

Experimental Evaluation of Talisadi Suspension for Anti-Histaminic and Anti-Inflammatory Activities in Animal Models

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Abstract

Talisadichoorna is a routinely used formulation among ayurvedic practitioner in disorder of *Pranavaha*, *Annavaha* and *Rasavahastrotasvyadhi*'s. As *choorna* has some drawbacks, as a dosage forms *talisadichoorna* was converted into a modern dosage form i.e. suspension. It is better than *choorna* in aspects like ease in administration, longer shelflife and faster absorption. Standard Operating Procedure was followed for its preparation. No work was reported regarding its pharmacological action except for anti microbiological study. This study aimed to assess its anti inflammatory and antihistaminic actions, which is clinically seen. This study helped in assessing mode of action of the formulation. The disease *Tamak shwas* can be correlated with Bronchial Asthma on the basis of pathology, signs and symptoms. Bronchial Asthma is characterised by dyspnoea, excessive cough, wheeze, chest tightness etc caused by airway inflammation and increase bronchial responsiveness. To study antiinflamtoamry activates model selected was "Granuloma pouch model" using rats as experimental animals. To study antihistaminic activity experimental animal guinea pig was used and model used was "Protection against histamine induced brochospasm model". It was evident that Talisadi Suspension exhibit significant anti-inflammatory and antihistaminic activities.

Keywords: *Talisadi Choorna [TC], Anti-Histaminic study, Anti-inflammatory study, Tamak Shwas, Bronchial Asthma, Talisadi Suspension [TS].*

Introduction

The branch of Ayurveda which deals with preparation of medicines is called as Bhaishajya Kalpana. It does not appear as a separate branch in Ashtang Ayurveda¹ yet it is the backbone of ayurvedic science. It is inexistence since time immerioaland is flourishing till date. References from primitive era and Vedic period² elaboratemaking of different dosage forms and formulations along with its usage in different disease conditions. Sharangdhar samhita³ in 14 th century for the first time compiled various formulations and explained their manufacturing process in detail. Hence it can be termed as the first book of Ayurvedic pharmaceuticals and pharmalogy. Twenty five different dosage forms such as sneha, parpatikalpa,

choorna, asavaaristha, khalvirasakalpa etc are in routine use.

These are mainly derived from basic dosage forms i.e. panchvidh kashayakalpana and formulated by applying the different principles of ayurvedic pharmaceuticals of natural drugs. In modern era by adopting newer techniques and with the application of principles of ayurvedic pharmaceutical science one can develop various formulations and new dosage forms having longer shelf life, better palatability and ease in administration.

With this view, work was carried out previously in the department of RSBKV, BVDU, Pune for a routinely

used and effective formulation i.e. Talisadi Choorna⁴ and a standard operating procedure was developed to change the dosage form to prepare Talisadi Suspension⁵. There are various formulations under the name of Talisadi Choorna wherein some variations in its ingredients are noticed. To prepare suspension the contents must disperse in water and it should be possible to collect its extracts. As Vansshlochan, one of the ingredients does not fulfil this parameter; the formulation which does not contain vanscholana was selected to prepare talisadisuspension. Talisadi suspension has many benefits over choorna, discussed as follows;

- Its shelf life is longer than choorna
- It is easy to administer in all (children and elderly)
- More absorbent and ease in dosage calculation, since in liquid form
- It is palatable
- Choorna may clog the trachea sometimes, which is not with the suspension.

Talisadichoorna possesses actions like deepen (stomachic), Pachan (digestive), Rochan (relishing)⁶ and it is very frequently used in the management of Kaas (Cough), Shwas (Asthma), Pandu (Anemia), Jwar (Pyrexia), Chardi (Emesis), Atisaar (diarrhoea). Thus we can say choorna is a drug of choice in the treatment of various respiratory diseases including Tamakshwaas

Tamakshwaas is a disease of Pranavaha Strotas described in all the basic text of Ayurveda that can be correlated with Bronchial Asthma, which is a chronic inflammation of bronchioles causing narrowing and hence obstruction of air passage. This leads to difficulty in breathing. Thus activities that mark improvement in bronchial asthma are anti-inflammatory and mast cells stabilisation⁷.

To generate evidence of activities of talisadichoorna, animal experiments were carried out in the department. Studies regarding Anti-inflammatory^{8&9} and Antihistaminic^{8&9} activities of talisadichoorna containing natural⁸ and synthetic⁹ Vanscholana have been completed in which it was evident that TC possesses Anti-inflammatory and Anti-histaminic activities. Talisadi suspension has been tested only for its stability¹⁰ and anti-microbial activity. No further work was done.

Need of Study: As anti-histaminic and anti-inflammatory of the formulation in its suspension form

has not been studied. Hence it was proposed to study these two activities of talisadi suspension and validate whether this modified dosage form possesses same mode of action as choorna or change in dosage form will affect its action.

Aim and Objectives: Aim: To study antihistaminic and anti-inflammatory activities of Talisadi Suspension in Experimental Animals.

Objectives:

- To prepare Talisadi Suspension by following SOP
- To assess antihistaminic activity of Talisadi Suspension on Guinea pigs
- To assess the anti-inflammatory activity of Talisadi Suspension on Rats.

Material and Methodology

Preparation of Talisadi Suspension⁵: To prepare Talisadi Suspension, Standard Talisadi Choorna⁴ was taken of 10 mesh size and Excipients Carboxyl Methyl Cellulose Sodium Salt (CMC), Methyl Paraben (MP) Pharmaceutical grade and Propyl Paraben (PP) Pharmaceutical grade was taken.

For 100 ml of Talisadi Suspension with concentration 2 gm TC per 10 ml suspension

- 95 ml freshly collected sterile distilled water was taken in sterile conical flask.
- 250 mg (0.25 %) CMC was dissolved in distilled water by constant agitation with glass rod at room temperature.
- 20 grams of TC was added to this solution and shook properly till all the particles were dispersed uniformly.
- MP and PP (0.2 gm each) were dissolved in 5 ml of DW and the solution was mixed to above suspension. These are preservatives used in the suspension.
- This TS was then packed in bottles.

Organoleptic tests: On preparing the suspension it was tested for its organoleptic characters and was found to be standard as it was identical with that of previous.

- Taste: Sweet, Pungent
- Odour: Aromatic
- Consistency: Turbid

- Colour: Light brown
- Redispersion pattern: Particles Redispersed easily
- Viscosity: 4500CPs

Experimental Studies: Permission from ethical committee was taken before starting the animal experiments.

Antihistaminic study¹¹:

- Animal used for study: Guinea pig¹²
- Animal model used for study: Histamine Induced Bronchospasm

The study was conducted at Department of Pharmacology BVU medical college, Pune. Total 12 animals were used for study. 2 groups each of 6 animals was made, 6 for test drug and other 6 as control group. Adult male guinea pigs were used of 250-300gms. As per recommended adult dose of 10ml/day suspension in human beings the drug dose¹² was extrapolated in animals.

Methodology¹³: To study anti histaminic activity Guinea Pigs were pre-treated for 21 days with single dose of test and control drug orally. Daily care of animal was taken. On 2nd day animals were subjected to Histamine Aerosol challenge and time required to produce pre-convulsive dyspnoea [PCD] was noted.

Anti-inflammatory study¹²

Animal used: Rat¹²

Animal model used: Cotton Wool Granuloma¹⁴: The study was conducted at Department of Pharmacology BVU medical college, Pune in collaboration with Jawaharlal Nehru Medical College, Datta Meghe Institute of Medical Sciences. Total 12 animals were used for study. 2 groups each of 6 animals was made, 6 for test drug and other 6 as control group. Adult male Wistar Rats were used of 200-300gms. As per recommended adult dose of 10ml/day suspension in human beings the drug dose¹² was extrapolated in animals.

Table 1: Extrapolation of Dose in Rats

Group	For 70kg man in 24 hrs	Dose calculating factor	For 200mg Rat	For 1kg Rat
Talisadi suspension	10ml	0.181	1.81ml	9.05ml

Table 2: Dose calculation for Rat:

Group	Test drug	No. of Animals	Dose calculation in ml
A	Talisadi Suspension	6	Wt. of animal x 0.00905
B	Base of suspension	6	Wt. of animal x 0.00905

Methodology¹⁴: Wistar Rat of average wt of 200 gm was anaesthetised and back skin was shaved and disinfected. Incision was made in lumbar region and subcutaneous tunnel was formed. Sterile cotton pellet of 10mg was placed and sutured back. Inflammation took place and granuloma pouch was formed at incision site. Animals were treated with test drug orally for 7 days. On 8th day animals were sacrificed and granuloma pouch were removed, weighed and then dried at 400°C for 24hrs and weighed till constant weight was obtained.

Observations and Results

Anti- Histaminic activity:

Table 3: Time required for PCD

Group	Animal marking	Time required in sec
A. Experimental	Head	24.4
	Back	24.57
	Tail	25.67
	Right fore limb	27
	Left fore limb	24.65
	Right hind limb	32.85

Group	Animal marking	Time required in sec
B. Control	Head	20.99
	Back	19.22
	Tail	13.41
	Right fore limb	22
	Left fore limb	18.3
	Right hind limb	20.36

Result

Table 4: Values obtained on applying unpaired t-test

Sr. No.	Group	Mean	SD	T table	T cal	P value
1.	Group A	26.5233	2.9669	-4.03	-15.25	0.0000109
2.	Group B	19.0466	2.7863			

When mean of time taken for Pre Convulsive Dyspnoea was compared between control and Talisadi Suspension group by unpaired t-test at 1% level of significance. P value calculated was less than 0.01 which denotes significance difference between mean. Thus it was interpreted that Talisadi Suspension is effective against histamine induced bronchospasm.

Anti-inflammatory activity:

Table 5: Weight of Wet and Dried Granuloma

Group	Animal	Prior weight of granuloma pouch [mg]	Final weight of dried granuloma pouch [mg]
Talisadi Suspension	RP1	227	42.3
	RP2	199	42.6
	RP3	240	44
	RP4	195	47.3
	RP5	244	38.1
	RP6	395	35.8
Control	RQ1	245	53.5
	RQ2	284	47.8
	RQ3	275	54.9
	RQ4	248	57.6
	RQ5	191	50
	RQ6	181	62

Result

Table 6: Values obtained on applying unpaired t-test

Sr. No.	Group	Mean	SD	T table	T cal	P value
1.	Group A	41.6833	3.77	2.57	5.13	0.0018
2.	Group B	54.3	4.688			

When mean weight of dried granuloma was compared between control and Talisadi Suspension group by unpaired t-test at 1% level of significance. P value calculated was less than 0.01 which denotes significance difference between mean. Thus it was interpreted that Talisadi Suspension is effective as an anti-inflammatory agent.

Discussion

Talisadichoorna is one of the widely used formulations among Ayurvedic community. However it has some drawbacks found through experimental studies and to overcome such deficiencies it was converted into talisadi suspension. TS was tested in animal models to check activities i.e. anti-histaminic and inflammatory to study antihistaminic activity the model used was protection against histamine induced brochospasminguineapigs. The result showed that TS has antihistamicactivity. To study anti-inflammatoryactivity, model used was granuloma pouch model in rats. The result showed that TS has anti-inflammatory activity.

Conclusion

It was possible to prepare similar quality of TS by following SOP of previous study. TS matched the standard parameter from the observation recorded in the experiment carried out. It can be concluded that mode of action of TS is anti-inflammatory and antihistaminic. Talisadi Suspension works on the same mechanism as that of Talisadi Choorna. Absence of vanscholchan does not hamper the activity of formulation.

Ethical Clearance: Taken from institutional ethics committee.

Source of Funding: Self.

Conflict of Interest: Nil.

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