.10	300	<0.001	HS
Halitosis	1.15	0.22	0.92	80%	0.69	0.10	435	<0.001	HS
Enlargement of lymph nodes	1.95	1.10	0.85	43.58%	0.91	0.14	210	<0.001	HS
Cough	1.90	0.15	1.75	92.10%	0.89	0.14	666	<0.001	HS
Sore throat	1.62	0.17	1.45	89.50%	0.71	0.11	630	<0.001	HS
Debris over tonsils crypts	0.42	0.05	0.37	88.09%	0.54	0.08	105	<0.001	HS
Follicles over the tonsils	0.55	0.25	0.30	54.54%	0.46	0.07	78	<0.001	HS

The study tracked various health parameters from day 0 to day 90, showing significant improvements across the board, all highly significant ($p < 0.001$). For *Shopha* (swelling), a 52.63% reduction was observed, with the score decreasing from 2.47 to 1.17. *Toda* (pain) saw a 92.81% reduction, and *Daha* (burning sensation) showed a remarkable 93.13% improvement. Congestion was reduced by 74.32%, while Dysphagia improved by 82.75%, and Halitosis by 80%. Lymph node enlargement decreased by 43.58%, and cough improved by 92.10%. Sore throat showed an 89.50% improvement, while debris and follicles over the tonsils were reduced by 88.09% and 54.54%, respectively. All findings were statistically highly significant. All these symptoms showed significant reduction with very low p-values, indicating the treatment's high effectiveness.



Graph 2: Effect of therapy on subjective parameters (DAY 90)

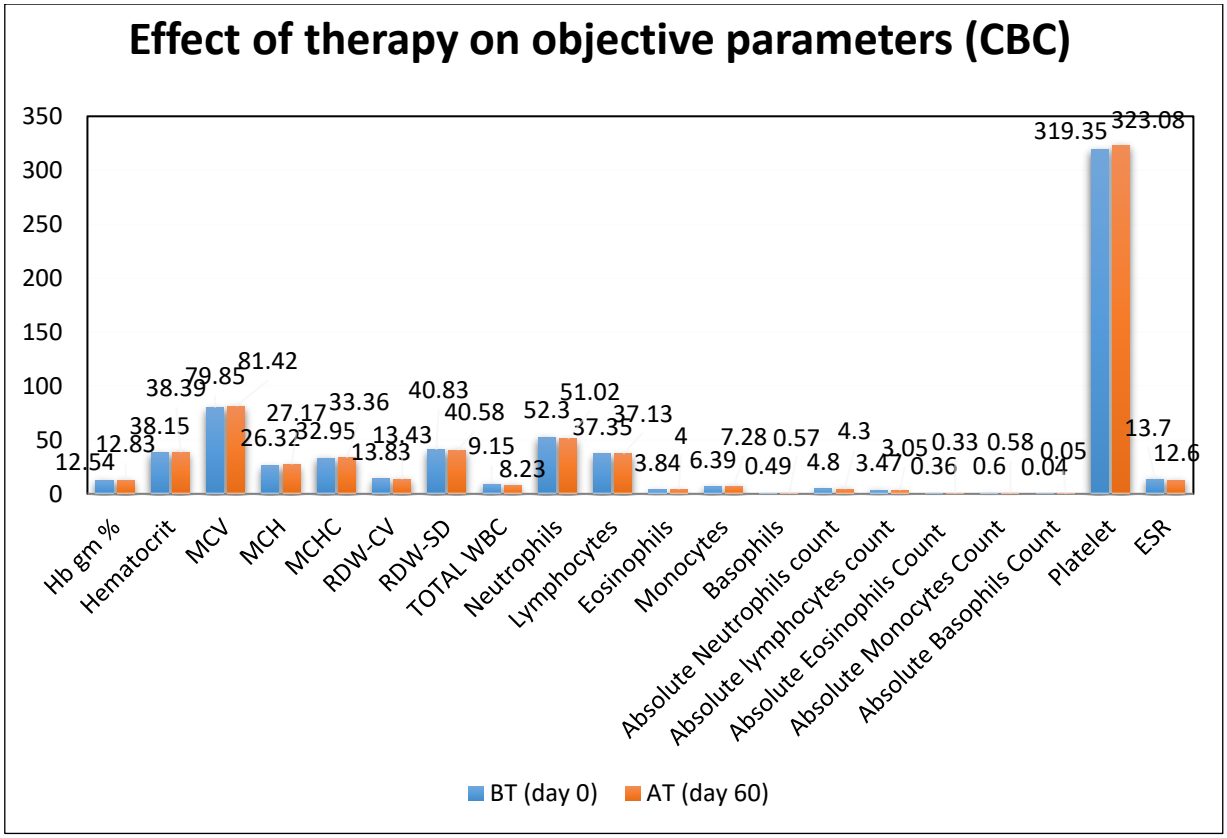
Table 3: Effect of therapy on objective parameters (CBC) using paired t-test on day 60th. (n=40)

Parameter	BT (day 0)	AT (day 60)	Mean Diff.	% relief	SD±	SE±	W	P Value	Result
Hb gm %	12.54	12.83	0.29	2.31%	1.10	0.17	1.70	0.09	NS
Hematocrit	38.15	38.39	0.23	0.60%	3.48	0.55	0.43	0.66	NS
MCV	79.85	81.42	1.56	1.25%	6.63	1.05	1.49	0.14	NS
MCH	26.32	27.17	0.85	3.22%	2.12	0.33	2.53	0.01	S
MCHC	32.95	33.36	0.41	1.24%	1.04	0.16	2.48	0.01	S
RDW-CV	13.83	13.43	0.39	2.81%	1.35	0.21	1.84	0.07	NS
RDW-SD	40.83	40.58	0.24	0.58%	4.42	0.70	0.34	0.73	NS
TOTAL WBC	9.15	8.23	0.91	9.94%	2.77	0.43	2.09	0.04	S
Neutrophils	52.30	51.02	1.28	2.44%	12.34	1.95	0.65	0.51	NS
Lymphocytes	37.35	37.13	0.21	0.56%	11.35	1.79	0.11	0.90	NS
Eosinophils	3.84	4.00	0.16	4.1%	3.00	0.47	0.33	0.73	NS
Monocytes	6.39	7.28	0.88	13.77%	2.11	0.33	2.65	0.01	S
Basophils	0.49	0.57	0.08	16.32%	0.32	0.05	1.54	0.12	NS
Absolute Neutrophils count	4.80	4.30	0.49	10.20%	2.12	0.33	1.47	0.14	NS

Absolute lymphocytes count	3.47	3.05	0.42	12.10%	1.32	0.20	2.03	0.04	S
Absolute Eosinophils Count	0.36	0.33	0.03	8.33%	0.28	0.04	0.71	0.48	NS
Absolute Monocytes Count	0.60	0.58	0.02	3.33%	0.23	0.03	0.53	0.59	NS
Absolute Basophils Count	0.04	0.05	0.00	0%	0.01	0.00	0.77	0.44	NS
Platelet	319.35	323.08	3.72	1.16%	81.43	12.87	0.28	0.77	NS
ESR	13.70	12.60	1.10	8.02%	11.49	1.81	0.60	0.54	NS

Over 60 days, various hematological parameters were monitored, revealing notable changes. Hemoglobin (Hb) showed a slight increase of 2.31%, though it was not statistically significant. Hematocrit increased slightly by 0.60%, and the Mean Corpuscular Volume (MCV) improved by 1.25%, but both changes were also non-significant. The Mean Corpuscular Hemoglobin (MCH) increased by 3.22%, while the Mean Corpuscular Hemoglobin Concentration (MCHC) increased by 1.24%, both showing significant statistical improvements (P=0.01). Red Cell Distribution Width (RDW-CV) decreased by 2.81%, while RDW-SD remained largely unchanged.

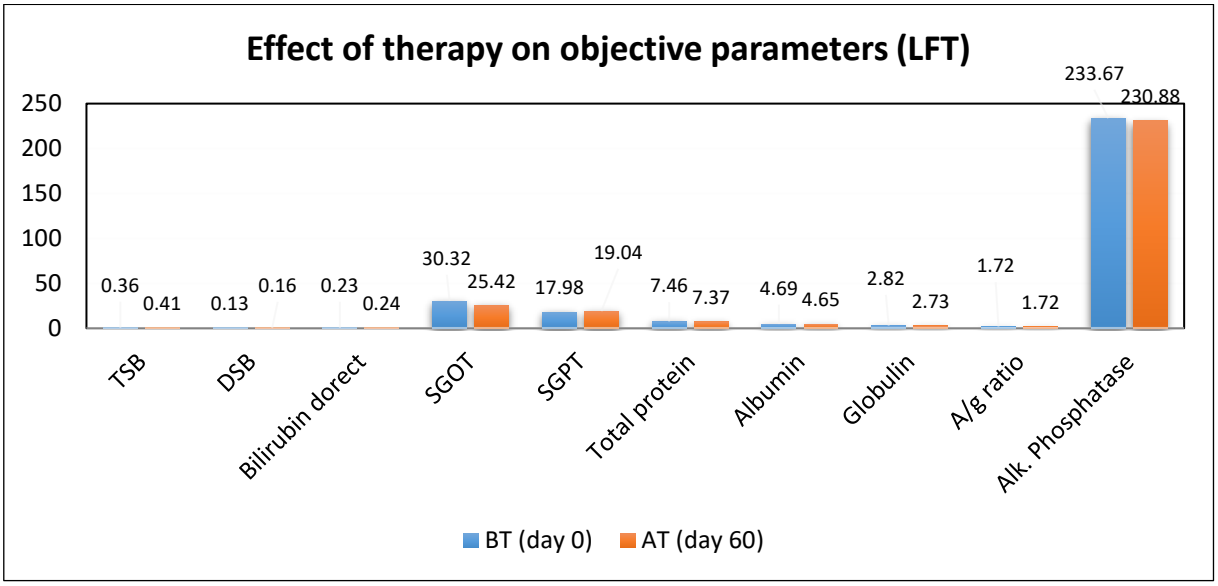
White Blood Cell (WBC) count saw a significant decrease of 9.94% (P=0.04), with absolute lymphocyte count also dropping by 12.10%, achieving significance (P=0.04). However, other white cell parameters like neutrophils, eosinophils, monocytes, and basophils did not exhibit substantial changes. Notably, there was a 13.77% increase in monocytes (P=0.01). The platelet count increased slightly by 1.16%, but this was not significant. Similarly, the Erythrocyte Sedimentation Rate (ESR) showed an 8.02% decrease, without reaching statistical significance.



Graph 3: Effect of therapy on objective parameters (CBC) using paired t-test. (n=40)

Table 4: Effect of therapy on objective parameters (LFT) using paired t-test on day 60th. (n=40)

Parameter	BT (day 0)	AT (day 60)	Mean Diff.	% relief	SD±	SE±	t value	P value	Result
TSB	0.36	0.41	0.04	11.11%	0.19	0.03	1.46	0.15	NS
DSB	0.13	0.16	0.03	23.07%	0.07	0.01	2.48	0.01	S
Bilirubin direct	0.23	0.24	0.00	0%	0.15	0.02	0.09	0.92	NS
SGOT	30.32	25.42	4.89	16.12%	13.7	2.17	2.25	0.02	S
SGPT	17.98	19.04	1.06	5.89%	11.54	1.82	0.58	0.56	NS
Total protein	7.46	7.37	0.09	1.20%	0.62	0.09	0.92	0.36	NS
Albumin	4.69	4.65	0.04	0.85%	0.60	0.09	0.46	0.64	NS
Globulin	2.82	2.73	0.08	2.83%	0.44	0.06	1.24	0.22	NS
A/g ratio	1.72	1.72	0.00	0%	0.36	0.05	0.06	0.95	NS
Alk. Phosphatase	233.67	230.88	2.79	1.19%	103.53	16.36	0.17	0.86	NS

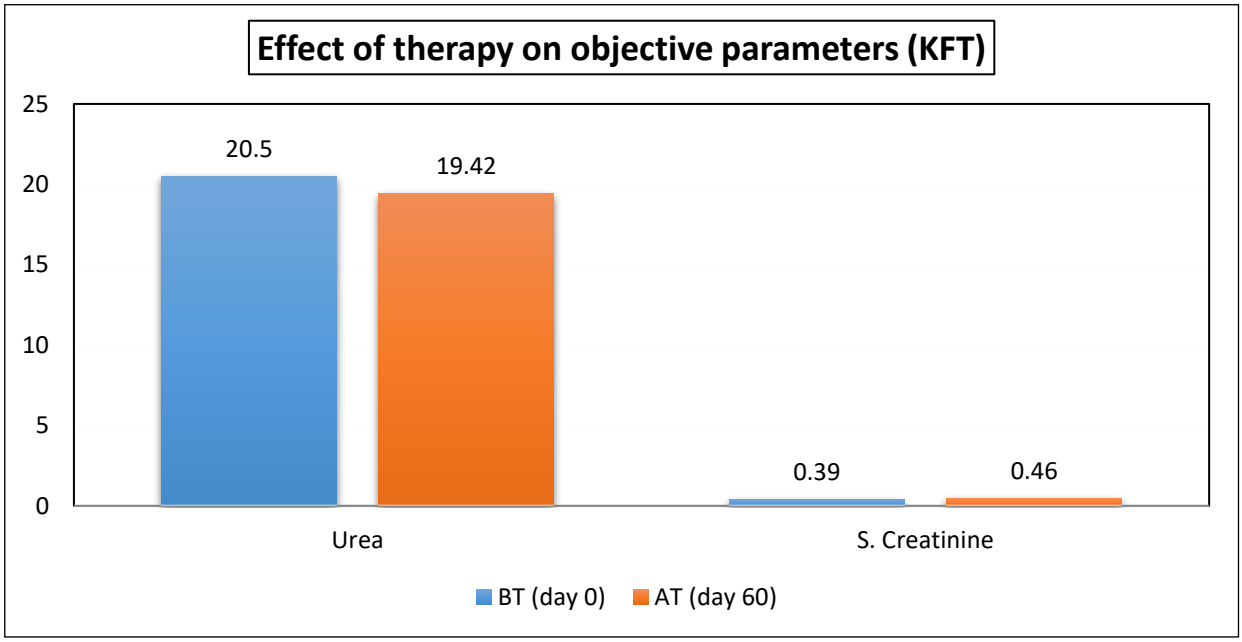


Graph 4: Effect of therapy on objective parameters (LFT) using paired t-test. (n=40)

Over the course of 60 days, changes were observed in several liver function parameters. Total Serum Bilirubin (TSB) increased by 11.11%, but the change was not statistically significant (P=0.15). Direct Serum Bilirubin (DSB), however, showed a significant increase of 23.07% (P=0.01). There was no significant change in direct bilirubin levels (0%). SGOT (AST) decreased by 16.12%, which was statistically significant (P=0.02), while SGPT (ALT) increased by 5.89%, though the change was not significant (P=0.56). Total protein levels saw a slight decline of 1.20%, and albumin decreased marginally by 0.85%, both of which were non-significant. The globulin levels dropped by 2.83%, while the albumin-to-globulin ratio remained unchanged.

Table 5: Effect of therapy on objective parameters (KFT) using paired t-test on day 60th. (n=40)

Parameter	BT (day 0)	AT (day 60)	Mean Diff.	% relief	SD±	SE±	t value	P value	Result
Urea	20.50	19.42	1.08	5.26%	6.77	1.07	1.01	0.31	NS
S. Creatinine	0.39	0.46	0.07	17.94%	0.14	0.02	3.07	0.00	S



Graph 5: Effect of therapy on objective parameters (KFT) using paired t-test. (n=40)

The dataset compares the biochemical parameters of Urea and Serum Creatinine before (BT) and after (AT) a treatment, along with their statistical significance. Urea levels decreased from 20.50 to 19.42 ($p = 0.31$, NS), with a percentage of 5.27%. Serum Creatinine levels mildly increased from 0.39 to 0.46 ($p < 0.01$, S), with a percentage of 17.95%.

The study demonstrated the efficacy of the Tonsenorm compound in managing tonsillitis, with significant improvements observed across multiple parameters. Swelling (*Shopha*) reduced by 51.41% by day 60, increasing slightly to 52.63% by day 90, primarily due to the anti-inflammatory properties of *Shirisha* (*Albizia lebbeck*), *Guduchi* (*Tinospora cordifolia*), and *Ativisha* (*Aconitum heterophyllum*). *Shirisha's Kapha-Pitta* pacifying and mast-cell stabilizing properties, combined with *Guduchi's* immunomodulatory and anti-inflammatory effects contributed to reducing tissue congestion and inflammation. Pain (*Toda*) relief was remarkable, with 95.80% improvement by day 60 and 92.81% by day 90, attributed to the analgesic actions of *Shunthi* (*Zingiber officinale*), *Ativisha*, and *Tankan Bhasma*, which reduce inflammation and alleviate discomfort.[4]

The burning sensation (*Daha*) saw a reduction of 90.19% by day 60 and 93.13% by day 90, due to the *Pitta*-pacifying and cooling properties of *Guduchi* and *Shirisha*. Congestion improved by 72.97% at day 60, progressing to 74.32% by day 90, with *Pippali* (*Piper longum*) and *Shunthi* playing key roles in clearing respiratory channels and reducing mucus production. Dysphagia (difficulty swallowing) showed an 82.75% improvement by day 60, sustained through day 90, due to the combined anti-inflammatory and tissue-healing properties of *Guduchi*, *Shirisha*, and *Tankan Bhasma*.[5]

Halitosis (bad breath) improved significantly, with 84.34% relief by day 60 and 80% by day 90, linked to the antimicrobial and digestive-supportive properties of *Shunthi*, *Maricha* (*Piper nigrum*), and *Gandhaka* (Sulphur). Lymph node enlargement decreased by 43.58% by both day 60 and day 90, reflecting the immune-modulatory actions of *Guduchi* and *Shirisha*. Cough and sore throat showed over 93.15% and 92.10% relief, respectively, by day 90, highlighting the respiratory benefits of *Pippali*, *Shunthi*, and *Shirisha*, which reduce throat irritation, clear mucus, and combat infection. Tonsillar debris showed an 88.09% reduction by day 60 and day 90, with follicular involvement improving by 54.4%, due to the antimicrobial actions of *Yashada Bhasma* (zinc) and *Tankan Bhasma*.[6]

Objective parameters also indicated significant improvements. Hematological markers, including MCH and MCHC, showed significant increases ($p = 0.01$), reflecting enhanced erythropoiesis and oxygen-carrying capacity, while reduced WBC count ($p = 0.04$) signified decreased inflammation. *Guduchi* and *Shirisha's* antioxidant and immune-modulatory properties supported these outcomes. Liver function (SGOT levels) improved significantly ($p = 0.02$), without evidence of liver stress, showcasing the hepatoprotective effects of *Guduchi*. Kidney function remained stable, with only a slight increase in serum creatinine ($p = 0.00$), suggesting mild detoxification.

In conclusion, the Tonsenorm compound provided significant relief from the symptoms of chronic tonsillitis within 60 and 90 days, with improvements in swelling, pain, congestion, burning sensation, and associated clinical and hematological markers. Its potent anti-inflammatory, analgesic, antimicrobial, and immune-modulatory properties highlight its effectiveness as a therapeutic option for managing tonsillitis.

Mode of action of Tonsenorm compound on *Tundikeri*

The herbs and minerals present in Tonsenorm act on these *doshas* to bring about a significant therapeutic effect, offering relief from both the symptoms and the underlying causes of the condition, due to its blend of potent herbs and minerals like *Shirisha, Guduchi, Ativisha, Shunthi, Pippali, Maricha, Gandhaka, Tankana*, and *Yashada Bhasma*.[7] These ingredients work synergistically to address the core symptoms of tonsillitis, such as inflammation, swelling, mucus accumulation, and pain. *Shirisha* and *Guduchi*, with their *Tridoshahara* properties, balance all three *Doshas—Vata, Pitta*, and *Kapha*—thereby reducing inflammation and enhancing immune response. [8]The *Katu Rasa* (pungent taste) and *Ushna Veerya* (hot potency) of herbs like *Ativisha, Shunthi, Maricha*, and *Pippali* help clear excess mucus, relieve swelling, and alleviate the cold and congestive symptoms of *Kapha Dosha*. Minerals like *Gandhaka* and *Tankana* further contribute with their strong antimicrobial and anti-inflammatory properties, addressing the infection and promoting healing. Additionally, *Yashada Bhasma*, with its *Kashaya Rasa* (astringent) and *Shita Veerya* (cold potency), soothes the inflamed throat tissues, reduces heat, and clears mucus, aiding in faster recovery. Altogether, Tonsenorm's ability to balance the *doshas*, reduce inflammation, enhance immunity, and clear respiratory blockages makes it a comprehensive and effective treatment for tonsillitis.[9]

CONCLUSION

The study concludes that the Tonsenorm compound is highly effective in managing both the short-term (60 days) and long-term (90 days) symptoms of tonsillitis. It significantly reduced swelling, pain, burning sensation, congestion, halitosis, lymph node enlargement, and difficulty swallowing, while improving hematological and liver function parameters. The compound's efficacy is attributed to its potent combination of herbs and minerals, such as *Shirisha*, *Guduchi*, *Shunthi*, *Ativisha*, *Tankan Bhasma*, and *Yashada Bhasma*, which exhibit strong anti-inflammatory, analgesic, antimicrobial, and immune-modulatory properties.

These actions address the underlying causes of tonsillitis by reducing inflammation, enhancing immune response, alleviating infection, and promoting tissue healing. The findings support the use of Tonsenorm as a holistic and effective therapeutic option for managing tonsillitis, aligning with both Ayurvedic principles and modern pharmacological evidence. Overall, the study demonstrates that Tonsenorm provides sustained relief from key symptoms, improves immune and inflammatory markers, and promotes overall health and well-being.

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