



CLINICAL STUDY TO EVALUATE THE EFFICACY OF YAVAKSHARA PRATISARANA IN THE MANAGEMENT OF TUNDIKERI (CHRONIC TONSILLITIS)

Akshata Narayana Moger¹, Abhijith H N²

¹PG Scholar,

²Associate Professor, Department of Shalakya tantra, Shri Dharmasthala Manjunatheshwara College of Ayurveda and Hospital, Hassan-573201

Corresponding Author: Akshata Narayana Moger, PG Scholar, Department of Shalakya tantra Shri Dharmasthala Manjunatheshwara College of Ayurveda and Hospital, Hassan-573201

Article DOI: <https://doi.org/10.36713/epra8656>

DOI No: 10.36713/epra8656

ABSTRACT

Introduction: The symptoms of Tundikeri resembles with Chronic Tonsillitis. This disease is more frequent in young and middle aged adults. If not treated in time, chronic tonsillitis may lead to Middle ear infection, Rheumatic fever, Nephritis, Rheumatic heart disease and many other systemic complications. Looking into above facts there is a need of treatment which can prevent complications of the disease as well as reduces the recurrence effectively. In this study an effort has been made to evaluate the efficacy of Yavakshara pratisarana in Tundikeri (Chronic Tonsillitis).

Materials and methods: The present study was an open labelled, single arm, clinical study in Tundikeri (Chronic Tonsillitis) (n=30) selected using convenience sampling technique with pre and post design conducted in a tertiary Ayurveda healthcare centre attached to a teaching institute, situated at the district headquarters in South India. 31 patients fulfilling the inclusion criteria suffering from Tundikeri w s r to Chronic Tonsillitis were selected with the intervention of Yavakshara pratisarana in single sitting.

Results: The effect of therapy was assessed before and after treatment, the results were statistically analyzed; it showed significant changes in subjective parameters like Katina shopha, Mandaruk, Galaragata, Galoparodha, Halitosis, Enlarged Jugulodigastric lymph nodes, and Objective parameter- ESR

Conclusion: Yavakshara pratisarana has shown better efficacy in subjective parameters like Katinashopha, Mandaruk, Galaragata, Galoparodha, Halitosis, Enlarged Jugulodigastric lymph nodes, and Objective parameter like- ESR

KEY WORDS: Tundikeri, Yava kshara, Pratisarana.

INTRODUCTION

In Ayurveda, Tundikeri is described under Mukha roga. Acharya Sushrutha has mentioned Tundikeri as Talugata roga and Acharya Vagbhata as Kantagata roga.

Tundikeri presents with the features of Katina shopha (enlargement of tonsils) in Hanusandhi, Mandaruk (pain), Toda (pricking sensation), Daha (burning sensation) and resembles Karpasa phala^{1, 2} (fruit of cotton). Mainly caused due to vitiation of Kapha and



*Raktha dosha*³

Tundikeri is commonly encountered now days due to the dietary habits of taking spicy food, cold beverages and cold climate. Lower socio-economical people are particularly prone as the immunity status is low in them. These factors coupled together results in recurrent episodes of the disease.

In modern science *Tundikeri* can be co-related to Tonsillitis. Tonsillitis is the infection of tonsils, situated on either side of back of throat, which forms vital part of immune system and aids the body in fighting diseases and infections.

Tonsillitis is one of the most common disease of upper respiratory tract which affects all age groups, It is estimated that 15% patient visit to a family doctor are because of Chronic Tonsillitis⁴. At puberty prevalence rise to 70-90%. Most common age of Tonsillitis found to be 11-21(56%) ; 21-30(20%) ; <10(10%) ; 31-40(9%) ; 41-50(3%) ; 50(1%)⁵.

If not treated in time, chronic tonsillitis may lead to Middle ear infection, Rheumatic fever, Nephritis, Rheumatic heart disease and many other systemic complications⁶.

Antibiotics are the main stay of treatment in allopathic medicine which gives temporary relief and does not check the recurrence of disease and sets a platform for Tonsillectomy, which has its own complications.

Looking into above facts there is a need of treatment which can prevent complications of the disease as well as reduces the recurrence effectively.

Many treatment modalities are described in *Mukharogas*, among them *Shastrakarma* is said to be the effective one⁷. *Kshara* is said be *Pradhana* among *shastra* and *anushastra karmas*.

The *yavakshara pratisarana* was selected from *Rasa tarangini* for this present clinical trial. This formulation is indicated in all types of *Kanthagata Roga* in the form of *Kavala* and *Pratisarana*⁸ etc.

Pratisarana with *Yavakshara* mentioned in *Rasa tarangini* in the management of *Tundikeri* possess qualities like *kaphahara*, *Vrana shodhaka*, *ropaka* as well as crapping effect, *Kapha-Rakta Shamaka*, *Lekhaka*, *Shodhaka*, *Krimihara*, *Shothahara*, etc properties. The *Kshara* does the *Ksharana* of localized *Vikriti* and thus helps in *Samprapti Vighatana*.

Sushruta opines that the diseases which can be treated with *Kavala* can also be treated with *Pratisarana*⁹. Keeping this into consideration, the present study was planned to evaluate the efficacy of *yavakshara Pratisarana* in the management of

Tundikeri (Chronic Tonsillitis).

AIMS AND OBJECTIVES

To Evaluate the effect of *Yava kshara Pratisarana* in *Tundikeri*.

MATERIALS AND METHODS

Source of data: The patients will be selected from the out patient and in patient department of Sri Dharmasthala Manjunatheshwara College of Ayurveda and Hospital, Hassan.

Ethical Committee Approval Number – SDM/IEC/65/2019

Clinical Trial Registry of India – CTRI/2020/11/029371

CRITERIA OF EVALUATION

DIAGNOSTIC CRITERIA

Diagnosis will be made on the basis of any of the 4 symptoms of *Tundikeri*.

- *Kathina Shopha* (enlargement of tonsils)
- *Manda Ruk* (pain)
- *Ragata* (hyperemia)
- *Galoparodha* (dysphagia)
- *Mukha daurgandhya* (Halitosis)
- Enlargement of lymphnodes.

INCLUSION CRITERIA

Age group between 16-50 years
Irrespective of gender, religion, socioeconomic status

- Patients clinically diagnosed with *Tundikeri* and fit for *Ksharakarma*.
- Patients ready to sign informed consent form.
- Patient not respond to medical management will be included.
- Parents willing to sign the informed assent form (age group between 16-18 year)

EXCLUSION CRITERIA

- Patient with Acute tonsillitis, Peritonsillar abscess, Acute otitis media, Tonsillar cyst.
- Uncontrolled Hypertension and Diabetes Mellitus
- Physiological conditions like pregnancy, lactation and puerperal stage.

STUDY DESIGN The present study was an open labeled, single arm, clinical study in *Tundikeri* (Chronic Tonsillitis) (n=30) selected using convenience sampling technique with pre and post design conducted in a tertiary Ayurveda healthcare centre attached to a



teaching institute, situated at the district headquarters in South India

LABORATORY INVESTIGATION

Following lab investigations will be performed for the diagnosis.

Blood investigations: ESR, DC, TC, Hb%.

DRUG ADMINISTRATION

Drug: Yavakshara

Dosage: As required

Duration: single sitting application

ASSESSMENT CRITERIA

The subjects will be accessed before treatment (0th day), after 24 hours of treatment (1st day) and on eighth day (8th day) and after this subject will be asked to visit the center on 15th and 30th day of treatment to notice any changes if occurred. Assessment table is given at (Table 1)

PARAMETERS

Both subjective and objective parameters will be assessed.

Subjective parameters

1. *Kathina shopha* (Enlargement of tonsils)
2. *Manda Ruk* (Pain)
3. *Ragatwa* (Redness)
4. *Galoparodha* (Dysphagia)
5. Halitosis
6. Jugulo-digastric lymphadenopathy

Objective parameters

1. Pictorial presentation
2. Investigation

STATISTICAL ANALYSIS

- Friedman's test was applied to analyze the significance of change in Subjective parameters
- Wilcoxon signed rank test was done as post hoc with Bonferroni correction on parameters which show significance in Friedman's test, to interpret the time of significant change
- Paired T test was done for analyzing the significance of objective parameters

OBSERVATION

In the present study total 42 subjects were screened, out of which 33 subjects were registered for the study, among them 31 subjects completed the study

and 2 were dropped out Among 31 completed subjects maximum (n=15) were from the age group of 31-60 years and predominance of females (n=27) over males was found. 14 subjects were from middle class group and majority of them (n=19) were having sedentary life style. Diet wise distribution showed maximum (n=31) were having non veg diet ,14 were habituated to Guru ahara ,(n= 9)subjects to Dadi/ksheera, (n=7) subjects were habituated to cold beverage. Considerable number of subjects (n=14) were having mandagni ,(n=11) subject were practicing vishamashana, maximum number of subjects (n=16) were having moderate oral hygiene

RESULTS

In the present study total 42 subjects were screened, out of which 33 subjects were registered for the study, among them 31 subjects completed the study and 2 were dropped 32 subjects were underwent application of Yavakshara pratisarana in single sitting Friedman's test was run on subjective parameters and has shown significant improvement in symptoms like Katina shopha ,Mandaruk,Galaragata,Galoparodha, Halitosis ,jugulodaigarstic. Results are placed at (Table 2) Paired t Test was run on objective parameters like HB, TC, DC and ESR . ESR values has shown significant improvements. Results are placed at (Table 3)

DISCUSSION

EFFECT OF THERAPY ON SUBJECTIVE PARAMETER

Effect on Katina shopha :

There was significant reduction Katina shopha , Wilcoxon signed rank test as post hoc test with Bonferroni correction - 0.01 also showed reductions in between D1 to D30 (p < 0.001)The *Shopha* (Swelling) is due to inflammatory process in tonsils. When the inflammatory process begins in the tonsillar tissue, it becomes swollen and causes the symptoms like pain in throat, difficulty in deglutition (dysphagia).

Vitiation of *kapha* and *rakta* invariably involved in the pathogenesis of *Tundikeri* will bring about inflammatory changes, due to which there will be pain in the throat. Intensity of pain depends upon extent of inflammation.

This might be due to two reasons. Viz. –

- The antibacterial and anti-inflammatory action of the drug clears the infective focus. Thus, the tonsillar tissues might have relieved from inflammatory symptoms. *Kapha –pitta hara* and *Shotha hara* property of *yava*



brings down the inflammation and also by analgesic effect of *yava* reduces the intensity of pain.

- The overall property of the formulation is *Kshareeya* in nature. It is responsible for *Chhedana, Bhedana, Lekhana karma* in the tonsillar tissue. Though the medication is applied over the surface of the tonsils it penetrates in to the crypts and core of tonsillar tissue by means of its *Sukshma, Teekshna, Vyavayi* properties. The drug also acts as an agent for chemical cauterization by which causes the atrophy of inflamed tonsillar tissue.

Effect on manda ruk

- There was significant reduction in manda ruk, Wilcoxon signed rank test as post hoc test with Bonferroni correction - 0.01 also showed reductions in between D1 to D30 ($p < 0.001$) Vitiating of *kapha* and *rakta* invariably involved in the pathogenesis of *Tundikeri* will bring about inflammatory changes, due to which there will be pain in the throat. Intensity of pain depends upon extent of inflammation.
- *Kapha –pitta hara* and *Shothahara* property of *Yavakshara* brings down the inflammation and also by analgesic effect of *Yava* reduces the intensity of pain.

Effect on Galaragata

- There was significant reduction in *Galaragata*, Wilcoxon signed rank test as post hoc test with Bonferroni correction - 0.01 also showed reductions in between D1 to D30 ($p < 0.001$)
The change in colour of mucus membrane is due to the inflammatory process in the tonsillar tissues. *Ragatwa* is assessed on changes in colour of muco-lymphoid tissues. The change in colour of mucus membrane varies as per changing pattern of vascularity
The probable reason might be the action of medication till the core of tonsillar tissue which subside the disease through its invaded area. The trial drug due to its anti-inflammatory, analgesic action reduces the inflammation and hence colour of the mucus membrane becomes normal.

Effect on Galoparodha

- There was significant reduction in Galoparodha, Wilcoxon signed rank test as

post hoc test with Bonferroni correction - 0.01 also showed reductions in between D1 to D30 ($p < 0.001$)

Dysphagia is due to inflammatory process and increase in the size of the tonsils and surrounding areas. The inflammatory process in tonsils causes pain in throat. The pain felt by the patient was assessed on the basis of extent and its appearance like mild tolerable pain during deglutition of food articles, liquids.

The intensity, appearance and nature of pain changes as the inflammatory process come down. The anti-inflammatory and analgesic action of the drug property of drug reduces pain on deglutition.

Effect on size of lymph node

- There was significant reduction in size of lymph node, Wilcoxon signed rank test as post hoc test with Bonferroni correction - 0.01 also showed reductions in between D1 to D30 ($p < 0.001$)
The Jugulo-digastric lymphadenopathy is a clinical feature predominantly in chronic tonsillitis with minimal pain and hypertrophy. The reduction in inflammation, signs and symptoms of tonsils result in reduction in size of lymph nodes.

Effect on Mukhadourgandya

- There was significant reduction in Mukhadourgandya, Wilcoxon signed rank test as post hoc test with Bonferroni correction - 0.01 also showed reductions in between D1 to D30 ($p < 0.001$) Though, halitosis is not mentioned in classics as a clinical feature, it is found in clinical practice and literature of contemporary sciences. Halitosis is one of the features observed in chronic tonsillitis, pharyngitis or Pharyngo-tonsillitis. Apart from this there are several other causes which cause systemic conditions which causes halitosis like poor digestive power, coated tongue. The probable reason can be taken as the medication acts as (*Vaktra shodhana*), by acting upon the accumulated *Vikrita Kapha* causing Halitosis and as infection reduces complaint of Halitosis will be reduced



EFFECT OF THERAPY ON OBJECTIVE PARAMETER

Analysis of change in the Hemoglobin concentration BT and AT had insignificant changes in the Hemoglobin percentage which implied that treatment was ineffective in increasing the Hemoglobin concentration of tonsillitis patients of the study.

Trial drug was effective in the reduction of ESR after treatment ($p < 0.05$). Statistically significant reduction of these parameters implies the control of the infection

Pictorial presentation – significant change when compared with before and after the treatment (Fig number -01)

Probable mode of action of *Yavakshara*

- The *Yavakshara* possess qualities like *lekhana*, *shothahara*, and *kapha-raktha hara*.
- *Yavakshara* is *shothahara*, *vedanahara*, *amapachaka* and by its *lekhana guna* it scrapes the vitiated *kapha dosha*. It possess the *Ksharana* and *Shodana* quality which reduces the obstructive lesions in throat and helps in reducing the pain and does *dosha shamana*.
- *shothahara* by which it helps to reduce the inflammation of the tonsils and also its antibacterial property reduces the infective condition.
- has the property of *shulaprashamana*, *krimighna*, *jwaraghna*, and *deepana*, which reduces the inflammatory changes in the oral mucosa and tonsils..

1. Ksharana – This property helps in *Ksharana* of *Vikrita Kapha* and *Mala* accumulated in oral cavity, and alleviates the halitosis and thus helps in reducing the symptoms.

The *Ksharana* effect of medication could have removed the debris and wastes from surface of tonsils as well as deposited elsewhere in oral cavity

The patients Parenchymatous tonsillitis responded well due to *Ksharana* property of the formulation.

2. Anti-biotics – Different phytochemicals, high percentage of low polar compounds, and various amino acids like histidine, tryptophan etc helps in arresting the further growth of bacteria and inflammatory processes. This also prevents the complications of the diseases.

3. Antimicrobial – The formulation contains

lysine bitter principles, which acts as anti-microbial agent and reduces the growth of micro organisms like bacteria and viruses.

4. Analgesics – Once inflammation subsides by *pratisarana*, pain reduces and also this formulation possess analgesic property which helps in alleviating the pain.

PROBABLE MODE OF ACTION OF PRATISARANA

The word meaning of *Pratisarana* is *Gharshana* or rubbing. In present clinical study the *Pratisarana* of *Yavakshara* is performed over the tonsils. Its probable mode of action can be assumed as follows – **Action of Lignox 10%** –

It is a local anaesthetic agent, used to desensitize the mucosa of the oro-pharynx and palate temporarily. This prevents the gag reflex, pain of procedure and irritation due to medications. This facilitates the convenience of the procedure even in non-cooperative patients. With in 1 to 2 two hours of procedure patient regains the sensation and gustatory perception.

Action of cotton ball rubbing over the anterior surface of tonsils –

The gentle rubbing of the cotton over the tonsils in case of follicular tonsillitis, ruptures the follicles and opens the crypts. It removes the sticky thick mucosal coating from the anterior surface of tonsils and facilitates the direct contact of tonsil tissue with the medication. This facilitates easy penetration of the medicine into crypts to reach the action of medication till core of tonsils.

Action of the medication over the tonsillar tissue –

explains that *Rasa* acts when it comes in contact with mouth, *vipaka* acts after digestion and *virya* acts at the both level internally and externally. Hence for mode of action of *pratisarana* drug, we have to rely on *Rasa* and *Virya* of drug. Due to *Laghu ruksha guna* subsides *kapha dosha*, *ushna virya* both *vata* and *kapha*, Due to *Ushna virya*, and *laghu*, *Ruksha guna*, it stimulates *agni* and due to its *ushna virya*, *teekshna*, *laghu guna* removes *Srothorodha* and vitiation of *Rakta dhatu* is normalized by *katu*, *madhura rasa* properties of drugs

The medication contains the *Kshareeya dravya* and *lekhana property*, (it corrodes the hypertrophied muscle tissue) which acts as a chemical cauterizing agent over the tonsillar tissues. By the local application of *Kshara* it reduces the *Vikrita Kapha*. Due to *Chhedana*, *Bhedana* action of *Kshara*, it reduces the



size of tonsils significantly due to its *Ruksha Guna*, it has *Kledahara* property. Due to *Katu Rasa*, it causes “*Shonita Sanghatam Bhinnatti*” (clears the obstruction in Raktavaha strotas)

The alkaline medication entered into core of tonsils cause chemical cauterization. Due to *Cchedana*, *Bhedana*, *Ushna*, *Teekshna* properties forms minute burns and there is a coagulation of muco-lymphoid tissues. This reduces the intracellular space and aggregates the lymphoid tissues. This intern stimulates fibrosis of tonsillar tissue and reduces the size of the tonsils.

CONCLUSION

- 1) The study drug, *Yavakshara pratisarana* is effective in reducing the majority of signs and symptoms of Chronic Tonsillitis.
- 2) *Yavakshara pratisarana* is effective in reducing the number of attacks of Chronic Tonsillitis.
- 3) *Yavakshara pratisarana* has provided sustained effect.

Financial Support and sponsorship: Nil

Conflicts of interest: There are no conflicts of interest

REFERENCES

1. *Astanga hrudaya of vagbhata, with commentaries sarvangasundari of arunadatta and Ayurveda rasayana of hemadri, edited by bhisagacharya Hari sadashiva satri paradakara, chowkhamba surbharati prakashan Varanasi, Edition-2010, uttarasthana 21st chapter, 47th verse.*
2. *Sushruta Samhita of susruta, with the Nibandhasangraha commentary of sri dalhanacharya and the Nyaya Chandrika of sri*

gayadasacharya on nidanasthana, edited by Vaidya yadavji trikamji Acharya and Narayan ram Acharya kavyatirtha, chaukambha Sanskrit sansthana, Varanasi, Edition-2012, Nidhanasthana, 16th chapter, 42 verse.

3. *Bhavaprakasha of Bhava Mishra (vol-2) Uttara and madhyama khanda, Translated by Prof.K.R. Srikantha Murthy. Edition-2009, 66th chapter, 100th verse.*
4. *G.P Arun raj, U Shailaja, N Prasanna Rao. Chronic tonsillitis in children :An Ayurvedic Bird View. IAMJ[Internet]; 2013 AUG :Volume VOL 1 (4). Available form: <http://www.iamj.in/images/upload/IAMJ12.pdf>*
5. *Sarode D S, Bhole A V. Prevalence of chronic tonsillitis at ENT inpatient department: a hospital based study. IJM(internet). 2015 Nov 23 vol 2(11); p 788.*
6. *Diseases of Ear, Nose and Throat and head and neck surgery by PL Dhingra, 6th edition.*
7. *Vagbhata, Arunadatta, Hemadri, Uttaraasthana chapter 22 Mukharoga pratishedam verse 56. In: Shastri Hari Sadashiva (edi.). Astangahrudaya with Sarvangasundara and Ayurvedarasayana commentaries. Reprint 2011 edition. pune: Chaukambha Sanskrit Sansthan; 2011: p. 528*
8. *Pranacharya Sadanandasharma, Shree Haridatta Acharya, Acharya Dharmanandashastri. Ksharatrika Vijnaniya trayodasha Taranga Chapter 13 verse 6. In : Kashinath Shastri (edi.) Rasatarngini, 2014 edition. Varanasi: Motilala Banarasidas; 2014: p-308.*
9. *Sushruta. Sushruta Samhita edited with Ayurveda Tattva Sandipika commentary. Edited by Kaviraj Ambikadutta Shastri. 13th Edition 2002. Chikitsasthana 40th Chapter 71th Shloka. Varanasi: Chaukhamba Sanskrita Samsthana. p.186s*

Table: 1 Self formulated Scale for assessment of Subjective parameters

SI NO	Assessment criteria	0	1	2	3	4
1.	Size of Tonsil (Khatina shopha)	No tonsils seen	Small tonsils within the tonsillar fossa.	Visible beyond anterior pillars.	Extended 3/4 th of way to midline.	Completely obstructing airway. (kissing tonsils)
2.	Mandaruk (pain)	No pain	Pain on external pressure	Pain during deglutition and relieves thereafter	Pain increases on deglutition and remains Consistent	
3.	Galaragata (Hyperaemia)	No hyperaemia	Hyperaemia of tonsil surface.	Pinkish appearance of Pillars	Reddish appearance of surrounding	Reddish appearance of pharynx
4.	Galoparodha (Dysphagia)	No pain while swallowing.	Pain during swallowing solid food	Pain during swallowing solid food	Pain during consuming liquid food	Continuous pain or unable to swallow.



			substance.	substance.	substance.	
5.	Mukhadourgandya (Halitosis)	No halitosis	Foul breath experienced by patient only.	Foul breathe experienced by patient & friends or parents.	Foul breathe experienced by a group of surrounding people.	Foulbreath experience by as soon as the patient opens the mouth.
6.	Enlargement of lymph nodes	No palpable lymph nodes.	Palpable lymph node U/L, warm	Palpable lymph nodes B/L, soft fluctuant.	Palpable lymph nodes B/L which are hard	Palpable lymph nodes B/L which are hard

Table: 2 Showing effect of yavakshara pratisarana on subjective parameters by applying Friedman's test

Parameters	N	Mean Rank	Chi Square (x2)	p value	Remarks
<i>Katina shopha</i> BT	31	4.39	101.249	< 0.001	Significant
<i>Katina shopha</i> 1 st DAY		4.19			
<i>Katina shopha</i> 8 th DAY		2.37			
<i>Katina shopha</i> 15 th DAY		2.05			
<i>Katina shopha</i> 30 th DAY		2.00			
<i>Mandaruk</i> BT	31	4.79	109.873	<0.001	Significant
<i>Mandaruk</i> 1 st DAY		3.92			
<i>Mandaruk</i> 8 th DAY		2.15			
<i>Mandaruk</i> 15 th DAY		2.10			
<i>Mandaruk</i> 30 th DAY		2.05			
<i>Galaragtva</i> BT	31	4.74	111.360	<0.001	Significant
<i>Galaragtva</i> 1 st DAY		4.13			
<i>Galaragtva</i> 8 th DAY		2.39			
<i>Galaragtva</i> 15 th DAY		1.94			
<i>Galaragtva</i> 30 th DAY		1.81			
<i>Galoparodha</i> BT	31	4.73	102.771	<0.001	Significant
<i>Galoparodha</i> 1 st DAY		3.82			
<i>Galoparodha</i> 8 th DAY		2.23			
<i>Galoparodha</i> 15 th DAY		2.11			
<i>Galoparodha</i> 30 th DAY		2.11			
Jugulo-digastric lymphadenopathy BT	31	4.63	100.602	<0.001	Significant
Jugulo-digastric lymphadenopathy 1 st DAY		3.94			
Jugulo-digastric lymphadenopathy 8 th DAY		2.40			
Jugulo-digastric lymphadenopathy 15 th DAY		2.05			
Jugulo-digastric lymphadenopathy 30 th DAY		1.98			



Table: 3 Showing effect of Yavakshara pratisarana on Objective parameters by applying Paired t Test

Parameter	Mean		Paired Difference					Remark
	BT±SD	AT±SD	Mean Difference	SD	SE	't' value	'P' value	
ESR	8.958	5.661	12.910	7.472	1.342	9.620	.000	S
TC	2277.671	1308.278	-93.548	1992.475	357.859	-.261	.796	NS
HB	1.522	1.249	-.110	.110	.190	-.579	.567	NS

Fig no – 01



Fig No : 05 Before treatment on 0th day



Fig No: 06 After treatment on 30th day