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Efficacy and outcomes of lipid resuscitation on OP poisoning patients: a systematic review and meta-analysis

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Objective: Organophosphorus(OP) pesticides are still widely used in developing countries, leading to numerous accidental and suicidal poisonings each year. Lipid emulsion is commonly used in OP poisoning patients but few studies have been reported. Our meta-analysis aimed to assess the efficacy and outcomes of lipid resuscitation on OP poisoning patients.

Methods: A systematic search for relevant studies was conducted in Pubmed, EMBASE, MEDLINE, Cochrane Library and Chinese National Knowledge Infrastructure. Collected data was pooled using Revman5.3. Outcomes assessed include prognosis (cure rate and mortality rate), hepatic function [serum alanine aminotransferase (ALT), aspartate aminotransferase (AST), total bilirubin (TBIL)], serum acetylcholinesterase (AChE) level and respiratory function (rate of respiratory muscle paralysis).

Results: Seven randomized controlled trials (RCT) consisting of 630 patients meeting inclusion criteria were identified. Lipid emulsion helped to improve cure rate [Odd ratio (OR) = 2.54, 95%CI (1.33, 4.86), p=0.005] and lower the mortality rate [OR=0.31, 95%CI (0.13, 0.74), p=0.009]. Serum ALT, AST and total bilirubin (TBIL) in patients who underwent lipid resuscitation were lower than those in control groups [ALT, SMD=-1.52, 95%CI(-2.64,0.40), p=0.008; AST, SMD=-1.66, 95%CI(-3.15,0.16), p=0.03; TBIL, SMD=-1.26, 95%CI(-2.32,0.20), p=0.02]. Serum AChE level is increased in patients treated with lipid emulsion [SMD=2.15, 95%CI (1.60, 2.71), p<0.00001]. Rate of respiratory muscle paralysis is lower in patients undergoing lipid resuscitation than those in control groups [OR=0.19, 95%CI (0.05,0.71), p=0.01].

Conclusion: Based on the relatively low quality RCT reports in Chinese, lipid resuscitation seems likely to help to improve the clinical condition, hepatic function and prognosis of OP patients. Future multiple center and large sample RCTs are still needed.