Empirical antibiotics for prevention of nosocomial infection in circulatory arrest patients resuscitated with extracorporeal membrane oxygenation

Objective
We aimed to investigate the impact of nosocomial infections (NIs) on patients who underwent extracorporeal cardiopulmonary resuscitation (ECPR).

Methods
We retrospectively analyzed the rate, type, pathogens, outcomes, and risk factors of NIs that developed in adult patients under ECPR at our institution from January 2002 to January 2022.

Results
Among 105 of study patients (median age 58.59 [IQR 46.53–67.32]), 57 (54.29%) patients developed NIs during their ECMO course, with the incidence rate 135.91 infections per 1,000 ECMO days and 40.06 in multidrug-resistant (MDR) infection. Ventilator-associated pneumonia was the most common type of NIs, followed by blood stream infection (73.68% and 17.89%, respectively). Multivariate Cox regression analysis revealed empirical antibiotics with P. aeruginosa coverage was a protective factor for nosocomial infection (HR 0.518, 95% CI 0.281–0.953, P =.034, Fig.1) Peak inspiratory pressure setting at 24 h after ECPR > 28 cmH2O was a prognostic factor for hospital mortality (HR 2.775, 95% CI 1.355–5.685, P =.005). Apache score II ≥ 24 (HR 6.443, 95% CI 1.380–30.088, P =.018) was a risk factor for developing MDR NIs.

Conclusions
In ECPR patients, empirical antibiotic treatment which cover P. aeruginosa is associated with decreased incidence of NIs, while Apache score II ≥ 24 is a risk factor for MDR infections. In the modern era of antibiotic therapy, the development of NI does not increase hospital mortality among ECPR patients.

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Freedom from ECMO-related NIs (%) vs. Duration from ECPR to NIs (days)

- **With PsA cover (n = 61)**
- **Without PsA cover (n = 38)**

**Number of patients**

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*P* = .006