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Papaverine for Ischemia Following Peripheral Arterial Catheterization in Neonates

11 Extremely low birth weight neonates who developed skin discoloration after peripheral arterial catheterization were given intra-arterial papaverine before the removal of arterial line. The skin color turned normal in all these neonates and none developed residual damage. In 3 neonates who could not receive papaverine, one developed gangrene of fingers. .

Keywords: *Arterial cannulation, complications, neonate, Vasospasm.*

Vascular spasm is a common complication of arterial catheterization, and is usually temporary and reversible [1]. Heparin and nitroglycerine (NTG) ointments have been used with varied success [2,3]. Papaverine is used in cardiac patients to relieve arterial spasm, and also to prolong the patency of arterial catheters in preterm neonates [4]. We retrospectively analyzed records of 14 extremely low birth weight (ELBW) neonates who developed skin discoloration following peripheral artery cannulation. Vasospasm was defined as complete perfusion recovery within 4 hours, thromboembolism as any discoloration of the skin not recovering within 4 hours, and residual damage as events leading to gangrene or loss of function of the extremity.

In the study period from January 2012 to December 2014, 47 ELBW neonates required 54 peripheral arterial line placements, 14 developed discoloration requiring arterial line removal. These infants were given intra-arterial papaverine before the removal of arterial line (6 posterior tibial and 5 radial) provided it was patent, and NTG patch was applied subsequently. The dose of papaverine used was 1 mg/kg [5, 6] diluted with 0.9% saline (1 mg: 1 mL), and infused over 5-10 minutes. Eleven neonates (gestational age 26-31 weeks; weight 0.56-0.98 kg) received intra-arterial papaverine. The skin color became normal in six neonates within 4 hours of removal of arterial lines, and in the remaining five, it normalized over next few days; none of these neonates developed residual damage. Three neonates could not receive papaverine because of line block; two of them achieved normal skin color and one developed gangrene of fingers. The

limitation of present study include: retrospective analyses, no control group, use of another co-intervention (NTG) and a small sample size. Also, doppler studies were not performed to confirm ischemia/vasospasm.

Papaverine is an opium alkaloid with vasodilatory and spasmolytic action, due to its inhibition of oxidative phosphorylation and calcium flux, during muscle contraction. An earlier study demonstrated efficacy of papaverine in prolongation of patency of arterial catheters without an increase in hypotension and intraventricular hemorrhage, even in preterm neonates [4]. It seems that papaverine is also effective in preventing residual damage in arterial catheterization-induced ischemia in ELBW neonates. These preliminary findings need to be confirmed by well-designed controlled studies.

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