



Arterial Blood Gas Analysis in Organophosphorus Compound Poisoning And its Outcome – A Teaching Hospital Experience

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Organophosphorus compound, Arterial blood gas analysis

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ABSTRACT We present a study of blood gas parameters in 41 cases of organophosphorus compound poisoning to study the clinical profile in subjects of organophosphorus compounds poisoning in & to identify those subjects who would require ventilation support and correlate clinically with ABG analysis.

Introduction:

Death due to intake of organophosphorus insecticides has been reported frequently from different parts of India. The important complication and cause of death in organophosphorus poisoning is respiratory failure. This results in combination of respiratory muscle weakness, central respiratory depression, increased bronchial secretions, bronchospasm and pulmonary edema.

In organophosphorus compound it is Type 2 ventilatory failure that takes place. Ventilatory failure is defined as condition in which the pulmonary system is unable to meet the metabolic demands of body in relation to carbon dioxide homeostasis⁽⁴⁾. The diagnosis cannot be made without arterial blood gas management.

Materials & Methods

A retrospective study was done of 41 cases admitted to hospital from June 2013 to June 2014. Patients were selected irrespective of age and sex. However patients with concomitant illness (or) condition likely to accentuate the respiratory failure due to organophosphorus poisoning were excluded from study.

Each patient enrolled for study underwent detailed clinical examination as per proforma which included presence of respiratory failure. A provisional diagnosis of organophosphorus compounds poisoning by patients was made on basis of a definite history of organophosphorus compound poisoning by patient or, attends and features of poisoning. An arterial blood gas sample was taken immediately after admission before atropine was started.

Results:

ABG analysis was done in 41 cases, of 41 cases 23 are males and 18 are females⁽¹⁾. The male predominance indicates easy accessibility of organophosphorus compounds. Out of 41 cases mode of consumption was ingestion in 37 cases and inhalation in 4 cases.

Out of 41 cases of O.P. compound poisoning 35 cases show miosis, 28 cases presented with altered sensorium, 25 cases had fasciculations and 25 cases with bronchial secretions. So in majority cases we notice the miosis and altered level of consciousness.

TABLE 1

Gender	No. of Cases	Percentage
Male	23	56%
Female	18	43%
Total	41	

TABLE 11

Symptoms at the time of presentation	No. of Cases (41)	Percentage
Miosis	35	85
Altered sensorium	28	68
Fasciculations	25	61
Bronchial secretions	25	61

Out of 41 cases of ABG analysis, 15 cases showed respiratory acidosis of which 11 survived & 4 expired. 21 cases showed respiratory alkalosis, of which 19 patients survived & 2 expired. 2 showed metabolic acidosis of which 2 expired. So respiratory acidosis & metabolic acidosis have high mortality (2)(3).

ABG analysis in 41 cases : TABLE II1

ABG analysis	No. of patients N =41	No. of cases	
		Survived	Expired
Normal	3	3 (100%)	-
Respiratory Acidosis	15(36.6%)	11 (73%)	4 (27%)
Respiratory Alkalosis	21(51.2%)	19 (90%)	2 (9.5%)
Metabolic Acidosis	2(4.8%)	0	2 (100%)

In our study out of 41 cases 2 types of respiratory failure are noted.

Out of 41 cases, 15 cases are of type 2 (or) hypercapnic failure (or) pump failure. All these needed ventilatory support. Out of 21 cases of respiratory alkalosis, 6 cases showed respiratory alkalosis with hypoxemia. Out of these 6 cases one expired. Though these patients were conscious they were hypoxic by ABG analysis and need oxygen therapy. ABG analysis is very sensitive in providing valuable information about adequacy of gas exchange and perfusion which was not evident on physical examination.

Table 2: Types of respiratory failure:-

Types of respiratory failure	Total no. of cases	In conscious state			In Unconscious state		
		No .of cases	Survived	Expired	No .of cases	Survived	Expired
Type 2	15	11	11	Nil	4	Nil	4
Respiratory Alkalosis with Hypoxemia	6	5	4	1	1	Nil	1

Conclusion:

By doing ABG analysis we were able to make a clinical diagnosis of respiratory acidosis (or) respiratory alkalosis, type 1 failure (or) type 2 failure.

Type 2 respiratory failure is common type of failure occurring in organophosphorus compound poisoning and treatment of choice is ventilatory support.

Ventilatory support cannot be guided by clinical assessment of respiratory inadequacy but guided only by ABG analysis. In our study conscious patient with adequate respiratory effort showed respiratory acidosis by ABG analysis. So these patients also needed ventilator support. Irrespective of level of consciousness, clinical respiratory inadequacy, if ABG shows respiratory acidosis patients needs ventilatory support.

In our study 2 cases (100%) presented with metabolic acidosis have expired suggesting metabolic acidosis in organophosphorus compound poisoning has high mortality. In our study patients with type 2 respiratory failure with unconscious state mortality is high (100%) compare to conscious state (0%). Patients with Respiratory alkalosis with hypoxemia in unconscious state mortality is high (100%) compare to conscious state.

Total mortality in our study is 19% (8 cases) compare to Eun-Jung Kang et al study⁶ 8 cases expired of 35 cases with respiratory failure.

Respiratory acidosis and metabolic acidosis have high mortality than respiratory alkalosis with hypoxemia.

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