BIOCHEMICAL CHANGES RESULTING FROM ORGANOPHOSPHOROUS POISONING RELATED TO THE TYPE OF ORGANOPHOSPHOROUS COMPOUND

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ABSTRACT

Pesticide poisoning is a major public health problem in developing agricultural countries. Majority of pesticide poisoning cases are due to organophosphorous (OP) poisoning. It has become one of the leading causes of death in Sri Lanka. Diagnosis of OP poisoning is primarily based upon the signs and symptoms of suspected patients. Biochemical manifestations of acute OP poisoning were studied in a cohort of patients in relation to the type of OP poison ingested. Of the 19 patients, 14 patients developed features suggestive of acute cholinergic crisis, while rest of the patients developed intermediate syndrome. A simple, rapid and sensitive GC/NPD method was developed to identify the type of OP compound present in the gastric vomitus of OP intoxicated patients. The temporal profiles of red cell cholinesterase (RChE), serum butyrylcholinesterase (BChE), serum total creatine kinase (CK) and myocardial fraction of creatine kinase (CK-MB) were estimated to determine the relative susceptibility of those tissues to chlorpyrifos and dimethoate. A significant change in the activity of RChE was observed only in the dimethoate poisoned group whereas both chlorpyrifos and diemethoate poisoned groups showed significant recovery of serum BChE activity. Muscle injury was seen in both chlorpyrifos and dimethoate poisoned groups beginning from the day 1 of poisoning. Majority of patients seem to have parent OP compound in their serum or urine less than the minimum detection limits. Limitations of the GC/NPD method , the necessity of biological monitoring of metabolites of parent OP compounds by GC/MS methods and advantages of utilizing combinatorial approaches to diagnose OP poisoning is discussed.