A PRESENTATION ON A NOVEL TECHNIQUE FOR PERIPHERAL ARTERIAL LINE PLACEMENT IN PRETERMS – use of a modified Seldinger technique.

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Background: After the early neonatal period, the only way to invasively monitor the blood pressure in neonates is by a peripheral arterial line (PAL). No commercial kits for arterial catheterisation are available for use in infants <1kg. In a recent survey of 193 neonatal practitioners, 89% preferred 24G cannulas to catheterise peripheral arteries. 93% use a direct puncture technique (with a self estimated success rate of 61%). 72% reported their most common reason for failure to be the inability to advance the catheter after puncturing the artery. Seldinger technique uses a guidewire to thread a catheter into the artery and helps to overcome the problems caused by arterial spasm¹.

Aim: To evaluate the success rate of the Micro Seldinger Technique(MST) using a 24G needle, guide wire available with 2Fr MST kits (Vygon, Germany), 24G cannula (BD, Sweden) and transillumination using orange light (Stihler Electronic, Germany) for PAL placement in preterm babies in need of invasive blood pressure monitoring.

Method:

- Clean and drape and follow sterile precautions
- Allen test to check for collateral circulation
- Orange/yellow diaphanoscopy light used to visualise the artery
- 24G needle used to puncture the artery, followed by introduction of the guide wire
- Leaving the guidewire in place, remove the needle
- Thread the 24G IV cannula catheter (without needle) over the guidewire into the artery. This does not require the use of dilator as the needle used to puncture has the same diameter(24G)
- Remove the guidewire and secure the cannula (PAL)

Patients, Operator and Results

- 12 newborn babies
- Mean weight at insertion - 1138 grams (610-2250 grams)
- Mean gestation at insertion - 30+1weeks(25 weeks+4 days- 33 weeks+2 days)
- Mean age at insertion: -20.3 days (range- 2-53 days)
- Single operator
- Success rate: Successful procedure in 100% of the babies with 1 re-attempt on the same artery in 2 babies (85% success rate).

Fig. 1: Transillumination using orange light

Fig. 2: Arterial puncture using 24 G needle

Fig. 3: Guide wire in situ, after the removal of needle

Fig. 4: 24G cannula catheter being threaded

Limitations

- All the procedures done by a single senior registrar
- No comparison of success rate by the conventional direct puncture technique

CONCLUSION

Peripheral arterial cannulation combining transillumination and Micro Seldinger Technique is a promising novel method for arterial cannulation, yielding high success rate. A study with a larger number of patients treated by a wider variety of practitioners is required to further assess the efficacy, safety and transferability of this new technique.