

Intra-arterial induction for emergency intubation— Should we use?

Sir,

Although accidental and intentional use of intra-arterial (IA) route is described in literature, IA induction is not yet reported from the emergency department (ED) for intubation.^[1,2] We are sharing two interesting cases (one adult and one child), where we used IA induction of anesthesia for emergency intubation as we faced difficulty in getting intravenous access. The patients' family reviewed this report and gave written consent for publication.

A 23-year-old obese male presented to ED with breathlessness (acute respiratory distress syndrome). His arterial blood gas showed severe hypoxia (PO₂ 50 mmHg) despite oxygen therapy (50%). But, due to obesity and peripheral edema, we were not able to get venous access. External jugular veins bilaterally were also tried. A 20-gauge cannula, however, could be inserted in his left radial artery successfully. We injected 50 mg of preservative-free lignocaine, 150 mcg fentanyl, and 100 mg succinylcholine through the IA cannula. Cannula was flushed with 50 ml heparinized (1000 U) saline immediately.

A 6-year-old male child presented to ED with hepatic encephalopathy and breathlessness, requiring urgent airway protection. Repeated attempts of venous cannulation failed even by pediatric anesthetist. A 20-gauge cannula was accidentally inserted in the right brachial artery while searching for antecubital vein. We injected 20 mg of preservative-free lignocaine, 50 mcg fentanyl along with 20 ml of heparinized (500 U) saline this time.

Both the patients' trachea could be successfully and safely intubated within a minute. After intubation, central venous catheters (in the right internal jugular vein) were placed in priority with ultrasound guidance in both the patients. We palpated all peripheral arterial pulses of involved hands and compared with other hand arterial pulses. There were no color change or temperature differences also in the involved hands in both of them. Serial Doppler studies of involved vessels could be done for both the patients. They always revealed normal blood flow. There were no sequelae of IA injection during their stay in hospital even also in a follow-up (3 months).

Accidental IA injection of sedative-hypnotic drugs are well reported in literature.^[1] Even intentional induction of anesthesia using IA route is increasingly reported from pediatric operation theatre.^[2] Keeping these facts

in our mind, we used IA route in emergency situation. In adults, if intravenous access is difficult or not available, intramuscular, ultrasound-guided central venous access, and intra-tracheal injections are the options.^[1-3] Ultrasound-guided central venous cannulations are time consuming and needs expertise and may not help in emergency situations. Drugs effects for intramuscular or intra-tracheal injections are not reliable (depends upon site of injection and patient's hemodynamic status).^[4] In emergency, IA route is less time-consuming than central venous access (much less invasive also) and drugs effects are more reliable than intramuscular or intra-tracheal injections.

In addition, intra-osseous route can solve the problems of emergency access in pediatric emergency situation.^[2,3] However, it needs expertise with instrument and has "difficult to maintain" issues.^[2] Even in trained operators, the failure rate is as high as 16%.^[4]

Tissue necrosis and extremity ischemia following IA injection labels use of this route very debatable.^[1,5] Vasospasm, intravascular thrombosis, and chemical endoarteritis are the proposed pathophysiological mechanism for those morbidities.^[1] Different case reports reported that water soluble drugs and drug's with pH closer to arterial blood pH may be used through IA route.^[1,2] We used aqueous solution of fentanyl and succinylcholine. Prophylactically, we used lignocaine and heparinized saline to reduce vessel spasm and thrombosis.^[1]

Emergent condition forced us to use IA route for intubating two patients. Although, in our cases intubation was uneventful, safety profile of IA route could not be certified. IA injections safety needs further research. We decided to use IA route only in desperate emergent conditions. Our view is for prophylactic use of preservative-free lignocaine and diluted heparin to reduce IA thrombosis risk.

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