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## Acute Organophosphate Poisoning in Second March Teaching Hospital

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### Abstract:

**Objective:** To study acute organophosphate (OP) insecticide poisoning.

**Design:** A descriptive prospective observational study.

**Setting:** The intensive care unit (ICU), 2<sup>nd</sup> March Teaching Hospital, Sebha, South Libya.

**Patients:** Patients with acute poisoning admitted to the ICU from 1<sup>st</sup> January to 31<sup>st</sup> December 2006. Clinical data collected included demographic features, history of drug intake, symptoms, signs and laboratory results.

**Results:** One hundred and thirty-six patients were admitted to the ICU with a mean age of 30.4 years. Ninety-two (67.6%) were female. Acute OP poisoning was the leading cause (54.4%), followed by bleach (11%) and scorpion sting (11%). Self-poisoning with OP, in 56 patients (75.7%) was the major factor. One patient (1.35%) died as a result of OP poisoning.

**Conclusion:** Acute OP poisoning is a real medical and social problem that must concern every practicing doctor. In particular self-poisoning which has become a recognized pattern of social behaviour, is a crisis situation which must be treated as such with maximum effort from medical, psychiatric and social welfare services.

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### Introduction:

Knowledge about poisons existed as long ago as the ancient writings of the Egyptians which made reference to poisons from plants. A passage from an ancient papyrus has been translated as "speak not of the name of Yao under penalty of the peach", indicating knowledge of poison, hydrocyanic acid in parts of the peach tree or fruit.

The papyrus Ebers from 1500 BC also mentions antimony, copper, hyoscyamus, lead and opium as poisons. Writings from India during the period 600 to 100 BC mention poison including gold, copper, iron, lead, silver and tin. Socrates was executed in 339 BC with an extract of hemlock. A book entitled "The History of Plants" published in 300 BC by Theophrastus refers to medicinal and poisonous plants.

Numerous poisonings have been recorded in the history of the first 1800 years after the Christ. Nine of the successors of Charlemagne, Holy Roman Empire, died before the 1400s of poisonings. Famous poisonings included five popes, many cardinals, and several kings. Thus it became a commonplace for kings to have 'tasters' of their food.<sup>1,2</sup>

In recent years, the rising incidence of acute poisonings has become a considerable problem for all medical practitioners whether they work inside or outside hospital. Organophosphate compounds (OP) are widely used as insecticide in agriculture worldwide and are common causes of poisoning that continue to result in significant fatalities.<sup>3</sup>

In some countries, OP are used as chemical agents of warfare. OP may cause acute or chronic poisonings after accidental or suicidal exposure. Worldwide, as estimated 3 millions people are exposed to insecticide each year, with up to 3 thousands fatalities.<sup>4,5</sup>

Toxicity generally results from accidental, intentional ingestion or from exposure to agricultural pesticides.<sup>4,6</sup>

Other potential causes of OP toxicity include ingestion of contaminated fruit, flour, or cooking oil, and wearing contaminated clothing.<sup>6,7</sup>

The current study was aimed to investigate acute organophosphate poisoning in south Libya.

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**Materials and Methods:**

A prospective descriptive study was performed on the patients with acute poisoning admitted to the Intensive Care Unit of the 2<sup>nd</sup> March Teaching Hospital between 1<sup>st</sup> January 2006 and 31<sup>st</sup> December 2006.

Data were collected on a standard form including demographic characteristics, clinical presentation and history of previous disease, drug intake, physical signs, echo cardiography, radiography results and laboratory findings.

**Results:**

A total of 136 patients were admitted to the Intensive Care Unit (ICU) of the Second March Teaching Hospital between 1<sup>st</sup> January 2006 to 31<sup>st</sup> December 2006.

Nine-two (67.6%) were females and forty-four (32.4%) were males. The mean age was 30.5 years (range 11 to 62 years). Seventy-three (53.7) were students, whereas thirty (22.1%) were housewives. One hundred and thirty-one (96.3%) patients were Libyan.

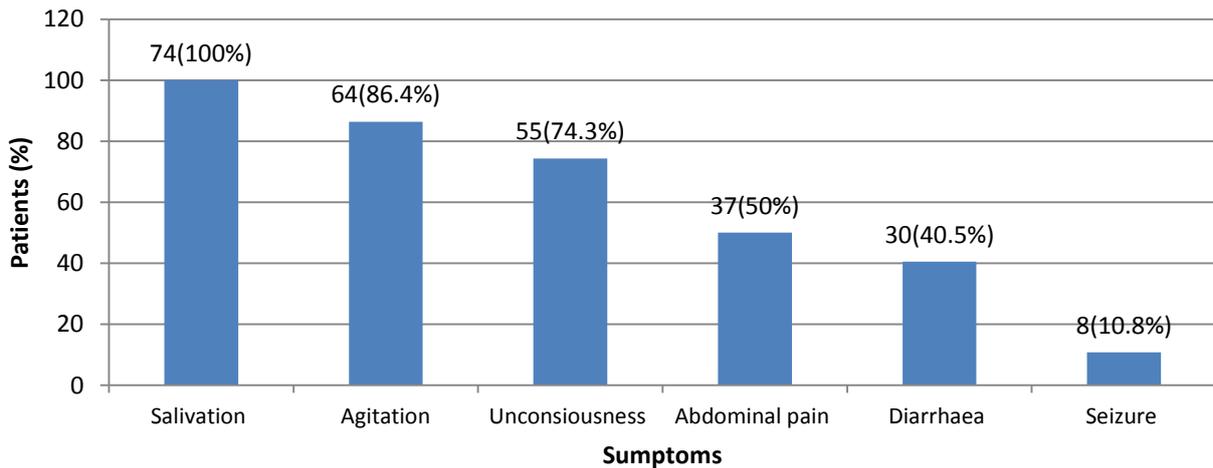
The most common cause of acute poisoning was organophosphorus (OP) poisoning (54.4%) followed by bleach (11%) and scorpion sting (11%) (Table 1).

Excessive salivation (100%) was the leading symptom and agitation was the second (86.4%) (Fig 1). Miosis was seen in all patients with OP poisoning (Fig. 2). Acute OP poisoning was reported as self-poisoning in 56 (75.7%) patients (Table 2).

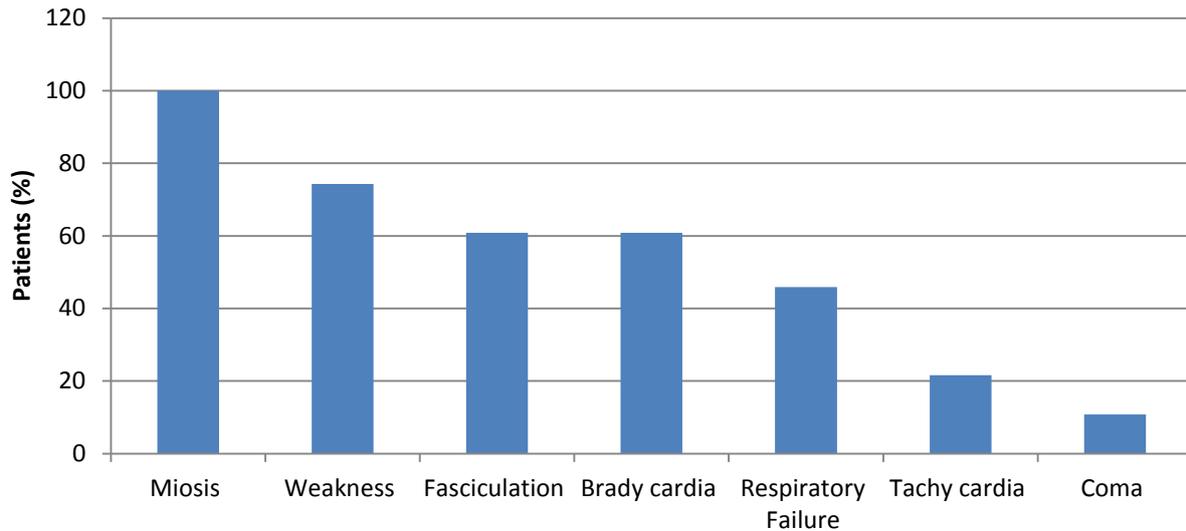
Only one (1.35%) patient died as a result of OP poisoning.

**Table 1: A etiology of acute poisoning**

Agents	Patients			
	Female	Male	Total	%
Organophosphate	49	25	74	54.4
Bleach	14	1	15	11.0
Scorpion sting	5	10	15	11.0
Kerosene	3	0	3	2.2
Carbon monoxide	2	1	3	2.2
Sulphuric acid	1	1	2	1.5
Amoxicillin	2	0	2	1.5
Paracetamol	2	0	2	1.5
Unknown	14	6	20	14.7
Total	92	44	136	100%



**Fig. 1: Symptoms of organophosphate poisoning**



**Fig. 1: Signs of acute organophosphate poisoning**

**Table 2: The manner of acute organophosphate self-poisoning**

Sex	Suicidal	Accidental	Total
Female	38 (51.4%)	11 (14.9%)	49 (66.2%)
Male	18 (24.3%)	7 (9.5%)	25 (33.8%)
Total	56 (75.7%)	18 (24.3%)	74 (100%)

**Discussion:**

In recent years, there has been growing awareness in most countries of the world, of the increasing incidence of acute poisoning. In the United States, 5 million poisonings occur every year and the number is steadily increasing. Acute poisoning is the fourth most common cause of accidental death in that country after motorcar accidents, drowning and burns. In most European countries a similar problem exists.<sup>6-10</sup>

Organophosphate (OP) insecticides are very toxic and it is likely that the incidence of their poisoning will increase as they are used as substitutes for dichlorodiphenyl-trichloro-ethane (DDT) following the ban of that substance in some countries. One drop of undiluted parathion in the eye may be fatal.<sup>11,12</sup> Their toxicity is due to the inhibition of cholinesterase, the consequent damage can be severe and may not be reversible unless the patient is treated within a few hours. Other enzyme systems may also be affected with resultant toxic effects.<sup>2,3,12</sup>

In the present series, organophosphates (OP) poisoning was the leading cause (54.4%) of acute poisoning. The mean age was 30.5 years and the incidence was higher among females

(67.6%). Seventy-three (53.7%) patients were students.

In agreement with other reports, the most frequent symptoms were excessive salivation, agitation, disturbance of consciousness and abdominal cramps while the most common physical signs were miosis, weakness and brady-cardia.<sup>13,14</sup>

Acute poisoning may be classified as self-poisoning accidental, suicidal or homicidal. Self-poisoning, in a practice to what has been called "attempted suicide or parasuicide" accounted for 75.7% of acute OP poisoning in consistence with reports from several countries.<sup>15-17</sup>

Treatment of acute OP poisoning is supportive with oximes, atropine and mechanical ventilation, in addition to gastric lavage and decontamination. Oximes, effective in the early phase, are clinically important reactivators of acetylcholinesterase.<sup>14</sup>

The mortality rate among our patients (1.35%) was much lower than in different studies reported as 12-27.6% which may be attributed to the early diagnosis and treatment.<sup>18-20</sup>

Self-poisoning, which is a conscious often impulsive manipulative act undertaken to secure redress for an intolerable situation was

the major cause (75.5%) of acute OP poisoning. In this regard, several surveys have shown that about 60% of patients consult their general practitioner in the month prior to taking the poison and many within a week of their action. In view of these facts, the scope for preventive action is clear. Furthermore, a considerable number of patients also poison themselves again after discharge from hospital. Thus, there can be no doubt that doctors can make a very important contribution to the prevention of poisoning and efforts to this goal should be taken by them and by their patients. Here, is an unfortunate tendency for some doctors and nurses to adopt an unsympathetic attitude to these patients because of the self-imposed nature of their illness. This may result in rather casual approach to the therapy, and it

is under these circumstances that real danger may exist and avoidable tragedies occur. In view of the results of several surveys, all acutely poisoned patients, at least above the age of 12, require psychiatric assessment.

Moreover, various efforts need to be made in the field of health education with the aid of school, national press and television to make the general public more aware of these dangers.<sup>10-16</sup>

In conclusion, acute OP poisoning is a very real medical and social problem that must concern every practicing physician. In particular, self-poisoning, which has become a recognized pattern of social behavior, is a crisis situation which must be treated as such with the maximum effort from medical, psychiatric and social welfare services.

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