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Differences between organophosphorus insecticides in human self-poisoning: a prospective cohort study. JArticle; Lancet Vol: 366 No.(9495) 2005_.1452-9pp

Abstract : Although more than 100 organophosphorus insecticides exist, organophosphorus poisoning is usually regarded as a single entity, distinguished only by the compound's lethal dose in animals. We aimed to determine whether the three most common organophosphorus insecticides used for self-poisoning in Sri Lanka differ in the clinical features and severity of poisoning they cause. We prospectively studied 802 patients with chlorpyrifos, dimethoate, or fenthion self-poisoning admitted to three hospitals. Blood cholinesterase activity and insecticide concentration were measured to determine the compound and the patients' response to insecticide and therapy. We recorded clinical outcomes for each patient. Compared with chlorpyrifos (35 of 439, 8.0%), the proportion dying was significantly higher with dimethoate (61 of 264, 23.1%, odds ratio [OR] 3.5, 95% CI 2.2-5.4) or fenthion (16 of 99, 16.2%, OR 2.2, 1.2-4.2), as was the proportion requiring endotracheal intubation (66 of 439 for chlorpyrifos, 15.0%; 93 of 264 for dimethoate, 35.2%, OR 3.1, 2.1-4.4; 31 of 99 for fenthion, 31.3%, 2.6, 1.6-4.2). Dimethoate-poisoned patients died sooner than those ingesting other pesticides and often from hypotensive shock. Fenthion poisoning initially caused few symptoms but many patients subsequently required intubation. Acetylcholinesterase inhibited by fenthion or dimethoate responded poorly to pralidoxime treatment compared with chlorpyrifos-inhibited acetylcholinesterase. Organophosphorus insecticide poisoning is not a single entity, with substantial variability in clinical course, response to oximes, and outcome. Animal toxicity does not predict human toxicity since, although chlorpyrifos is generally the most toxic in rats, it is least toxic in people. Each organophosphorus insecticide should be considered as an individual poison and, consequently, patients might benefit from management protocols developed for particular organophosphorus insecticides.