Abstract:

OBJECTIVE – The goal was to determine the interchangeability of peripheral venous catheter (PVC) and venipuncture blood sampling (BS).

METHODS – Paired blood samples from hospitalized children were obtained through venipuncture and from existing PVCs, following discard of 2 mL of blood. Comparisons of 9 complete blood count indices (white and red blood cell counts, hemoglobin and hematocrit levels, mean corpuscular volume, mean corpuscular hemoglobin level, red blood cell distribution width, platelet count, and mean platelet volume) and 5 basic chemical analysis indices (sodium, potassium, glucose, chloride, and urea levels) were performed, and hemolysis was documented.

RESULTS – Irrespective of gauge, blood samples were obtained successfully from 40 (85.1%) of 47 PVCs, with no abnormal hemolysis. BS through venipuncture took longer than BS from PVCs (175.8 ± 229.6 vs 104.5 ± 53.4 seconds; P = .053) and was associated with significantly more distress/crying (73.1% vs 0%; P < .001). There were no significant differences between venipuncture and PVC samples (paired t test). Twenty-one (6%) of 348 pairs analyzed with the Clinical Laboratory Improvement Amendment standards fell outside
the range of acceptable variance (8 of 21 aberrations were attributed to glucose measurements). Bland-Altman analysis indicated that, with the exclusion of glucose measurements, BS from PVCs is reliable, with 29 (6.5%) of 448 pairs exceeding the limits of agreement. Of those, 9 cases were clinically significant, but none would have altered clinical management.

CONCLUSIONS – PVC sampling was shown to be a pain-reducing method that can be used for children for selected basic analytes. The findings for glucose were unreliable.