

Clinical Efficacy of *Kashyapokta Virechan Yoga* & *Nagbala ghritam* in Long-Term Health Hazards of Pesticides

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ABSTRACT

Chemical or biological substance designed to kill or retard the growth of pests that damage or interfere with the growth of crops, shrubs, trees, timber and other vegetation desired by humans. Now a day, the utilization of pesticides, fungicides, food, preservatives and cosmetics etc, are continuously increasing day by day which causes physical and mental hazards effect on human being. Pesticide compounds are well absorbed through the mucous membrane of GI tract, respiratory tract and through the skin. Signs & Symptoms of long-term or chronic illness from pesticides are weight loss, constant weakness, numbness in hands or feet, poor balance, skin irritation, loss of vision, very fast or very slow heartbeat, sudden mood changes, confusion, memory loss, and trouble concentrating in general. [1] According to *Sushruta*, *visha* which on a constant exposure to a particular time, place and diet as well as constant and regular day-sleep tends to vitiated the *dhatu*s of the body and this poison is consequently known as the *dushi visha*. [2] As per the definition any substance which has properties of *visha* and that which is detrimental to the tissue elements on aggravation in favorable condition can be considered as *dushi visha*. Hence there is need to evaluate, elaborate, and description of long term hazards of chemically composed pesticide in view of Ayurvedic aspect. In first step the chronic pesticide exposed hundred patients has observed for evaluation of *dosha*, *dushya*, and *srotodusthi*. In second step chronic pesticide exposed twenty patients has selected for clinical study among from survived hundred patients.

Keywords: Pesticides, *Dushivisha*, *Kiririm Vishas*

INTRODUCTION

Due to rapid industrialization, changing atmosphere, and consuming different kind of *gara visha* through food, water, air, soil etc. At the same time, Due to irregular dietary habits, sedentary lifestyle, exposure to different food combinations (*viruddha Aahar*) interfere in the digestive power of a person and due to all these factors, the *jathargni* become weak, which even cannot be able to digest light food particles thus giving rise to *Aamavisha* which stay remain in our body can be

labeled as *dushivisha* on long term exposure which reduce our immunity. [3] In *ayurveda* the description of about the *kiririm vishas* has found details, even the natural pesticide *Tuthya* has also found in the text book of *ayurveda* but chemically pesticide like organophosphorus, organochlorin, carbamates is not found in text book of *ayurveda* as it has evaluated in nineteen centuries. Along with green revolution the use of pesticide is increased in all over world including India. Hence long term of hazards of pesticide has also found in

increased day by day. Hence there is need to evaluate, elaborate, and description of long term hazards of chemically composed pesticide in view of Ayurvedic aspect. In first step the chronic pesticide exposed hundred patients has observed for evaluation of *dosha*, *dushya*, and *srotodusthi*. In second step chronic pesticide exposed twenty patients has selected for clinical study among from survived hundred patients. The facts established by careful investigations, observations and experiments supported by accurate clinical data and convincing reasoning can satisfy today's science about the scientific validity of *Ayurveda*.

AIMS & OBJECT

1. To study the Clinical efficacy of *Kashyapokta Virechan Yoga & Nagbalaghritam* in long-term health effects of pesticides in the patient having history of chronic exposure of Pesticides.
2. To evaluate, elaborate, and discuss the long term hazards of chemically composed pesticide in view of Ayurvedic aspect

MATERIALS & METHODS

1. Survey Study-

Approximately 100 Farm Labors who having history of chronic exposure of Pesticides during spraying in the field were selected for study and health hazards were evaluated clinically. The survey has held randomly in Jaipur Rural Area and Questionary for the survey were prepared which was mentioned in proforma.

2. Selection of cases

20 patients of long-term health effects of pesticides having history of chronic exposure of Pesticides were selected from survey and registered in NIA OPD for clinical study after written consent. Health hazard were evaluated before & after clinical study.

3. Dose of Drugs:-

(A) *Kashyapokta Virechan Yoga* 5 gm with lukewarm water, after meal, bed times in a day for 30 days.

(B) *Nagbalaghritam* 10mg BD with lukewarm water, for 30 days.

Duration of clinical trial – 30 days, Follow up – 15 days.

4. ASSESSMENT CRITERIA

Assessment of effect of the therapy has been done on the basis of the following subjective and objective criteria:

Subjective parameter-

The following sign and symptoms of long term hazards of pesticide were assessed for any improvement after the course of therapy. Loss of appetite, Trouble sleeping, Constipation, Memory loss, Anxiety, Weakness, Chronic fatigue, Weight loss, Headache, Itching skin, Skin rashes, Trouble concentrating.

Objective parameters (laboratory profile):

For the purpose of diagnosis of disease its assessment, severity, clinical improvement and to assess the possible side effects, certain routine and specific investigations were performed in every patients viz.

Haematological Investigations:

Haemoglobin (Hb%), Total Leucocytes Count (TLC), Differential Leucocytes Count (DLC), Erythrocyte Sedimentation Rate (ESR), Liver function test- Serum bilirubin direct, serum bilirubin total, serum protein, SGOT, SGPT.

OBSERVATIONS

The status of registered patients and the results obtained during clinical study in the signs and symptoms of the registered Patient were assessed and statically before and after treatment. Observations made during the course of study are presented as follows:

TABLE – 1 AGE WISE DISTRIBUTION OF 20 PATIENTS OF CHRONIC PESTICIDE EXPOSED (LONG TERM HAZARDS OF PESTICIDES)

Age in years	Male	Female	Total	Percentage
20-35	8	0	8	40%
36-50	10	0	10	50%
51-60	2	0	2	10%

Majority of patients were belong to age group 36-50 years (50%) followed by 20-35 Years (40%) and only 10% patient were found 51-60 age group.

TABLE – 2 RELIGION WISE DISTRIBUTION OF 20 PATIENTS OF CHRONIC PESTICIDE EXPOSED (LONG TERM HAZARDS OF PESTICIDES)

Religion	No. of patient	Percentage
Hindu	18	90%
Muslim	2	10%

The data shows that majority of patients were Hindu (50.00%) followed by Muslim (10.00%).

TABLE – 3 EDUCATION WISE DISTRIBUTION OF 20 PATIENTS OF CHRONIC PESTICIDE EXPOSED (LONG TERM HAZARDS OF PESTICIDES)

Education	No. of patient	Percentage
Illiterate	1	5%
Primary	7	35%
Middle	11	55%
Secondary	1	5%

The data shows that majority of patients were middle (55.00%) followed by primary(35.00%).

TABLE – 4 INCIDENCE OF SOCIO-ECO.STATUS

Status	No. Of patients	Percentage
Lower	13	65%
Middle	5	25%
Rich	2	10%

In the present study maximum number of patients i.e. 13 patients (65%) were of lower socioeconomic status followed by 5 patients (25%) were from middle socioeconomic status.

TABLE – 5FOOD HABITS WISE

Food habits	No. of patient	Percentage
Vegetarian	15	75%
Mixed	5	25%

The data shows that majority of patients were Vegetarian (75.00%) followed by mixed (25.00%).

TABLE-6 NIDRA WISE DISTRIBUTION

Nidra	No. of patient	Percentage
Samyaka	7	35%
Alpanidra	13	65%
Atinidra	0	0%

The above table indicates that 35% patients reported *Samyaka nidra*, while 65% of patients were having *Alpanidra*.

TABLE No. 7 AGNI WISE DISTRIBUTION

Agni	No. of patients	Percentage
Sama	5	25%
Visama	1	5%
Tiksna	0	0%
Manda	14	70%

Majority of patients 70% were having *Mandagni*, whereas 5% patients having *Vishmagni*.

TABLE – 8 ADDICTION WISE DISTRIBUTION OF 20 PATIENTS OF CHRONIC PESTICIDE EXPOSED (LONG TERM HAZARDS OF PESTICIDES)

Addiction	No. of patients	Percentage
Alcohol	2	10%
Tobbaco/ Jarda-gutka	6	30%
Smoking	12	60%
Total	20	100%

The above table reveals that maximum number of patients 60% were having addiction of smoking respectively. 30% patients were having habit of tobacco chewing. 10% patients were found to have alcohol addiction of above things.

TABLE-9 KOSHTHA WISE DISTRIBUTION

Koshtha	No. of patients	Percentage
Kroora	8	40%
Madhya	11	55%
Mridu	1	5%
Total	20	100%

Among 20 patients of long term hazards of pesticide, maximum number of patients i.e. 11 (55%) were having *Madahyama Koshtha*, 08 patients (40%) were having *Kroora Koshtha*.

TABLE-10 BOWEL HABIT DISTRIBUTION

BOWEL	No. of patients	Percentage
Regular	6	30
Irregular	14	70
Total	20	100

Among 20 patients of long term hazards of pesticide, maximum number of patients i.e. 70% were having irregular bowel habit, 30 % patients were having regular bowel habit.

TABLE 11- SATVA WISE DISTRIBUTION

Satva	No. of patients	Percentage
Pravara Avara	0	0%
Madhyama	11	55%
Avara	9	45%
Total	20	100%

Among 20 patients of long term hazards of pesticide, 11 patients (55%) were had *Madhyama Satva* and 09 patients (45%) had the *Avar Satva*

TABLE 12 AAHARA SHAKTI WISE DISTRIBUTION

AAHARA SHAKTI	No. of patients	Percentage
1. Abhyavaharana Shakti (Matra)		
Pravara	5	25%
Madhyama	2	10%
Avara	13	65%
2. Jarana Shakti (Kala)		
Pravara	1	5%
Madhyama	4	20%
Avara	15	75%
Total	20	100%

Majority of the patients i.e. 13 (65%) patients were of *Avara Abhyavaharana Shakti (Matra)*, *Madhyama* and and 2 patients (10%) having *Madhyama Abhyavaharana Shakti*, while 25% patient were of *pravara Abhyavaharana Shakti*. Majority of the patients i.e. 15 (75%) patients were of *Avara Jarana Shakti* and 20% *Madhyama Jarana Shakti*.

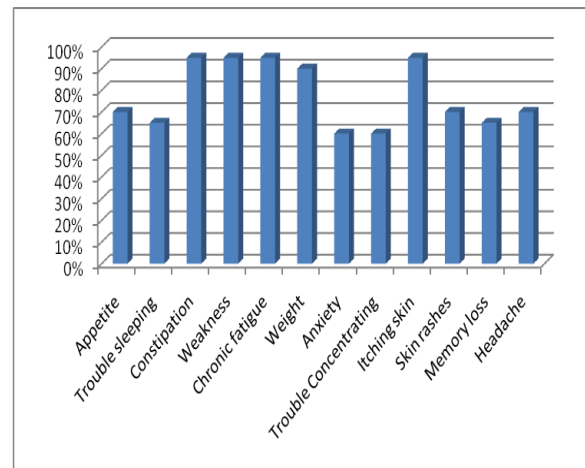
TABLE NO.-13 SHOWING THE 'INCIDENCE OF VYAYAMA SHAKTI' IN 20 PATIENTS OF CHRONIC PESTICIDE EXPOSURE

S.N.	Vyayama Shakti	No. of Patients	Percentage
1.	Pravara	01	5
2.	Madhyama	8	40
3.	Avara	11	55
TOTAL		20	100

It was observed that out of 20 patients of chronic pesticide exposure, 11 patients (55%) had *Avara Vyayama Shakti* while 08 patients (40%) had *Madhyama Vyayama Shakti*. 1 patient(5%) were having *Pravara Vyayama Shakti*.

TABLE No. 14 SIGNS AND SYMPTOMS REPORTED BY 20 PATIENTS OF CHRONIC PESTICIDE EXPOSED (LONG TERM HAZARDS OF PESTICIDES)

S. N.	Symptoms	No. of Patients	Percentage
1.	Appetite	14	70%
2.	Trouble sleeping	13	65%
3.	Constipation	19	95%
4.	Weakness	19	95%
5.	Chronic fatigue	19	95%
6.	Weight loss	18	90%
7.	Anxiety	12	60%
8.	Trouble Concentrating	12	60%
9.	Itching skin	19	95%
10.	Skin rashes	14	70%
11.	Memory loss	13	65%
12.	Headache	14	70%



Among 20 patients of long term hazards of pesticide, maximum 19 patients (95%) were having constipation, weakness, itching skin and chronic fatigue ;18 patients (90%) weight loss; 14 patients (70%) were having loss of appetite, skin rashes and headache;13 patients(65%) were having complaint of insomnia, memory loss, 12 patients (60%) were having complaint of Trouble Concentrating and anxiety.

RESULTS

For Nonparametric Data Wilcoxon matched-pairs signed ranks test is used while for Parametric Data Paired 't' Test is used and results Calculated.

1) Subjective Improvement

There was marked improvement in the feeling of well being, physical and mental fitness was in the patients.

2) Improvement in objective parameters:

The various laboratory investigation before and after treatment was assessed statistically. According to that, results have been made.

For the calculation of statistical values in the following tables, following abbreviation is being used:

H.S. = Highly Significant

V.S. = Very Significant

S. = significant

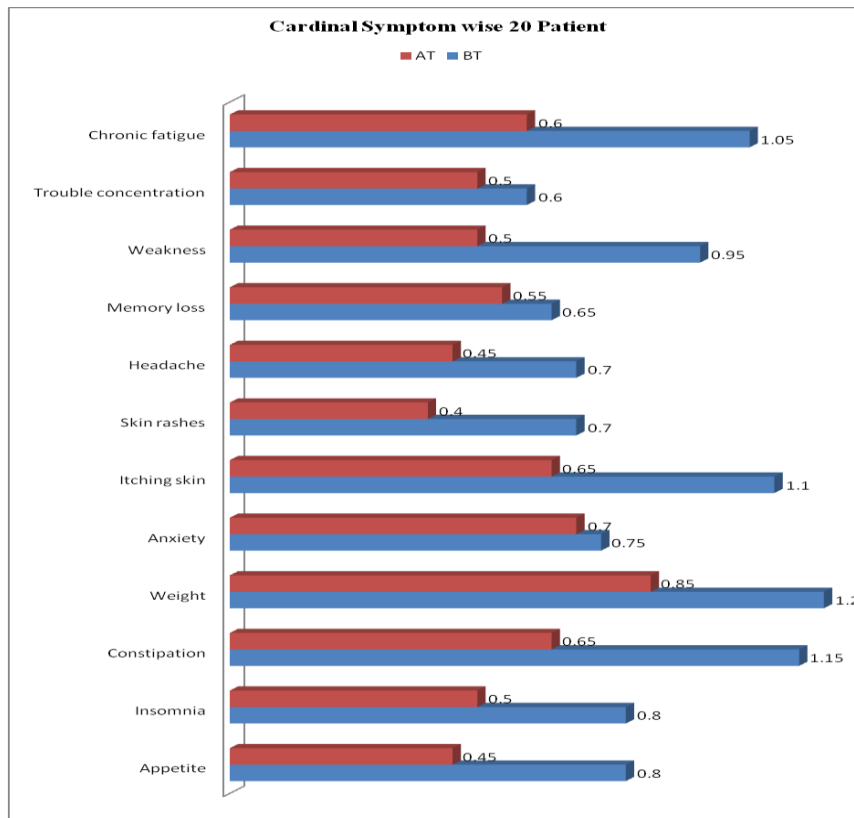
N.S. = Not Significant

SD= Standard deviation, SE= Standard error, P= P value

SUBJECTIVE PARAMETERS

Table no.-1

Cardinal symptoms	No.	Mean score			% Change	S.D. ±	S.E. ±	P	Result
		BT	AT	Diff.					
Appetite	20	0.80	0.45	0.35	43.75	.4894	0.1094	0.0156	S
Insomnia	20	0.80	0.50	0.30	37.50	0.4702	0.1051	0.0313	S
Constipation	20	1.15	0.65	0.50	44.84	0.6070	0.141	.0039	V.S
Weight	20	1.2	0.85	0.35	29.16	0.4894	0.01094	0.0156	S
Anxiety	20	0.75	0.70	.050	6.66	0.2236	0.05	0.9999	N.S.
Itching skin	20	1.1	0.65	0.45	40.90	0.5104	0.1141	0.0039	H.S
Skin rashes	20	0.70	0.40	0.30	42.85	0.4702	0.1051	.0313	S
Headache	20	0.70	0.45	0.25	35.71	0.4443	0.09934	0.0625	N.S
Memory loss	20	0.65	0.55	0.10	15.38	0.3078	.06882	.50	N.S
Weakness	20	0.95	0.50	0.45	47.36	0.6048	0.1352	0.0137	S
Trouble concentration	20	0.60	0.50	0.10	16.66	0.3078	0.06882	0.50	N.S
Chronic fatigue	20	1.050	0.60	0.45	42.85	0.5104	0.1141	0.0039	H.S



**LABORATORY PARAMETERS-
(Paired t Test)**

Table no.-2

Objective parameter	No.	Mean score			% Change	S.D. ±	S.E. ±	P	t	Result
		BT	AT	Diff.						
Hb%	20	13.985	14.255	-0.27	1.93	.8228	0.1840	0.1586	1.468	N.S
Serum Bilirubin(T)	20	0.86	0.85	0.01	1.16	.1971	.04407	0.8229	.2269	NS
Serum Bilirubin(D)	20	0.83	0.8358	-0.005	0.60	.1932	.04321	.9091	.1157	NS
Serum protein	20	6.425	6.260	.1650	2.56	.4082	.09127	.0865	1.808	NS
SGOT	20	38	37.150	0.85	2.23	3.631	0.8120	.3083	1.047	NS
SGPT	20	34.05	34.250	-0.2	0.58	4.408	.9857	.8414	.2029	NS
ESR	20	6.5	5.8	.70	10.76	3.045	.6809	.3169	1.028	NS
TLC	20	6575	5970	605	9.2	711.17	159.02	.0012	3.804	VS
DLC(N)	20	58.2	55.5	3.150	5.41	3.829	.8562	.0016	3.679	VS
DLC(L)	20	33.1	28.95	4.15	12.53	5.264	1.177	.0023	3.525	VS
DLC(E)	20	4.2	3.25	.95	22.61	1.191	.2663	.0021	3.567	VS
DLC(M)	20	4.5	5.3	-0.8	17.77	1.963	.4389	0.6841	1.823	NS
DLC(B)	20	0	0	0	0	0	0	-	-	-

(Hb-Haemoglobin; TLC-Total Leucocytes Count; ESR-Erythrocyte Sedimentation Rate; DLC-Different Leucocytes Count)

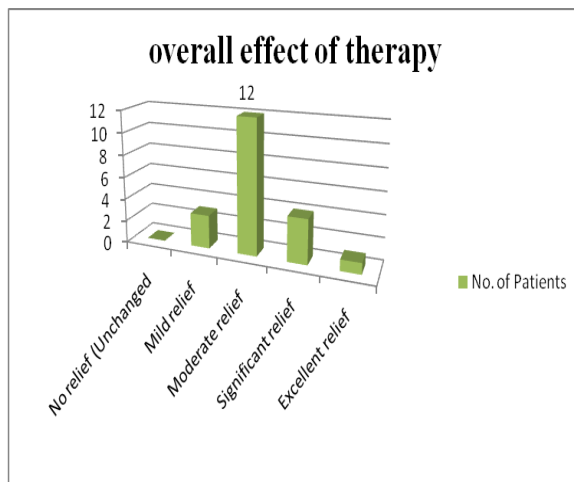
Overall Effects of Therapy -

Table no.3 -Improvement Grading Scale

S. N.	Observation	Percentage
1.	No relief	0%
2.	Mild relief	1-25%
3.	Moderate relief	26-50%
4.	Significant relief	51-75%
5.	Excellent relief	76-100%

Table no. 4 : showing the overall effect of therapy

Effects	No. of Patients	Percentage (%)
No relief (Unchanged)	0	0%
Mild relief	3	15%
Moderate relief	12	60%
Significant relief	4	20%
Excellent relief	1	5%



Excellent relief was found in 5% of patients, while significant relief in 20%, moderate relief in 60% whereas 15% were found mild relief.

DISCUSSION

Kashyapokta virechan yoga [4] and *Nagabala ghritam* [5] was prepared in NIA Pharmacy jaipur with supervision expert but as the nagabala was not available in the NIA Pharmacy and ayurvedic bhandars jaipur, so gangaruki (*Grewia populifolia*) used instead of nagabala (*Grewia hirsuta*).

As far as contents of *kashyapokta dushivishari virechan yoga* are concerned it has 4 ingredients. As far as we took 1 part of *Haritaki*, 1 Part *Saindhava lavana*, 1 part *Magadhi* and 1 part *Maricha*. *Haritaki* which is supposed to be best for *anulomana*. *Anulomana* drug has its specific effect on GI tract known as *anulomana*. it is also increasing its digestion and after digestion,

i.e. *Amapachan* it expels *mala* from intestine. we think that , it must have some effect like *virechana* or which is near to *virechana* or *Strasana* or *Bhedana* . when the patient is already suffering from *chronic pesticide toxicity* and its disease when every *dhatu* of the body is dissociated due to *shaithilya* and due to presence of *visha* in the internal *dhatu* or deeper *dhatu* it is most essential to have such effect after a clear survey of *rasa guna* , *virya* , *vipaka* and *prabhava* of all these 4 ingredients we have found that *Haritaki* is *pathya* Another point is that , this is also having *madhura rasa* , this is *tridoshaghna* also. From the above discussion it is clear that *Marich*, *pippali* and *Haritaki* (*kashaya rasa pradhana*) are having *katu rasa* and *Ushna Veerya* except *Saindhava lavana* which make the drug to act as *kaphashamaka*, *pittavardhaka* (*dhatu-rupi*= *Agni*) and *Amavisha doshahara*. *Katu Rasa* acts with following properties- *Deepana*, *Pachana*, *Ruchikara*, *Shodhana*, *Srotansi Vivrunoti* (*Prasaryati Srotansi Arundatta*), *Kaphaghna*. As earlier mentioned *Katu Rasa* is present in 3 *Dravya*, so it probably helped as- With *Deepana Karma* it helped in *Jatharagni deepana* and also *Dhatvagni Deepana*. With *Pachana Karma* it helped in *Ama Pachana* which is main cause in the *Samprapti* hence with *Deepana* and *Pachana Karma* it helped in *Samprapti Vighatana*. *Haritaki* have *Tridoshashamaka* property which was specially indicated for *Vatanulomana*. it is *kashayarasa pradhana dravya*. By virtue of *kashaya rasa*, it alleviates *kapha* along with *pitta*. *kashaya rasa* is mentioned as *astravishodhana* which also purified blood. so that different inflammatory reactions taking place in tracheobronchial tube can be minimised. As far as *vipaka* is concerned only *maricha* have *katu vipaka* that enhances the *Jatharagni*, *dhatvagni* and normalize the metabolic process. *Madhura Vipaka* which showed *Srishta Vita Mutra* action i.e. *Vatanulomana* action. By *Snigdha Guna & Madhura Vipaka*, *Pippali* helps to increase the *Bala* of patient. *Pippali* was

having Rasayana action on *Pranavaha Srotasa* also. We have selected the another drug *nagabalagritam* has main content *nagbala (gangaruki), bala, dugdha, priyal, trikantaka, yasthimadhu, goghrit, atibala, kapikachhu, ashv gandha, satavari (bhiru), meda, mrinal, shringatak etc..* That combination of drug is only for the purpose of promote immunity along with physical strength to explain the mode of action we have visited all the ayurvedic literature towards the property of ingredients of this combination.

- ✓ Appetite : it is clear that *Marich, pippali* and *Haritaki (kashaya rasa pradhana)* are having *katu rasa* and *Ushna Veerya* except *Saindhava lavana* which make the drug to act as *kaphashamaka, pittavardhaka (dhaturopi= Agni)* and *Amavisha doshahara*. *Katu Rasa* acts with *Deepana, Pachana, Ruchikara, Shodhana*.
- ✓ Insomnia : *Ashv gandha* are having *Kashaya, Madhura rasa & Ushna veerya & Madhura vipaka* and act as *Mastishkashamaka*. *Medha, Mahamedha* also act on *Nadibalya & satavari* act as *medhya* and gives relief in sleeping trouble.
- ✓ Constipation : *Haritaki* which is supposed to be best for *anulomana*. *Anulomana* drug has its specific effect on GI tract known as *anulomana*. it is also increasing its digestion and after digestion, i.e. *Aamapachan* it expels *mala* from intestine.
- ✓ Weight: it is clear that *nagbala, bala, dugdha, priyal, trikantaka, yasthimadhu (madhura rasa pradhana)* are having *madura rasa and sheet Veerya and madura vipak* which make the drug to act as *Balya-brmhana, vajikarana, ojovardhana, Kantivardhaka, Chakshushya, Vrishya, Varnya, Raktaprasadana. Ashv gandha, kapikachhu* also having *madhura vipaak* act as *Balya-brmhana*.
- ✓ Itching skin & skin rashes: *prapundarik and mrinal, shaluk* are having *kasaya, madhura, tikta rasa and sheet veerya*

which make the drug to act as *Dahaprasamana, Varnya-tvagdosahara*

- ✓ Weakness: *Atibala, bala, goghrita* are having *madhura rasa, guru, singdha, sheet veerya and madhura vipaak* which make the drug to act as *Balya-brmhana, vajikarana, ojovardhana, Kantivardhaka. Kapikachu and ashv gandha* also *balya*.
- ✓ Chronic fatigue: *Ashv gandha, satavari* are having *madhura tikta rasa and madhura vipaak* which act as *Vedanasthapana, Medhya, Rasayana. Medha, mahamedha* also act as *Vedanasthapana, Dipana, Vatasamaka, Nadibalya*.^[6]

The 60% chronic pesticide exposed patients has got moderate relief, followed by 20% significant relief, followed by 15% mild relief, and 5% was found excellent relief.

Thus it is worth mentioning that *nagabalagritam* when administered along with *kashypokta dushivishari virechan yoga* are proved to be potent remedy for the management of long term hazards of pesticide, it gives significant results.

CONCLUSION

Thus it is worth mentioning that *nagabalagritam* when administered along with *kashypokta dushivishari virechan yoga* are proved to be potent remedy for the management of long term hazards of pesticide, it gives significant results.

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How to cite this article: Kumawat DK, Sharma M, Porte SM. Clinical efficacy of *Kashyapokta Virechan Yoga & Nagbala ghritam* in long-term health hazards of pesticides. Int J Health Sci Res. 2019; 9(5):225-232.
