Intravenous lipid emulsion to reverse acute drug toxicity in pediatric patients
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CRD summary
This review evaluated the use of intravenous lipid emulsion to treat acute-onset drug toxicity in paediatric patients. The authors concluded that treatment generally resulted in positive outcomes based on limited evidence from case reports. Although the authors' conclusion reflects the limited evidence presented, the reliability of the review methods is unclear.

Authors' objectives
To evaluate the use of intravenous lipid emulsion to treat acute-onset drug toxicity in paediatric patients.

Searching
PubMed, SCOPUS, and EMBASE were searched (search dates from 1960 to December 2012) for studies published in English. Search terms were reported. Reference lists of retrieved articles, together with those of three reviews, were searched for additional published and unpublished papers. Selected journals and conference proceedings were also searched.

Study selection
Eligible for inclusion were observational studies, case reports, and abstracts focusing on intravenous lipid emulsion to treat acute-onset drug toxicity in patients aged 18 years and younger.

In half of the included studies, intravenous lipid emulsion was used to treat toxicity after local anaesthetic use for a medical procedure (mostly bupivacaine); in the remaining studies, treatment was used to cover a range of non-anaesthetic medications ingested intentionally or unintentionally. Participants were aged from two days to 18 years. Most studies used intralipid (20%) as the lipid emulsion product; dosages across all products varied. The outcome of interest was toxicity reversal measured by various means.

The authors did not state how many reviewers selected the studies for inclusion.

Assessment of study quality
The authors did not report any quality assessment of included studies.

Data extraction
Data were extracted on toxicity reversal (from onset).

The authors did not state how many reviewers extracted the data.

Methods of synthesis
A narrative synthesis was presented.

Results of the review
Fourteen case reports were included in the review (two were abstracts).

Beneficial responses to intravenous lipid emulsion treatment was apparent in thirteen cases. The authors stated it was unclear whether intravenous lipid emulsion represented the main cause for recovery in all cases, although response was generally immediate following initiation of the treatment.

One patient developed hypertriglyceridaemia and pancreatitis several days after lipid emulsion therapy, but made a full recovery.

Authors' conclusions
The evidence for using intravenous lipid emulsion therapy to treat acute drug toxicity in paediatric patients was limited.
to case reports. Results from this review in neonates and adolescents showed generally positive outcomes.

**CRD commentary**
The review question was clear, and inclusion criteria were adequately specified to allow replication. A range of relevant data sources were searched and attempts were made to retrieve published and unpublished studies; language bias was a possibility. The authors did not report whether steps were taken to minimise error and bias in the review process.

Quality assessment of the included studies was not mentioned, but the impact of this may be minimal as the included studies were all case reports, generally considered to be less robust study designs. The authors acknowledged reporting bias within case reports as one of several potential limitations of the review.

Although the results reflect the limited evidence presented, the reliability of the review methods is unclear.

**Implications of the review for practice and research**

**Practice**: The authors did not state any implications for practice.

**Research**: The authors stated that further reporting of paediatric cases would guide the optimal use and safety profile of intravenous lipid emulsion for the emergent treatment of acute drug toxicity.

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