Central venous catheters (CVCs) are necessary for critically ill patients, including those with hematological malignancies. However, CVC insertion is associated with inevitable risks for various adverse events” Imataki et al (2019).

Abstract:

BACKGROUND: Central venous catheters (CVCs) are necessary for critically ill patients, including those with hematological malignancies. However, CVC insertion is associated with inevitable risks for various adverse events. Whether ultrasound guidance decreases the risk of catheter-related infection remains unclear.

METHODS: We observed 395 consecutive CVC insertions between April 2009 and January 2013 in our hematological oncology unit. Because the routine use of ultrasound guidance upon CVC insertion was adopted based on our hospital guidelines implemented after 2012, the research period was divided into before December 2011 (early term) and after January 2012 (late term).

RESULTS: Underlying diseases included hematological malignancies and immunological disorders. In total, 235 and 160 cases were included in the early- and late term groups, respectively. The median insertion duration was 26 days (range, 2-126 days) and 18 days (range, 2-104 days) in the early- and late term groups, respectively. The internal jugular, subclavian, and femoral veins were the sites of 22.6, 40.2, and 25.7% of the insertions in the
early term group and 32.3, 16.9, and 25.4% of the insertions in the late term group, respectively. The frequency of catheter-related bloodstream infection (CRBSI) was 1.98/1000 catheter days and 2.17/1000 catheter days in the early- and late term groups, respectively. In the subgroup analysis, the detected causative pathogens of CRBSI did not differ between the two term groups; gram-positive cocci, gram-positive bacilli, and gram-negative bacilli were the causative pathogens in 68.9, 11.5, and 14.8% of the cases in the early term group and in 68.2, 11.4, and 18.2% of the cases in the late term group, respectively. In the multivariate analysis to determine the risk of CRBSI, only age was detected as an independent contributing factor; the indwelling catheter duration was detected as a marginal factor. A significant reduction in mechanical complications was associated with the use of ultrasound guidance.

CONCLUSIONS: Ultrasound-guided CVC insertion did not decrease the incidence of CRBSI. The only identified risk factor for CRBSI was age in our cohort. However, we found that the introduction of ultrasound-guided insertion triggered an overall change in safety management with or without the physicians’ intent.

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