

## Vacha (*Acorus calamus*) as an Ayurvedic Premedicant

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**ABSTRACT :** Previously many indigenous herbal drugs mentioned in Ayurvedic literature were experimentally screened on the animals and were also studied clinically on the patients as pre-anesthetic medication drug such as Brahmi, Sankhapushpi, Mandukparni, Jatamansi etc. Modern research workers had also proved their usefulness in the treatment of nervous and mental diseases. In the same chain of research work, Vacha was selected for this study and was used in the form of Ghanasatva. The clinical trial was carried on 40 healthy patients. The patients were divided into two groups randomly. The control and trial groups included 20 patients each of narrow age and weight distribution. The patients of group I (Control) were premedicated with Inj. Glycopyrrolate 0.2 mg IM and Tab. Phenergan 50 mg orally with one ounce of plain water. The patients of group II (Trial) were premedicated with Inj. Glycopyrrolate 0.2 mg I.M. and Vacha (Ghansatva) orally in recommended doses with one ounce of plain water 90 minutes prior to induction of anaesthesia. A standard anesthetic technique with pre oxygenation for 3 minutes & Nitrous oxide with Ether inhalation by spontaneous ventilation with Maggill's open circuit (Boyle's apparatus) was used. The following parameters were used to see the efficacy of the drug : Psychophysical effect before induction of anaesthesia, Cardio-respiratory and other reflex response during the course of subsequent anaesthesia & Post operative sickness in immediate post operative period up to two hours. On the basis of observations, it was concluded that Vacha controls the raised body temperature, produces good sedation and it may be helpful in the patients with preexisting hyperthermia. It does not produce any C.V.S. & Respiratory depression.

**Key word :** Medhya, Phenergan, Glycopyrrolate, sedation, apprehension and induction.

### INTRODUCTION

Vacha<sup>1</sup> - the drug under clinical study is being used since long in Ayurvedic practice<sup>2</sup> for the treatment of psychic disorders. Recently many works have been done on Medhya,<sup>3,4,5,6</sup> drugs e.g. Brahmi, Shankhapushpi, Ashwagandha etc. for the management of psychic disorders. Neuro-Pharmacological action of Vacha oil revealed its sedative, tranquilizing action<sup>7</sup> in rats, mice, cats and dogs (Dhala and Bhattacharya, 1968). It inspired us to carryout a clinical study on Vacha Ghanasatva in the field of Sangyahan to explore an Ayurvedic premedicant<sup>8,9,10</sup>.

Now a day the clinical trail of drugs has increased many fold<sup>11</sup>. The most important support in favour of the clinical trial is to confirm the observations and claims made by previous workers<sup>12, 13, 14, 15, 16, 17</sup> in their experimental studies and also to find out any additional action and side effects which were some times not observed in experimental study but are observed in human being only. Therefore we planned to conduct a study on the efficacy of Vacha as premedicant.

### Aims and Objectives :

The aim of this study was to explore the possibility to provide a safe and effective Ayurvedic premedicant.

Till date many works had been done but no ideal premedicant is in hand.

### MATERIAL AND METHODS

The crude drug (Vacha rhizome) was collected from Ayurvedic Pharmacy, Institute of Medical Sciences, Banaras Hindu University, Varanasi and its validity was confirmed by Dravyaguna Department. Coarse powder (churna) was prepared from Vacha rhizome-dried completely under shade.

The preparation of Ghanasatva was completed in two steps. In first step, one kg of Vacha rhizome churna was mixed with 8 liters of water and boiled. When one-eighth of the initial content remained, it was filtered. Thus a decoction was prepared. In the second step, the decoction was boiled again to change its form from liquid to semisolid. Then dried under shade and thus the required Ghanasatva was prepared. The complete procedure was done in the Ayurvedic Pharmacy. I.M.S., B.H.U.

### Determination of the Dose of Drugs :

The dose for clinical study was calculated according to the dose of churna recommended for vacha in Ayurvedic literature by various authors. For an adult weighing - 40-60 kg, the dose of the drug was calculated according to yield of Ghanasatva, as bellow :

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Name of the drug	Amount of Churna	Obtained Ghanasatva	Presence of Ghanasatva in 1 gm Churna	Recommended dose of Churna	Recommended dose of Ghanasatva
Vacha ( <i>Acorus calamus</i> )	1 kg	100 gm	100 mg	500-1000 mg	100 mg

#### Grouping of the patients & Inclusion criteria :

Forty patients with a narrow age and weight difference scheduled for elective surgery were taken for the study and were randomly divided into two groups consisting of 20 patients in each group.

The patients were examined before giving premedication to ensure that no pathological conditions existed which could influence the various parameters of this study. The drugs were given 60-90 minutes before operation.

**Group I :** The patients of control group I received inj. Glycopyrrolate 0.2 mg IM and Tab. Phenergan (Promethazine hydrochloride), 50 mg with an ounce of water 90 minutes before anaesthesia.

**Group II :** The patients of group II (trial group) received inj. Glycopyrrolate 0.2 mg IM and cap. Vacha ghanasatva 100 mg with an ounce of water 90 minutes before induction of anaesthesia.

Before giving the premedication, the B.P., P.R., R.R., Temperature, G.C., C.V.S., R.S., G.I.T. were checked and recorded on a proforma. After 90 minutes of administration of the drugs, the effects achieved were also recorded before induction of anaesthesia in calm and quiet surroundings. For recording the effects, a cyclostyled Proforma was employed, so that none of the planned

observations could be missed. For evaluation of desirable and undesirable effects of the pre-medicaments, an assessment of the following signs and symptoms was made by the investigator himself.

#### Exclusion criteria :

The following classes of patients were excluded from the study :

1. Those who were beyond the range of 18 to 50 years of age.
2. Those who were beyond A.S.A. GP. 1 & 2.
3. Those who were pregnant.
4. Patients suffering from respiratory, cardiac, hepatic, renal, disorders, sensitive to aspirin, diclofenac sodium, bleeding disorders and peptic ulcer.

#### The trial drug was clinically studied in following three stages -

1. Psychophysical effect in pre-anaesthetic period before induction of anaesthesia.
2. Cardio-respiratory and other reflex responses during the course of subsequent anaesthesia.
3. Post-operative sickness in immediate post-operative period up to two hours.

### OBSERVATIONS & RESULTS

TABLE NO. 1 : GROUPING OF PATIENTS :

Groups	Number of Patients	Premedication Drugs
Control (I)	20	Inj. Glycopyrrolate 0.2 mg IM and Tab. Phenergan ( Promethazine hydrochloride) - 50 mg. with an ounce of water 90 minutes before anaesthesia.
Trial (II)	20	Inj. Glycopyrrolate 0.2 mg IM and cap. Vacha ghanasatva 100 mg with an ounce of water 90 minutes before induction of anaesthesia.

TABLE NO. 2 : COMPARISON OF MEAN AGE AND WEIGHT :

	Group I	Group II	Statistical Comparison		
			t	p	Remark
Mean age (years)	27.45 ± 8.17	27.1 ± 9.19	0.127	>0.05	N.S.
Mean weight (kg)	49.67 ± 5.02	50.05 ± 4.08	0.263	>0.05	N.S.

Age and Weight was identical.

**TABLE NO. 3 : EFFECTS ON PULSE RATE CHANGES PER MINUTE :**

Group	Before premedication (A)	After premedication (B)	Statistical Comparison		
			t	p	Remark
Group I	80.55 ± 8.69	88.06 ± 8.48	2.76	>0.01	Significant
Group II	79.05 ± 9.01	86.75 ± 9.03	2.49	>0.01	Significant

The rise in mean pulse rate, observed within the both groups were found statistically significant.

**TABLE NO. 4 : EFFECTS ON BLOOD PRESSURE CHANGES (M.B.P.):**

Group	Before premedication (A)	After premedication (B)	Statistical Comparison		
			t	p	Remark
Group I	87.45 ± 2.87	87.5 ± 2.91	0.054	>0.05	N.S.
Group II	88.4 ± 3.76	88.5 ± 3.51	0.086	>0.05	N.S.

A negligible rise in the mean of M.B.P. in group I and group II, 90 mnts after premedication carries no value.

**TABLE NO. 5 : EFFECTS ON RESPIRATORY RATE CHANGES (PER MINUTE) :**

Group	Before premedication (A)	After premedication (B)	Statistical Comparison		
			t	p	Remark
Group I	16.3 ± 2.02	16.4 ± 1.50	0.177	>0.05	N.S.
Group II	16.85 ± 1.49	17.2 ± 1.93	0.640	>0.05	N.S.

Change in respiratory rate was found insignificant at both the levels.

**TABLE NO. 6 : EFFECTS ON BODY TEMPERATURE CHANGES (OF) :**

Group	Before premedication (A)	After premedication (B)	Statistical Comparison		
			t	p	Remark
Group I	98.0 ± 0.36	98.29 ± 0.30	2.90	>0.01	Significant
Group II	98.28 ± 0.32	98.43 ± 0.25	1.68	>0.05	N.S.

The rise in mean temperature after premedication level in both the groups were 0.29 and 0.15 respectively, which were statistically significant in group I and insignificant in group II when compared within the groups.

**TABLE NO. 7 : DESIRABLE AND UNDESIRABLE EFFECTS :**

	Incidence	Group I		Group II		Z value
		Freq.	%	Freq.	%	
<b>Desirable Effects</b>						
Sedation	Present	16	80	18	90	0.89
	Absent	4	20	2	10	
Lack of Apprehension	Present	17	85	19	95	1.072
	Absent	3	15	1	5	
Absence of Excitement	Present	18	90	20	100	1.490
	Absent	2	10	0	0	
<b>Undesirable Effects</b>						
Dizziness	Present	3	15	2	10	0.47
	Absent	17	85	18	90	
Vomiting	Present	0	0	0	0	0.0
	Absent	20	100	20	100	
Nausea	Present	0	0	0	0	0.0
	Absent	20	100	20	100	

**TABLE NO. 8 : MEAN INDUCTION TIME (IN MINUTES) :**

Group	Mean induction time (mnts)	Statistical Comparison		
		t	p	Remark
Group I	5.42 ± 1.19	0.86	>0.05	N.S.
Group II	4.5 ± 1.05			

The difference in mean induction time between these two groups was found insignificant.

**TABLE NO. 9 : MEAN RECOVERY TIME (IN MINUTES) :**

Group	Mean recovery time (mnts)	Statistical Comparison		
		t	p	Remark
Group I	6.24 ± 1.54	1.37	>0.05	N.S.
Group II	5.68 ± 0.98			

The difference of mean recovery time is statistically insignificant.

**TABLE NO. 10 : NATURE OF RECOVERY :**

Nature of Recovery	Group I		Group II		Z value
	Freq.	%	Freq.	%	
Fully awake	14	70	17	85	1.46
Not awake but safe	6	30	3	15	
Not awake not safe	0	0	0	0	

The Nature of recovery is statistically identical.

## DISCUSSION

Age and Weight is found identical in the study. The rise in mean pulse rate/mnt, observed within the both groups (>0.01) as found statistically significant. A negligible rise in the mean of M.B.P. in group I and group II, 90 mnts after premedication carries no value (>0.05). The psycho-physical response was evaluated 90 minutes after premedication in both the group. With regard to production of desirable effects both the groups were identical but the percentage was little higher in Vacha premedicated group, without producing any undesirable responses.

Vacha as premedicant helped in rapid induction of anaesthesia by reducing the induction time (4.5 ± 1.05). The total anaesthetic requirement was also reduced. The percentage of smooth induction was found higher in trial group. Post operative recovery from anaesthesia was quicker after Vacha (5.68 ± 0.98) than Phenergan (6.24 ± 1.54) premedication.

## CONCLUSION

On the basis of observation it can be concluded :

1. Vacha has capability to produce good sedation and allaying of apprehension.
2. Vacha controls the raised body temperature induced by Glycopyrrolate. It may be helpful in the patients

with pre-existing hyperthermia due to its sweat inducing property.

3. It is useful for quick and smooth induction.
4. It is a better drug for allaying apprehension than Phenergan.
5. Incidences of complications during anaesthesia were also less.
6. It does not produce any cardiovascular and respiratory depressant action.

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## हिन्दी सारांश

### वचा एक आयुर्वेदिक संज्ञाहरण पूर्व औषधि

डी. एन. पाण्डे एवं एस. के. मिश्रा

संज्ञाहरण पूर्व कुछ औषधियाँ संज्ञाहरण को सुगम बनाने हेतु दी जाती हैं। इसी क्रम में मेध्य औषधियों का प्रयोग संज्ञाहरण प्रभाग में किया गया। इस क्रम में वचा का चयन संज्ञाहरण पूर्व औषधि हेतु किया गया तथा ४० रोगियों में इसके प्रभाव का अध्ययन किया गया। इन रोगियों में वचा एक उपयुक्त संज्ञाहरण पूर्व औषधि सिद्ध हुई। इससे शारीरिक तापक्रम पर नियन्त्रण पाया गया तथा संज्ञाहारक औषधियों के साथ कोई विरुद्ध प्रतिक्रिया नहीं पायी गयी।

गुजरात आयुर्वेद युनिवर्सिटी