LETTER TO THE EDITOR

Intraosseous access over central venous or peripheral venous line as an initial means of resuscitation- A possible measure for improving outcomes of cardiac arrests

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Madam, advanced Cardiac Life Support (ACLS) guidelines recommend obtaining immediate vascular access as a part of resuscitation protocol. This can be obtained via a central line, peripheral line or intraosseous line. The use of peripheral and central line is the usual practice with intraosseous line limited to paediatric age group[1] and unsuccessful attempts to use peripheral or central line.[2]

Intraosseous access has some advantages over the other two methods. Obtaining peripheral IV line access could be difficult in patients with low intravascular volume and intravenous drug abusers.[3] Central line although has many benefits, it is more time consuming which delays the delivery of drugs and fluids and is accompanied by wide range of complications as compared to the other two methods. The average time for intra osseous and central line placement according to one study were 2.3±0.8 and 9.9±3.7 minutes respectively with a $P < 0.001$[4] which can make a significant difference in emergent settings where immediate delivery of drug impacts mortality.

Eventhough Studies have failed to prove the long term survival benefit of any vasopressor in cardiac arrest patients, the short term survival benefit of early administration of epinephrine is promising.[5] Therefore intraosseous line being a very handy vascular access ensures the delivery of these life saving medication easy and effective.

Very few immediate complications are reported with intraosseous cannulation, which mainly includes: extravasation, fracture of cannulated bone, compartment syndrome and fat emboli with most of the trials reporting none of these complications.[6] Osteomyelitis and Bone necrosis continues to be the most feared long-term complication of intraosseous cannulation, however, their reported incidence in children is 0.6%[7] or less. Another study that included the data of all age groups reported incidence of osteomyelitis in 0.4% of population.[8]

We recommend intraosseous cannulation in adult patients with cardiac arrest instead of being limited to paediatric population or inability to obtain intravenous access, should be considered as an initial procedure of choice during resuscitation measures because of the afore mentioned less time to administration of vasopressor medications, less re-attempts and failure rates. What is required at this time is further refinement of the technique, easy availability of equipments and longer prospective studies that can identify the population who can get the maximum advantage from this measure.

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References

1. American Heart Association. 2005 American Heart Association (AHA) guidelines for cardiopulmonary resuscitation (CPR) and emergency cardiovascular care (ECC) of pediatric and neonatal patients: pediatric advanced life support. Pediatrics. 2006; 117: e1005-28.
2. Atkins DL, Chameides L, Fallat ME, Hazinski MF, Phillips B, Quan L, et al. Resuscitation science of pediatrics. Ann Emerg Med. 2001; 37: S41-8.
3. Blaivas M, Lyon M. The effect of ultrasound guidance on the perceived difficulty of emergency nurseobtained peripheral IV access. J Emerg Med. 2006; 31: 407-10.
4. Leidel BA, Kirchhoff C, Bogner V, Stegmaier J, Mutschler W, Kanz KG. Is the intraosseous access route fast and efficacious compared to conventional central venous catheterization in adult patients under resuscitation in the emergency department? A prospective observational pilot study. Patient safety in surgery. 2009 Oct 8; 3: 1.
5. Sandroni C, Cavallaro F, Antonelli M. Is there still a place for vasopressors in the treatment of cardiac arrest?. Crit Care. 2012; 16: 213.
6. Stouffer JA, Acebo J, Hawks RW. The Portland IO experience. Results of an adult intraosseous infusion protocol. JEMS. 2007; 32: S27-8.
7. Rosetti VA, Thompson BM, Miller J, Mateer JR, Aprahamian C. Intraosseous infusion: an alternative route of pediatric intravascular access. Annals of emergency medicine. 1985; 14: 885-8.
8. Hallas P, Brabrand M, Folkestad L. Complication with intraosseous access: Scandinavian users' experience. West J Emerg Med. 2013; 14: 440-3.