

# Paroxysmal Atrial Fibrillation After Pretroid And Organic Phosphor Intoxication

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## Abstract

Cypermethrin is one of the synthetic pretroid insecticides which are common using for agriculture, home and veterinary application because of its high biological efficacy and low toxicity for mammals . Dichlorvos is an insecticide and an antihelminthes which is used to control insects primarily in storage areas and barns. It is a member of organic phosphor family with wide spectrum. We checked the literature, we saw only one case for paroxysmal atrial fibrillation due to side effect of organic phosphor agents. In our study, we evaluate two paroxysmal atrial fibrillation cases without any cardiac pathology after accidental Cypermethrin inhalation and accidental Dichlorvos ingestion.

## INTRODUCTION

Cypermethrin is one of the synthetic pretroid insecticides which are common using for agriculture, home and veterinary application because of its high biological efficacy and low toxicity for mammals . Due to pretroids' negligible absorption of skin, they can cause systemic toxicities by inhalation or orally. In mild affected cases fatigue, nausea, vomiting, hypersalivation, dizziness and some neuropathy symptoms can be seen (1). Dichlorvos is an insecticide and an antihelminthes which is used to control insects primarily in storage areas and barns. It is a member of organic phosphor family with wide spectrum (2). In literature, organic phosphor compounds cause cardiac conduction defects by their over stimulation of muscarinic receptors and affects on respiratuvar or circulative centre in nervous system but the mechanism is unclear (3). Although when we checked the literature, we saw only one case for paroxysmal atrial fibrillation. In our study, we evaluate two paroxysmal atrial fibrillation cases without any cardiac pathology after accidental Cypermethrin inhalation and accidental Dichlorvos ingestion.

## CASE 1

A twenty five years old male farmer applied to our emergency department with nausea, vomiting, dizziness, palpitation, pins and needles in extremities after two hours of applying insecticide to his farm. In his examination there was no pathological sign, arterial blood pressure was 120/80 mmHg. A complete blood count, thyroid tests, blood gases

and blood electrolytes (Na, K, Mg, Ca) were normal. We performed electrocardiogram (ECG), it was atrial fibrillation with rate approximately 115/min (figure 1 a). We administered supplementary treatment, no anti arrhythmic medication applied. Twelve hours after admission, the AF spontaneously converted to sinus rhythm (figure 1 b). During continuous ECG monitoring in the emergency department, no recurrence of the arrhythmia was observed. A transthoracic echocardiography found no structural or functional anomaly. Finally, no etiology other than the Cypermethrin inhalation could explain this AF episode. We discharged the patient at his twenty fourth hour of admission.

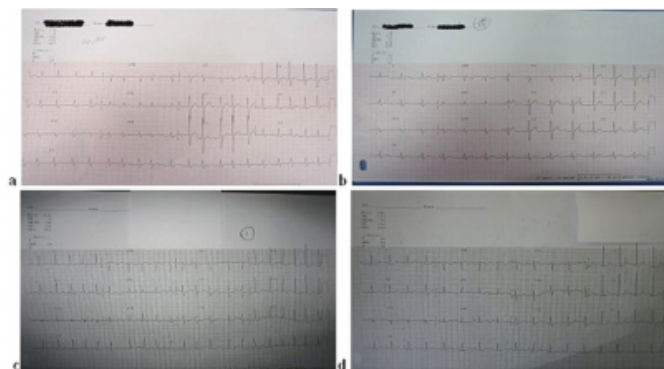
## CASE 2

A thirty years old male ingested Dichlorvos accidentally about an hour before admission. Hypersalivation, nausea, vomiting were developed. His Glasgow Coma Scale was 15, arterial blood pressure was 130/80 mmHg. The ECG revealed atrial fibrillation (120/min) (figure 1 c). His all laboratory parameters (especially serum levels of TSH, fT3, fT4) were in normal range and lack of any respiratory distress, hypoxia, cardiac enzyme level increase, or ECG signs showing ischemia rules out any pulmonary or cardiac causes of this patient's AF. No cardiac pathologic sign or diagnoses were in his past. Gastric lavage and active charcoal, intra venous fluid performed. One gram of pralidoxim infused by vein line. No anti arrhythmic treatment applied. Six hours after admission, the AF

spontaneously converted to sinus rhythm (figure 1 d). Echocardiography demonstrated no structural or functional heart disturbances. He discharged after 72 hours of admission without any repetition of arrhythmia.

### Figure 1

Figure 1: a. Case 1 initial electrocardiogram b. Case 1 electrocardiogram after twelve hours c. Case 2 initial electrocardiogram d. Case 2 electrocardiogram after six hours



### DISCUSSION

Insecticide intoxication can engender a lot of systemic problems by their muscarinic or nicotinic receptor effects. Patients examination findings are related to these receptors and physicians can see weighted effected receptors' symptoms (4). Although hypotension and sinus bradycardia are result of effected muscarinic receptors, hypertension and sinus tachycardia can occur because of effected nicotinic receptors in insecticide intoxications.

In the literature there are some studies about cardiac effects of organophosphate or carbamate intoxications, one of them reports 23 cardiac affected patients of 37 intoxicated patients. Their electrocardiographical abnormalities were prolonged Q-Tc interval, sinus tachycardia or bradycardia, ST-T changes, conduction defects, torsade de pointes, ventricular fibrillation (5).

On the other hand another different study's result for the cardiac efficiency rate of organic phosphate or carbamate intoxications was %67. They determined similar electrocardiographical findings with preceding study except atrial fibrillation of four patients. Three of them were with acute pulmonary edema and severe hypoxia and one had ST elevation and increased cardiac enzymes (6). We think that severe hypoxia and elevation of cardiac enzymes can precipitate atrial fibrillation for these patients.

Finally for our cases' examinations and laboratory findings, there were no reasons for atrial fibrillation development except their Dichlorvos and Cypermethrin intoxication. Excluding our study only one case report published paroxysmal atrial fibrillation after carbamate exposing and their patient's rhythm returned at 24 hr after presentation (7). Deficiency of our study is we can not evaluate acetyl cholinesterase level because of disability of our hospital. Nevermore products of toxic materials have brought to emergency department by our patients' people so we make certain of organic phosphate and carbamate.

### CONCLUSION

Atrial fibrillation is a rare complication of insecticide intoxication. Cypermethrin and Dichlorvos can cause paroxysmal atrial fibrillation in persons even if any cardiac pathology.

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