Dysfunction of indwelling central venous catheters (CVC) due to tissue ingrowth or clotting is common. The study objective was to determine if the oral anticoagulant rivaroxaban (RIVA) improved CVC patency and inflammation in mice” Terry et al (2016).

Abstract:

INTRODUCTION: Dysfunction of indwelling central venous catheters (CVC) due to tissue ingrowth or clotting is common. The study objective was to determine if the oral anticoagulant rivaroxaban (RIVA) improved CVC patency and inflammation in mice.

MATERIALS AND METHODS: Polyurethane catheters (0.5cm length) were placed unilaterally into the external jugular vein (EJV) of mice, which subsequently underwent daily gavage with either vehicle or RIVA (5mg/kg). CVC patency, as assessed by B-mode and Doppler ultrasound, and hematocrit were measured at 3, 7, 14 or 21days (n=8-11 mice/group/time-point). Plasma monocyte chemotactic protein-1 (MCP-1) levels were assessed by ELISA, EJV matrix metalloproteinase-9 (MMP-9) levels by western immunoblotting, and cell proliferation (anti-Ki67), macrophage infiltration (anti-MAC387) by immunostaining of EJV tissues.
RESULTS AND CONCLUSIONS: CVC patency was significantly improved in RIVA-treated mice compared to vehicle-treated (93.8% vs. 62.9%) with the probability of patency in RIVA-treated mice being 1.5 times that in vehicle-treated (relative risk [RR], 1.50, 95% confidence interval [CI], 1.14-1.95, p=0.002). Plasma MCP-1 levels were lower in RIVA-treated mice vs. vehicle-treated at 21 days (389±260 vs. 804±292ng/mL, p=0.005). Cell proliferation was less at day 7 in EJV from the RIVA-treated mice than vehicle-treated (5.0%±3.0 vs. 11.5%±3.6, p=0.0006), as were MMP-9 protein levels. There were no differences in hematocrit between vehicle and RIVA-treated groups at any time point. In conclusion, these data indicate RIVA lowers inflammation and improves CVC patency in a mouse model, supporting future studies to assess RIVA for improving CVC patency in patients.

Reference:


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