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Evaluating 2-Hour versus 4-Hour Intradialytic Blood Cultures In Diagnosing Catheter-Related Bloodstream Infection

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Objectives : Vascular access stands as the Achilles' heel of hemodialysis (HD) therapy, with catheter-related bloodstream infection (CRBSI) being a major complication. This study seeks to assess if intradialytic blood cultures can effectively replace peripheral blood cultures for diagnosing CRBSI.
Methods : This single-centre, cross-sectional, prospective study involved HD patients with indwelling dialysis catheters admitted for suspected CRBSI. Blood cultures were collected from the central catheter hub and peripheral vein following the IDSA guidelines. Additionally, two sets of blood cultures were obtained from the dialysis circuit at the 2nd and 4th hour of HD. Sensitivity, specificity, and accuracy were calculated using peripheral vein cultures as the reference standard. Baseline demographics, clinical parameters, antibiotic therapy, and medication lists were recorded.
Results : We enrolled 200 patients treated for suspected CRBSI, with a median age of 64 years and an almost equal gender ratio. The majority had tunneled dialysis catheters (60.5%). Using IDSA criteria and a combination of central/intradialytic 2-hour cultures, 48% and 40% of patients were confirmed to have CRBSI, respectively. The 2nd-hour intradialytic blood culture demonstrated higher sensitivity and accuracy (sensitivity: 72.38%, specificity: 86.32%, accuracy: 78%) but slightly lower specificity than the 4th-hour intradialytic culture (sensitivity: 65.71%, specificity: 88.42%, accuracy: 76.5%). The agreement of organisms cultured from intradialytic versus peripheral vein cultures was 100% at both the 2nd and 4th hour of HD. Gram-positive organisms predominated (58%), followed by gram-negative organisms (35%). Ten percent of patients succumbed to mortality following the episode of CRBSI.
Conclusions : The use of intradialytic culture in lieu of peripheral blood culture for diagnosing CRBSI is justifiable. It not only ensures an adequate amount of blood sampling but is also a painless and vein-preserving procedure. Thus, either intradialytic alone or in combination with central culture may be an option for culture confirmation in the dialysis population.