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Cost-assessment of the use of fomepizole for the treatment of toxic alcohol poisonings in Australian practice

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Objectives: Ethylene glycol and methanol poisonings are infrequent in Australia. Ethanol is the main treatment used but elsewhere fomepizole is commonly used. Fomepizole was approved in Australia in 2017 but its cost-effectiveness has not been assessed in this environment. An advantage of fomepizole is that it may allow ward (non-ICU)-based management and non-emergent initiation of intermittent haemodialysis (IHD). Since ethylene glycol is approximately 30% eliminated by the kidney, extracorporeal treatments (ECTRs) may not be needed. The cost-effectiveness of fomepizole in Australian practice was determined.

Methods: Costs for treating methanol and ethylene glycol poisonings in concentrations 30 to 150 mg/dL in patients weighing 70 or 100 kg with fomepizole were determined. Patients received IHD, continuous renal replacement therapy (CRRT) or no ECTR in the ward or ICU environment. Toxic alcohol elimination half-lives during treatments were obtained from the literature. IHD was costed in 2 hourly increments (minimum 4 hours) and CRRT and non-ECTR in 6 hourly increments (minimum 6 hours). The cost of IHD, CRRT, central venous access, fomepizole and ward and ICU bed admissions were based on current local estimates. The dosage was according to the product information, except during ECTR when 1 mg/kg/hour was used for both modalities. Key assumptions: (1) the only ECTR indication was enhanced elimination (early presentation in the absence of acidaemia), (2) treatments and dispositions were immediately available, (3) treatment continued until medical clearance from the toxic alcohol exposure (psychosocial and medical comorbidities not considered).

Results: For methanol, ward-based treatment with IHD is 55-75% of the cost of ICU-based treatment with CRRT which is the next cheapest, the difference being more marked at higher concentrations. ICU-based treatment with CRRT cost similar to ward-based management without ECTR in 70 kg patients with concentrations ≤40 mg/dL, but cheaper for higher concentrations. For patients weighing 100 kg, ICU admission for ECTR was always cheaper than ward-based management without ECTR.

For ethylene glycol, ward-based treatment without ECTR was cheaper or similar for concentrations ≤50 mg/dL, beyond which ward-based treatment with IHD was approximately 75-95% of the cost of ward-based treatment without ECTR, the difference being more marked at higher concentrations and heavier patients. Ward-based management without ECTR was 65-80% of the cost of ICU-based management with CRRT, the difference being more marked at higher concentrations and lighter patients.

Conclusions: Fomepizole is potentially cost-effective in certain conditions in Australian practice. Comparative costing data about ethanol are lacking.