

We were able to confirm intravascular location of peripheral intravenous catheters using the color-flow injection test in pediatric patients” Gautam et al (2017).

Abstract:

BACKGROUND: The incidence of infiltration and extravasation when using peripheral intravenous catheters is high in pediatric patients. Due to the lack of a gold standard test to confirm intravascular location of a peripherally placed intravenous catheter, we introduce a novel method, the color-flow injection test to assess the intravascular location of these catheters. For the color-flow injection test, 1 mL of normal saline was injected within 2 seconds in the distal intravenous catheter and changes in color-flow via ultrasonography were observed at the proximal draining veins. The primary objective of the study was to demonstrate feasibility of the color-flow injection test.

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METHODS: A prospective study was conducted on children <18 years old undergoing general anesthesia. All peripheral intravenous catheters were subject to the color-flow injection test and standard confirmation tests.

RESULTS: Out of the 100 patients enrolled, 22 patients came to the operating room with preexisting peripheral intravenous catheters. Intraoperatively, 105 attempts were made on 78 patients of which 27 catheters were considered as infiltrated during their placement. A final set of 100 catheters were considered for intraoperative usage after they had passed at least one of the standard confirmatory tests. For the color-flow injection test, the ideal sites for ultrasound evaluation of proximal draining veins were the axillary veins and femoral veins. The color-flow injection test was positive in 93 of the 100 catheters with color-flow changes noticed in the proximal veins during the saline injection. Of the 100 catheters, infiltration around seven catheter sites were observed within 2 hours of intraoperative usage and the color-flow injection test was negative in these seven catheters. The color-flow injection test was also negative in the 27 catheters that had infiltrated during their

placement. The color-flow injection test was sensitive at 100% [95% confidence interval (CI)=95-100] and specific at 100% (95% CI=56-100) to indicate intravascular location.

CONCLUSION: We were able to confirm intravascular location of peripheral intravenous catheters using the color-flow injection test in pediatric patients. The test can lead to early recognition of malfunctioning peripheral intravenous catheters and decrease rate of infiltration-extravasation injuries associated with their use.

Reference:

Gautam, N.K., Bober, K.R. and Cai, C. (2017) Introduction of color-flow injection test to confirm intravascular location of peripherally placed intravenous catheters. Paediatric Anaesthesia. June 15th. .

doi: 10.1111/pan.13188.

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