Letter

Management of severe organophosphorus pesticide poisoning

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We read with interest the paper by Sungar and Güven [1], which described a case series of organophosphorus pesticide (OP)-poisoned patients managed in their intensive care unit. It clearly demonstrates the difficulty in managing such patients in resource-poor areas [2]. However, we should like to query some issues in their management of OP poisoning and their use of pralidoxime.

We cannot understand their assessment of risk–benefit in the use of atropine. Their regimen of 0.02–0.08 mg/kg atropine as an infusion over 1 hour would provide a maximum of 5.6 mg atropine in a 70 kg person. Stopping atropine therapy '24 hours after atropinization' may cause problems with the continued release of fat-soluble OPs, such as fenthion, from the fat depot. Those authors also do not state the time it took for atropinization to be achieved; however, if patients received atropine for a mean of '3.4 ± 2.1 days', then the mean time to atropinization was 2.4 ± 2.1 days. This appears far too long. Few clinical toxicologists would disagree that full and early atropinization with 2 mg atropine stat followed by 2 mg every 5–15 min has few risks and obvious benefits [3].

Their use of intravenous diltiazem or propranolol for tachydysrhythmias associated with OP poisoning is troubling. Hypotension and cardiac dysrhythmias are significant problems in OP poisoning [3]. Do the authors have any evidence that the benefits of these negative inotropic drugs outweigh the risks in such patients?

The authors state that only one randomized controlled trial (RCT) has been carried out that assessed the efficacy of pralidoxime in OP poisoning. Unfortunately, the cited paper was a retrospective case series that compared the case fatality rate during a time when pralidoxime was not available in Sri Lanka with the rate at a time when it was, and as such is not a RCT [4].

We recently completed a systematic review of RCTs of pralidoxime that identified two small RCTs and two very small prospective studies [4]. The RCTs were carried out in Vellore, India, and assessed the value of 12 g pralidoxime given in an infusion over 3–4 days versus a 1 g bolus or placebo. The trials failed to show any benefit. However, recent World Health Organization guidelines [5] recommend far higher doses – at least 30 mg/kg bolus followed by an infusion of 8 mg/kg per hour. In practice, this becomes 2 g stat followed by 500 mg/h – a dose far higher than that used in the study of Sungur and Güven [1].

The authors also state that pralidoxime should not be used longer than 48 hours after ingestion. This may not be true for diethyl OPs. The time at which oxime administration is no longer useful depends on the rate of acetylcholinesterase ageing. *In vitro*, this occurs with a half-life of around 3 hours for dimethyl OPs and 33 hours for diethyl OPs. Taking four half-lives to be the latest that oximes can be effective, oximes may be useful for diethyl compounds when started up to 120 hours after ingestion [4,5].

Finally, we agree with Sungar and Güven that further controlled trials are required. We are now carrying out a large RCT in Sri Lanka in 1500 patients to test the efficacy of the dose of pralidoxime recommended by the World Health Organization.

Competing interests

None declared.

References

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OP = organophosphorus pesticide; RCT = randomized controlled trial.