The frequency of phlebitis was lower in the polyurethane, in which the catheter was placed at lower angle, almost parallel to the vessel" Tanabe et al (2016).

Abstract:

INTRODUCTION: Peripheral intravenous catheters (PIVCs) are frequently removed due to phlebitis. We hypothesized that catheters made of polyurethane, which is more flexible than Teflon, would decrease phlebitis, and that flexibility could be estimated by measuring the catheter-tip angle. Ultrasonography in two groups of patients with different catheter types was then used to compare catheter-tip angles and phlebitis.

METHODS: Observational studies were carried out at a medical ward in a university hospital. Infusion therapy was administered to one group of patients in 2014 using Teflon catheters (control group, n = 200), and to another group of patients in 2015 using polyurethane catheters (investigational group, n = 207). The symptoms were assessed according to a scale developed by the Infusion Nurses Society. Long-axis ultrasonography images taken immediately before catheter removal were used to measure the angle between the central line of the catheter within 2 mm from the distal point and a tangent to the vessel wall.

RESULTS: There were no significant differences between the two groups with respect to sex, age, and medical diagnosis. In the control and investigational groups, the rates of phlebitis were 37% (73/200) and 17% (36/207), respectively ($p<0.001$). The median angles of the catheter tip were 7.8° and 4.1°, respectively ($p<0.001$). Phlebitis occurred more frequently when the catheter-tip was placed at angle >5.8°.

DISCUSSION: The frequency of phlebitis was lower in the polyurethane, in which the catheter was placed at lower angle, almost parallel to the vessel. Our results will aid in developing new catheters and in improving PIVC-securement techniques.

Reference:

Tanabe, H., Murayama, R., Yabunaka, K., Oe, M., Takahashi, T., Komiyama, C. and Sanada, H. (2016) Low-angled peripheral intravenous catheter tip placement decreases phlebitis. The Journal of Vascular Access. September 20th. .

doi: 10.5301/jva.5000601.

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