Clinical and Investigative Determinants to ICU Admission of Adults versus Children in Acute Intoxication by Anticholinesterase Pesticides

Retrospective Study of Notified Cases

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By

Mohamed Ahmed Yehia Zakaria

(M.B.,B.Ch.)
Demonstrator of FORENSIC MEDICINE and CLINICAL TOXICOLOGY
Faculty of Medicine – October 6 University

Under Supervision of

Dr. OMAYMA ABOUL ELLA HAMED

Professor of FORENSIC MEDICINE AND CLINICAL TOXICOLOGY
Faculty of Medicine – Cairo University

Dr. ABEER AHMED ZAYED

Assistant Professor of FORENSIC MEDICINE AND CLINICAL TOXICOLOGY
Faculty of Medicine – Cairo University

Dr. MAHMOUD LOTFY SAKR

Assistant Professor of FORENSIC MEDICINE AND CLINICAL TOXICOLOGY
Faculty of Medicine – Ain Shams University

Faculty of Medicine – Cairo University
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Abstract

Anticholinesterase insecticides are the most widely used insecticides worldwide that may cause serious poisoning. Toxicity is produced by acetylcholine accumulation at cholinergic receptors. The mortality rate for poisoned patients remains high and this makes further research on factors that may affect the final outcome necessary. The main causes of death due to acute anticholinesterase insecticides poisoning include acute respiratory failure and the cardiovascular complications. This retrospective study was conducted to assess the patterns of presentations of acute severe anticholinesterase insecticide poisoning in both children and adults, and to demonstrate the clinical and investigative determinants to intensive care unit (ICU) admission in both groups of patients. Moreover, to study the outcomes and predictors of mortality in these patients who require intensive care therapy. This study included a total of 117 patients with severe anticholinesterase insecticide poisoning, of whom 78 were adults and 39 were children. They were admitted to the ICU of the Poison Control Center of Ain Shams University Hospitals (PCC) during the period from the 1^{st} of January 2006 to the 1^{st} of January 2007. Data obtained were divided into quantitative variables, and qualitative variables. Data was statistically analyzed using a PC supplied with the "Statistical Package for Social Sciences" (SPSS) – version 0.8. The clinical determinants for ICU admission in adults were mainly tachycardia and hypertension, while, in children were mainly absence of nausea and vomiting, muscle weakness, agitation, confusion, fasciculations, and pulmonary edema. Regarding the investigative determinants for ICU admission in adults in the present study, these were hypokalemia, decreased pO_2, increased pCO_2, decreased pH. As for children, the significant decrease in k^+ level, the marked decrease in O_2 saturation, pO_2, and pH, and the high level of pCO_2 with marked acidosis.

KEYWORDS: Anticholinesterase, Insecticides, Toxicity, Determinants, Predictors, Mortality.

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List of abbreviations

WHO	World Health Organization
ICU	Intensive Care Unit
GABA	Gamma – Aminobutyric Acid
pO2	Partial Pressure of Oxygen
pCO2	Partial Pressure of Carbon Dioxide
PON	Paroxnase Enzyme
OPIDN	Organophosphorus Induced Delayed Neuropathy
NTE	Neuropathy Target Esterase
HCO3	Bicarbonate
pH	Per hydrogen ion concentration
BUN	Blood Urea Nitrogen
EMG	Electromyogram
ABGs	Arterial Blood Gases
CNS	Central Nervous System
Na+	Sodium
K+	Potassium
PChE	Pseudocholinesterase
OPC	Organophosphorus Compounds
PCC	Poison Control Center
BBB	Blood Brain Barrier
O_2	Oxygen

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