

## LONG TERM HAZARDS OF PESTICIDES ON FARM LABOR: A CLINICAL SURVEY STUDY

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### ABSTRACT

After green revolution the consumption and utilization of pesticides has been increased, this causes long term hazards of pesticides in human beings directly or indirectly. As the farm labor has directly exposed to pesticide during the spraying the continuous persistent long term exposure of pesticides causes chronic cumulative toxicity. Though the chronic toxicity of *Tuth* (cu sulphate) which is known as a earliest pesticide mention in Ayurveda has found but the toxicity of chemically composed pesticides like organophosphate has not mention in Ayurveda but there is need of time to know everything about toxicity of chemically composed pesticide in aspect of Ayurveda so that Ayurvedic protocol for clinical management of pesticides should be developed. Hence this survey study ‘‘Long term hazards of pesticides on farm labor’’ in Tada village of Ramgarh tehsil district Jaipur, Rajasthan has been carried out. 100 farm labor that had history of exposure to pesticides since more than five years during spraying were selected for survey study randomly. Difficulty in breathing was found maximum in Respiratory system. Headache along with anxiety, trouble sleeping, memory loss, dizziness, trouble in concentration were found maximum in Nervous system. Dermatological manifestation like itching and rashes were found in most of the patients. Maximum patient were found who having vitiation of *pureshvaha srotas followed by Rasvaha, Annavaha, Pranavaha* along with vitiation in *rakta and rasa dathus*.

**KEYWORD:** Pesticide, Cumulative Toxicity, *Dushi Visha*.

### INTRODUCTION

The World Health Organization and the United Nations Environment Programmed estimate that each year, 3 million workers in agriculture in the developing world experience severe poisoning from pesticides, about 18,000 of whom die.<sup>[1]</sup> According to one study, as many as 25 million workers in developing countries may suffer mild pesticide poisoning yearly, Chemical or biological substance designed to kill or retard the growth of pests. Practically all chemical pesticides are poisons and pose long-term danger to the environment and humans through their persistence in nature and body tissue. Along with the green revolutions the farmers are using the pesticides abundantly. Pesticide compounds are well absorbed through the mucous membrane of GI tract, respiratory tract and through the skin. Some pesticides are stored in the body fat and slowly realised in the circulation, prolonging the duration of its action. The high risk groups exposed to pesticides include the production workers, formulators, sprayers, mixers, loaders and agricultural farm workers.<sup>[2]</sup> Signs and 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.<sup>[3]</sup>

In *Ayurveda* the description of about the *kiritrim vishas* has found details, even the natural pesticide *Tuthya* has also found in the text book of *Ayurveda* though pesticide like organophosphorus, organochlorin, carbamates is not found in text book of *Ayurveda*, as it has evaluated in nineteen centuries. But the pathophysiology and Clinical manifestation of pesticides is somewhat mimic to *Dushee Visha*. Hence there is need to evaluate, elaborate, and discuss the long term hazards of chemically composed pesticide in view of ayurvedic aspect.

### AIMS AND OBJECTIVE

1. To survey the health hazards of chronic exposure of Pesticides in Farm Labors who has already exposed specially during work in farm.
2. To evaluate, elaborate, and discuss the long term hazards of chemically composed pesticide in view of Ayurvedic aspect.

## MATERIAL AND METHOD

The Performa for the Study on the pesticides was prepared by using guidelines of WHO, Occupational toxicology and basic text book of Ayurveda (*Brhatya, Laghutrya*). This survey studies was carried out in rural area of Jaipur district specially Ramgarh Tehsil. The 100 farm labor who had already.

## RESULT

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

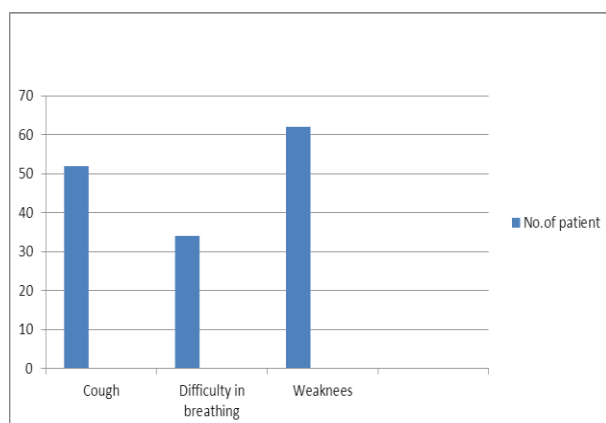
### System wise distribution of pesticide exposed from labor (long term hazards)

**Table 1: Respiratory System Wise Distribution.**

S.No	Clinical manifestation	No. of patient
1.	Cough	52
2.	Difficulty in breathing	34
3.	Weakness	62

Maximum patient are suffering from Weakness (62%) and cough (52%)

### BAR Diagram 1

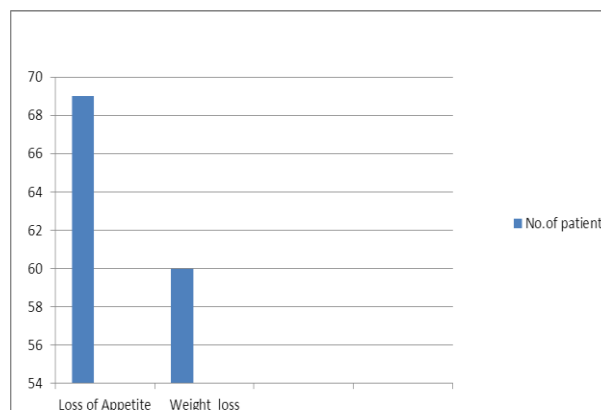


**Table 2: Gastro Intestinal System Wise Distribution.**

S.No	Clinical manifestation	No. of patient
1.	Loss of Appetite	69
2.	Weight Loss	60

Maximum patient are suffering from Loss of Appetite (62%) and Weight Loss (60%)

### Bar diagram 2

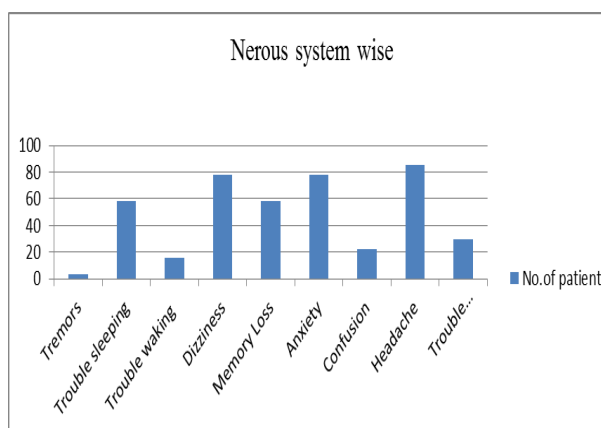


**Table 3: Nervous system.**

S.No	Clinical manifestation	No. of patient
1.	Tremors	3
2.	Trouble sleeping	58
3.	Trouble waking	16
4.	Dizziness	78
5.	Memory Loss	58
6.	Anxiety	78
7.	Confusion	22
8.	Headache	85
9.	Trouble concentrating	30

Maximum patient are suffering from headache (85%), anxiety (78%), trouble sleeping (58%), memory loss (58%), dizziness (58%), trouble concentrating (30).

### Bar diagram 3

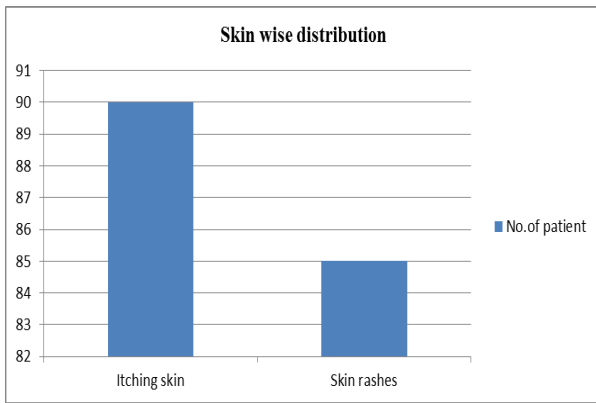


**Table 4: Skin.**

S. No	Clinical manifestation	No. of patient
1.	Itching skin	90
2.	Skin rashes	85

Maximum patient were suffering from itching skin(90%) and skin rashes(85%).

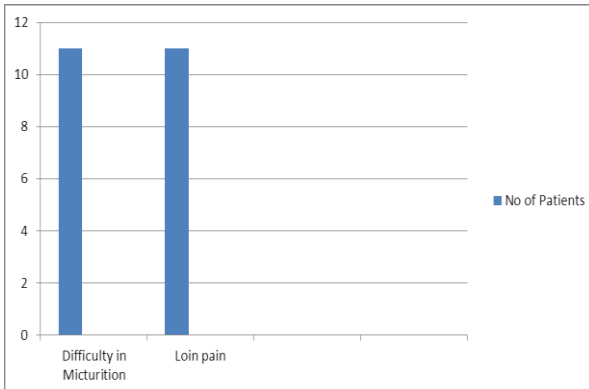
**Bar diagram 4**



**Table 5: Excretory system.**

S.N.	Clinical manifestation	No. of patient
1.	Difficulty in Micturition	11
2.	Loin pain	11

**Bar Diagram 5**



**Table 6: Age wise distribution of pesticide exposure farm labor (long term hazards).**

S. No.	Age group yr.	No of patient
1.	20-35	18
2.	36-50	60
3.	51-65	22

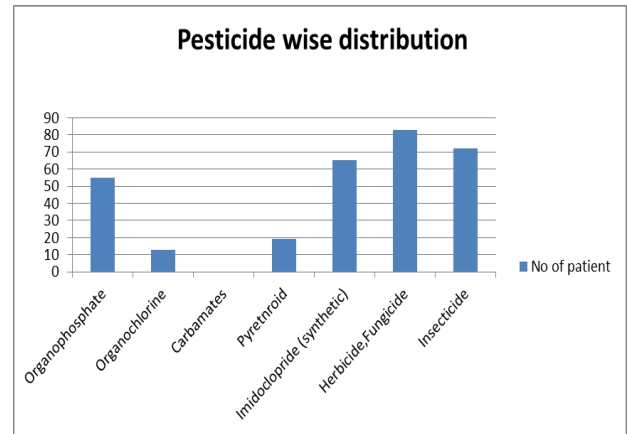
Among 100 patient of pesticide spraying maximum patient were found the age group belonging middle age group (36-50 yr.).

**Table 7: Pesticide wise distributions.**

S. No.	Type of pesticide	No of patient	Percentage
1.	Organophosphate	55	55%
2.	Organochlorine	13	13%
3.	Carbamates	0	0%
4.	Pyretnroid	19	19%
5.	Imidoclopride (synthetic)	65	65%
6.	Herbicide,Fungicide	83	83%
7.	Insecticide	72	72%

Among 100 patient of pesticide spraying maximum patient were spraying organophosphate, herbicide, fungicide, insecticides, imidoclopride (synthetic).

**Bar diagram 4**

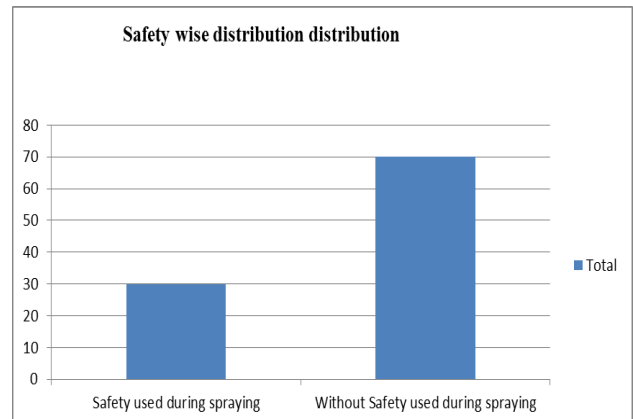


**Table 9: Safety wise distribution of pesticide exposure farm labor.**

S.N.	Safety wise distribution	Total	Percentage
1.	Safety used during spraying	30	30%
2.	Without Safety used during spraying	70	70%

Maximum number of patient (70%) were found who not used Safety during spraying.

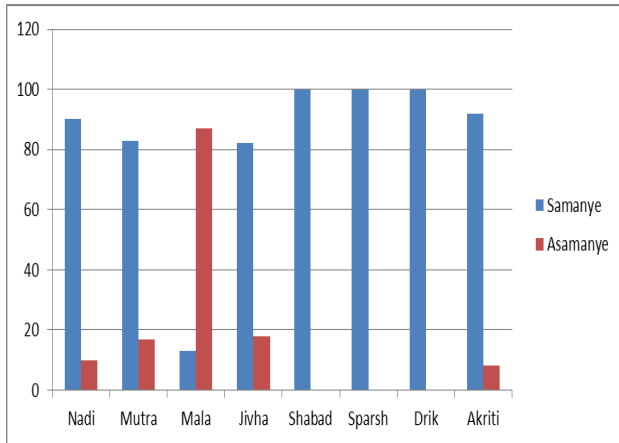
**Bar diagram-6**



**Table 10: Distribution of Asthavidh Pariksha.**

S.N.	Pariksha	Samanye	Asamanye	Total
1.	Nadi	90	10	100
2.	Mutra	83	17	100
3.	Mala	13	87	100
4.	Jivha	82	18	100
5.	Shabad	100	-	100
6.	Sparsh	100	-	100
7.	Drik	100	-	100
8.	Akriti	92	8	100

**Bar diagram 7**  
Distribution of Asthavidh Pariksha

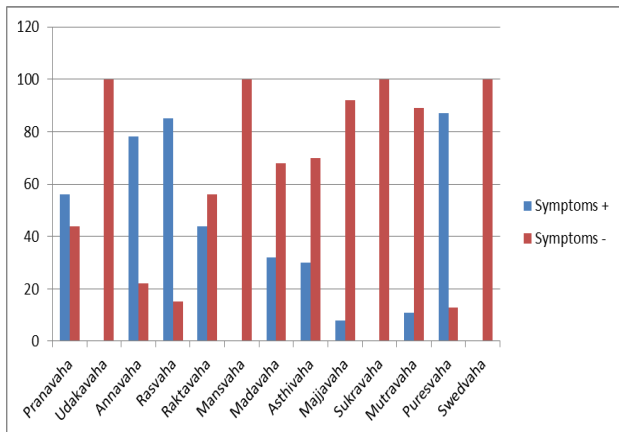


**Table 11: Distributaion of srotas pareeksha.**

S. N.	Srotas	Symptoms got	Symptoms Not found	Total No. of patient
1.	Pranavaha	56	44	100
2.	Udakavaha	00	100	100
3.	Annavaaha	78	22	100
4.	Rasvaha	85	15	100
5.	Raktavaha	44	56	100
6.	Mansvaha	0	100	100
7.	Madavaha	32	68	100
8.	Asthivaha	30	70	100
9.	Majjavaha	08	92	100
10.	Sukravaha	0	100	100
11.	Mutravaha	11	89	100
12.	Puresvaha	87	13	100
13.	Swedvaha	00	100	100

Maximum patient were suffering from Annavaaha(78%), Rasvaha(85%), Pranavaha(56%) and pureshvaha srotas (87%) dushti.

**Bar diagram 8**  
Distributaion of sroro pareeksha



**Table 12: Pranavaha srotas.**

S.N.	Clinical manifestation	No. of patient
1.	Atisrama swasa	34
2.	Sasuhula sawasa	22

**Table 13: Annavaaha srotas.**

S.N.	Clinical manifestation	No. of patient
1.	Aruchi	09
2.	Avipak	69

**Table 14: Rasvaha srotas.**

S.N.	Clinical manifestation	No. of patient
1.	Tandra	78
2.	Angmarda	85
3.	Avsad	78
4.	Karshya	60
5.	Aganimandya	69

**Table 15: Raktavaha srotas.**

S.N.	Clinical manifestation	No. of patient
1.	Pidika	42
2.	Mukhapak	44

**Table 16: Madavaha srotas.**

S.N.	Clinical manifestation	No. of patient
1.	Hastaoada daha	28
2.	Alasya	22

**Table 17: Puresvaha srotas.**

S.N.	Clinical manifestation	No. of patient
1.	Atigrathita yukta puresha	87

**Table 18: Prakriti wise distribution of pesticide exposure 100 farm labor.**

S.No.	Prakurti	No. of patient	Percentage
1.	V	0	0%
2.	P	0	0%
3.	K	0	0%
4.	VP	56	56%
5.	PK	32	32%
6.	VK	12	12%
7.	VPK	0	0%

Maximum patient were found vata-pitta prakrit (56%)

**Table 19: Dathu wise distribution of pesticide exposure 100 farm labor.**

S.No.	Dhatus	No. Of patient	Percentage
1.	Rasa	42	42%
2.	Rakta	44	44%
3.	Mamsa	0	0%
4.	Meda	32	32%
5.	Asthi	30	30%
6.	Majja	8	8%
7.	Shukra	0	0%

Maximum patient were affected rasa (42%), rakta dathus (44%).

## DISCUSSION

Pesticide is any substance or mixture of substances specifically intended to prevent, repel, destroy or lessen the effect of a pest. As India is an agricultural country and major Indian people depend on agriculture. After the green revolution the utilization of pesticide has increased but excessive utilization of pesticide for prolonged periods causes long-term hazards to living beings including humans.<sup>[4]</sup> As it will accumulate in the body systems and various organs which will cause chronic hazards like weakness, weight loss, anxiety, memory loss, skin rashes, constipation, itching, loss of appetite when the level of pesticides crosses the maximum limit in the human tissue. Though in the Ayurveda description about chemically composed pesticides is not found directly but pesticides like copper sulphate (Tuth) has been mentioned in various text books of Ras Shastra. According to *Yoga Ratnakara Kritrim visha* is a type of *visha* which is further divided into *Gara visha* and *Dushi visha*. *Dushivisha* is a combination of poisonous substances (*Savisha*).<sup>[5]</sup> According to *Yoga Ratanakar*, *Kritrim visha* affects within 15 days or one month and symptoms are giddiness, cough, breathlessness, weakness, haemorrhage, fever, swelling, pale yellow eyes which are similar to the clinical manifestation of chronic toxicity of pesticides somewhat.<sup>[6]</sup> The survey was conducted in the village (Saipur, Ghatwari) of Ramgarh tehsil in Jaipur district on a farmer specially exposed to pesticide during the spraying since a minimum of 5 years. The farmer of the village was selected randomly for the survey study. Among 100 patients of pesticide spraying, the maximum patients were found who sprayed fungicide followed by insecticide including organophosphorus. The maximum number of patients were found who did not use safety during spraying. Difficulty in breathing was found maximum in the respiratory system. Headache along with anxiety, trouble sleeping, memory loss, dizziness, trouble in concentration were found maximum in the nervous system.<sup>[7]</sup> Dermatological manifestations like itching and rashes were found in most of the patients. The maximum patients were found who had vitiation of *pureshvaha srotas* followed by *Rasvaha*, *Annavaha*, *Pranavaha* along with vitiation in *rakta* and *rasa dathus*.

## CONCLUSION

Headache and dizziness were found maximum in the nervous system, loss of appetite was found maximum in the GIT system and itching and rashes were found maximum in farm labor exposed to pesticides. *Ras* and *Rakta dhatu* vitiation were found in maximum farm labor while *Purishvaha*, *Annavaha*, *Rasvaha*, *Raktavaha* and *Pranavaha* shrotas vitiation were found in maximum farmer exposed to pesticide.

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