

The Effect of Heparin Lock and Topical Antibiotics on Catheter-Related Bloodstream Infection Events in Chronic Kidney Disease with Short-Term Double-Lumen Catheter Patients

Hery Siswanto¹, Muhammad Nuralim Mallapasi^{2,3}, Mulawardi¹, Jayarasti Kusumanegara^{2,3}, Umar Usman², Burhanuddin Bahar⁴, Haerani Rasyid⁵, Muhammad Faruk¹

¹Department of Surgery, Faculty of Medicine, Hasanuddin University, Makassar, Indonesia

²Division of Thoracic and Cardiovascular Surgery, Department of Surgery, Faculty of Medicine, Hasanuddin University, Makassar, Indonesia

³Division of Thoracic and Cardiovascular Surgery, Department of Surgery, Wahidin Sudirohusodo Hospital, Makassar, Indonesia

⁴Department of Biostatistics, Public Health Faculty, Hasanuddin University, Makassar, Indonesia

⁵Department of Internal Medicine, Faculty of Medicine, Hasanuddin University, Makassar, Indonesia

Abstract

Introduction: Catheter-related bloodstream infection (CRBSI) is a complication that can occur in hemodialysis patients, especially when a double-lumen catheter (DLC) is used. This study aimed to investigate the effect of heparin lock and topical antibiotics on the incidence of CRBSI in chronic kidney disease (CKD) patients using DLC.

Methods: This randomized, pre–post-control design study was conducted on adult patients undergoing routine hemodialysis. Patients were divided equally into two groups. In addition to the standard protocol, the first group was given a combination therapy of heparin lock (20 mg/mL heparin left in DLC for 4 hours) and mupirocin 5% cream at the DLC exit area, and the second group was only given a single heparin lock. The diagnosis of CRBSI was made based on the Infectious Diseases Society of America criteria. Numerical data were analyzed using the t-test and Mann–Whitney U test. Categorical data were analyzed using the chi-square test. A p-value of <0.05 was considered significant.

Results: Of the 40 patients (20 male and 20 female) in this study, 62.5% were between the ages of 41–60 years. CRBSI was found in 10 patients (25%), with a higher incidence in the single-therapy group (8 cases; $p < 0.05$). The single-therapy group also tended to have CRBSI faster, with a hazard ratio of 7.61.

Conclusion: The application of the topical antibiotic mupirocin might be effective in reducing the risk of CRBSI in CKD patients using DLC.

Key words: vascular access, double-lumen catheter, catheter-related bloodstream infection, insertion site, randomized-controlled trial