

Evaluation of unmodifiable and potentially modifiable factors affecting peripheral intravenous device-related complications in neonates: a retrospective observational study.

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Objective

Infants in neonatal units benefit from dependable peripheral intravenous access. However, peripheral intravenous access exposes infants to high rates of clinically minor and serious complications. Despite this, little is known about the interplay of risk factors. The aim of this study was to assess the incidence and evaluate the interactions of risk factors on the occurrence of peripheral intravenous complications in a neonatal population.

Design and Setting

This was a retrospective observational study. Setting The study was performed on the neonatal intensive care unit of the Women’s Wellness and Research Center, Hamad Medical Corporation, Qatar, as a single-site study. Participants This study included 12978 neonates who required intravenous therapy.

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Data are represented as mean and its SD or as absolute number and percentages, which were calculated as a proportion within the cell. Device dwell time is represented in hours. Data of 64 participants are missing.

Reason for removal of the peripheral intravenous catheter	Dwell time (hours)	Total Cohort (12914)
PIVIE*	31±24	5159 (40%)
Phlebitis	29±19	1590 (12%)
Occlusion	41±29	527 (4%)
Accidental removal	23±25	286 (2%)
Discolouration	22±20	65 (1%)
Death or transfer out to another facility	17±26	142 (1%)

***PIVIE, peripheral intravenous intravasation and extravasation.**

Results

A mean dwell time of 36±28 hours was recorded in participants with no complications, whereas the mean dwell time was 31±23 hours in participants with an indication for premature removal of the peripheral intravenous catheter (p<0.001, t=11.35). Unplanned removal occurred in 59% of cases; the overall complication rate was 18 per 1000 catheter days. Unmodifiable factors affecting PIVC dwell time include lower birth (HR=0.23, p<0.001) and current body weight (HR=1.06, p=0.018). Cannulation site (HR=1.23, p<0.001), the inserted device (HR=0.89, 0.84 to 0.94, p<0.001) and the indication for intravenous treatment (HR=0.76, p<0.001) were modifiable factors.

Conclusion

Most infants experienced a vascular access-related complication. Given the high complication rate, PIVCs should be used judiciously and thought given prior to their use as to whether alternate means of intravenous access might be more appropriate.