Optimising drug dosing in patients receiving extracorporeal membrane oxygenation

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Abstract

Optimal pharmacological management during extracorporeal membrane oxygenation (ECMO) involves more than administering drugs to reverse underlying disease. ECMO is a complex therapy that should be administered in a goal-directed manner to achieve therapeutic endpoints that allow reversal of disease and ECMO wean, minimisation of complications (treatment of complications when they do occur), early interruption of sedation and rehabilitation, maximising patient comfort and minimising risks of delirium. ECMO can alter both the pharmacokinetics (PK) and pharmacodynamics (PD) of administered drugs and our understanding of these alterations is still evolving. Based on available data it appears that modern ECMO circuitry probably has a less significant impact on PK when compared with critical illness itself. However, these findings need further confirmation in clinical population PK studies and such studies are underway. The altered PD associated with ECMO is less understood and more research is indicated. Until robust dosing guidelines become available, clinicians will have to rely on the principles of drug dosing in critically ill and known PK alterations induced by ECMO itself. This article summarises the PK alterations and makes preliminary recommendations on possible dosing approaches.

Keywords

Author Keywords: Extracorporeal membrane oxygenation (ECMO); pharmacology; pharmacodynamics (PD); antibiotics; sedatives

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