



#IVTEAM #Intravenous literature: Repa, A., Mayerhofer, M., Cardona, F., Worel, N., Deindl, P., Pollak, A., Berger, A. and Haiden, N. (2013) Safety of Blood Transfusions Using 27 Gauge Neonatal PICC Lines: An in vitro Study on Hemolysis. Klinische Pädiatrie. October 24th. .

Abstract:

Blood transfusions are required by the majority of extremely premature infants. Packed red blood cells (PRBCs) are usually applied via simple peripheral cannulas. In situations where no peripheral venous access is achievable, 27 Gauge (G) neonatal PICC lines – that are ideally exclusively dedicated to application of parenteral nutrition – may represent a useful alternative access for PRBC transfusions. However, transfusion via small scaled catheters may damage PRBCs and lead to hemolysis. We here evaluate whether transfusion of irradiated PRBCs via 27 G PICC lines leads to hemolysis in vitro. Experimental transfusions of gamma-irradiated PRBCs were performed at increasing velocities (2.5, 3.7, 5 ml/h; full force manual push approximating 30 ml/h) via 27 G PICC lines of 20 and 30 cm length. Parameters of hemolysis (lactate dehydrogenase, potassium and free hemoglobin) were measured from the supernatants of transfused PRBCs and the percentage of hemolysis was calculated. Potassium and lactate dehydrogenase after transfusion at increasing velocities did not differ significantly from negative controls. Free hemoglobin levels showed a small but significant increase at the slowest transfusion speed (2.5 ml/h) using the 30 cm 27 G PICC line, with a relative hemolysis of only 0.13%. A manual push (approximating 30 ml/h) showed no significant changes of parameters from baseline. We conclude that transfusion of gamma-irradiated PRBCs using a 27 G neonatal PICC line does not cause clinically relevant hemolysis in vitro. Clinical studies are needed to confirm the feasibility and safety of the approach in vivo.

