



# Investigation of Healthcare-Associated Infections of Hemodialysis Patients - Ceará, Brazil, March to May 2022

Felipe Cardoso<sup>1</sup>, Marcos Lima<sup>1</sup>, Francisca Aline Freitas Coelho<sup>2</sup>, Karene Ferreira Cavalcante<sup>2</sup>, Virma Machado<sup>2</sup>, Arminda Evangelista de Moraes Guedes<sup>2</sup>, Agnes Oliveira Costa e Silva<sup>3</sup>, Diana Karla Muniz Vasconcelos<sup>4</sup>, Magda Machado de Miranda Costa<sup>5</sup>, Danniely Carolinne Soares da Silva<sup>1</sup>

Authors affiliations: <sup>1</sup>Field Epidemiology Training Program - Brazil (EpiSUS Avançado), Department of Public Health Emergencies, Brazilian Ministry of Health, <sup>2</sup>State of Ceará Department of Health, <sup>3</sup>Vale do Acaraú State University, <sup>4</sup>Institute of Health and Hospital Management, <sup>5</sup>Brazilian Health Regulatory Agency

Corresponding author: Felipe Daniel Cardoso: [felipe.cardoso@saude.gov.br](mailto:felipe.cardoso@saude.gov.br)

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## Abstract

**Background:** Hemodialysis is the most widely used renal replacement therapy. Patients undergoing hemodialysis have higher mortality and infection rates than the general population. On May 15, 2022, an increase in the number of dialysis patients with symptoms of bacteremia was reported in a hospital in Ceará, Brazil. Thus, we aimed to identify the existence of an outbreak and associated risk factors. **Population and Methods:** A descriptive study followed by an unmatched case-control study were conducted from March to May, 2022, in dialysis patients at that healthcare facility. A case was a patient with a positive blood culture collected within 24 hours after development of fever, chills and/or tremors during a hemodialysis session. Controls were patients without symptoms during hemodialysis. Sociodemographic, clinical and risk factor data were obtained from medical records. Descriptive analysis, odds ratios (OR) and 95% confidence intervals (CI) were estimated to identify associated factors. **Results:** Nineteen cases and 70 controls were identified. Cases were distributed from March 27th through May 28th. Ten species of bacteria were isolated, of which *Pseudomonas aeruginosa* and *Ochrobactrum anthropi* were present in five (26.3%) and four (21.1%) cases, respectively. Fifteen (78.9%) cases were hospitalized in the medical clinics and 10 (52.6%) presented signs of infection at the catheter insertion site. These were identified as risk factors, with ORs of 19.8 (CI=3.7-107.2) and 76.7 (CI=8.8-671.4), respectively. Furthermore, two reverse osmosis machines were associated with the development of bacteremia, with ORs of 5.7 (CI=1.26-25.78) and 20.3 (CI=1.9-217.3). **Conclusion:** We were not able to confirm the existence of an outbreak. An association between bacteremia and the hemodialysis catheter was found, possibly due to fragilities in the healthcare practices. This is supported by the numerous etiological agents identified, by the propagated mode of spread indicated in the epicurve, and by the emergence of new cases after maintenance of the dialysis and osmosis machines. The association of bacteremia with hospitalization in the medical clinic suggests that specific characteristics of this sector may affect the outcome, such as personnel and healthcare procedures. Audits tools and checklists from the Brazilian Health Regulatory Agency guidelines were recommended to enforce practices for infection prevention.

**Key words:** healthcare associated infections; hemodialysis; universal precautions; Brazil.

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