Serum lactate levels and tissue hypoperfusion in complex corrective paediatric cardiac surgeries

Sir, I read with interest the article titled, “Pulse oximeter accuracy and precision at five different sensor locations in infants and children with cyanotic heart disease”, by Das et al. [1] in the November–December issue of the journal. I congratulate the authors on their well-conceived article; however, one point could do with some clarification.

The authors included 50 children posted for various cyanotic congenital heart correction surgeries (including transposition of great arteries, Fallot’s tetralogy, etc.) and the observations were primarily done within 3 hours of the postoperative period in which they compared pulse oximeter measurements with arterial oxygen saturation measurements. Lactate levels above 2 mmol/l were one of their exclusion criteria, and although they have not mentioned the timing of serum lactate measurement anywhere, it can be assumed that those were taken in the immediate postoperative period, i.e. within 3 hours postoperatively. Serum lactate levels were probably taken in order to rule out tissue hypoperfusion which would otherwise interfere with the pulse oximeter findings.

Quite a few number of studies done earlier on serum lactate levels in the initial postoperative period in paediatric cardiac surgery have shown that it takes a considerable time for serum lactate levels to come down any closer to 2 mmol/l. [2,3] With an increase in surgical complexity of the procedure and resultant greater cross-clamp and cardiopulmonary bypass times, the serum lactate levels tend to be very high in the initial postoperative period. [4,5] A remarkable sample size of 50, with lactate levels below 2 mmol/l in each case in the early postoperative period, is rather difficult to achieve.

Abhiruchi Patki
Department of Anaesthesiology, Government Medical College and Superspeciality Hospital, Nagpur, Maharashtra, India

Address for correspondence: Dr. Abhiruchi Patki
Department of Anaesthesiology, Government Medical College and Superspeciality Hospital, Nagpur, Maharashtra, India.
E-mail: abhiruchipatki2204@yahoo.co.in

REFERENCES
1. Das J, Aggarwal A, Aggarwal NK. Pulse oximeter accuracy and precision at five different sensor locations in infants and children with cyanotic heart disease. Indian J Anaesth 2010;54:531-4.
2. Siegel B, Dalton HJ, Hertzog JH, Hopkins RA, Hannan RL, Hauser GJ. Initial postoperative serum lactate levels predict survival in children after open heart surgery. Intensive Care Med 1996;22:1418-23.
3. Kalyanaraman M, De Campli WM, Campbell AI, Bhalala U, Harman TG, Sandiford P, et al. Serial blood lactate levels as a predictor of mortality in children after cardiopulmonary bypass surgery. Paediatr Crit Care Med 2008;9:285-8.
4. Cheifetz I, Kern FH, Schulman SR, Greeley WJ, Ungerleider RM, Meliones J. Serum lactates correlate with mortality after operations for complex congenital heart disease. Ann Thorac Surg 1997;64:735-8.
5. Munoz R, Laussen P, Guillermo P, Zienko L, Piercey G, Wessel DL. Changes in whole blood lactate levels during cardiopulmonary bypass for surgery for congenital cardiac disease: An early indicator of morbidity and mortality. J Thorac Cardiovasc Surg 2000;119:155-62.

Cardio pulmonary cerebral resuscitation 2010 guidelines

Sir,

I read with keen interest the editorial column on ‘Cardio Pulmonary Resuscitation (CPCR) 2010: Improve the quality of care’. [1] The science of resuscitation is evolving rapidly. The 2010 CPCR Guidelines have been laid down. The recommendations of the 2010 International Consensus Conference confirm the safety and effectiveness of current approaches, acknowledge other approaches as ineffective, and introduce new treatments resulting from evidence-based evaluation. In the busy schedule of professional and personal life, doctors have to strain to keep themselves updated. Clinicians are requested to read the complete guidelines published in ‘Nov 2nd, 2010’, issue of AHA.
Hereby I have tried to summarize for brief reference the major changes/developments in 2010 from 2005 CPR guidelines.[2-4]

- Recommendation of C–A–B (Compression–Airway–Breathing) sequence for adult BLS instead of A–B–C (Airway–Breathing–Compression) is the most significant change in 2010 guidelines.

- Lay rescuer should begin cardio pulmonary resuscitation (CPR), if adult victim is unresponsive (single question ‘are you choking’) and breathing is ‘not normal’ (do not waste time in ‘look, listen and feel’), without assessing the pulse; with chest compressions rather than opening airway and delivering rescue breaths.

- EMS dispatchers should provide telephonic instructions in chest compressions—only CPR for untrained rescuer.

- A trained rescuer should provide CPR with compression–ventilation ratio of 30:2. With advanced airway devices, compression at rate 100/min and ventilation at independent rate 8-10/min without interrupting compressions.

2010 Guidelines sustain its earlier stress on delivering high-quality chest compressions. Push hard to a depth of at least 2 inches (5 cm), at rate 100/min, with full chest recoil and minimal interruptions (e.g. hands off time).

- Recommendations unchanged from 2005:
  - Compression:Ventilation ratio (30:2) [single rescuer]
  - Optimal frequency (compression 100/min, ventilation 10-12/min), with advanced airway devices and ≥2 rescuer
  - Tidal volume for artificial ventilation (500-600 mL)
  - Use of capnography to confirm and monitor tracheal tube placement and quality of CPR

Defibrillation of shockable rhythm as soon as possible. Resumption of CPR with chest compression immediately after shock to minimise ‘no flow’ time.

- The CPR techniques and devices reviewed during the 2010 International Consensus Conference: Interposed abdominal compression CPR, active compression–decompression CPR, open-chest CPR, load-distributing band CPR, mechanical piston (thumper) CPR, Lund University Cardiac Arrest System (LUCAS) CPR and the impedance threshold device. There are insufficient data to support or refute their routine use. Load-distributing band or LUCAS CPR may be used to maintain continuous chest compressions while the patient undergoes percutaneous coronary intervention or computed tomography or similar diagnostic studies when provision of manual CPR would be difficult.

- Neonatal: The following are the major new recommendations:
  - The initial evaluation is now directed by the simultaneous assessment of 2 vital characteristics: Heart rate and respiration. The third assessment—of colour is now replaced by oximetry assessment of oxyhaemoglobin saturation.
  - For babies born at term, it is best to begin resuscitation with air rather than 100% oxygen.
  - Administration of supplementary oxygen should be regulated by blending oxygen and air (mixture ratio guided by oximetry).
  - The compression–ventilation ratio should remain at 3:1 for neonates unless arrest is known to be of cardiac aetiology, in which case a higher ratio should be considered.
  - Infants born at term or near term with evolving moderate to severe hypoxic–ischaemic encephalopathy should be offered therapeutic hypothermia at multi-disciplinary unit.
  - It is appropriate to consider discontinuance of resuscitation if there has been no detectable heart rate for 10 min (subjected to case-specific variation).
  - Basic and advanced life support knowledge and skills can deteriorate in as little as 3–6 months. Quality of education, frequent assessments and, when needed, refresher training are recommended to maintain resuscitation knowledge and skills.

**Roona Shad, GS Agnihotri**
Department of Anaesthesiology, Gandhi Medical College and Associated Hospitals, Bhopal, Madhya Pradesh, India

**Address for correspondence:**
Dr. Roona Shad, PT-1, Fortune Enclave, Kolar Road, Bhopal, Madhya Pradesh - 462 042, India. E-mail: roonashad@yahoo.ca

**REFERENCES**

1. Harsoor SS. Cardio Pulmonary Resuscitation 2010-Improve the quality of care. Indian J Anaesth 2010;54:91-4.
2. Hazinski MF, Nolan JP, Billi JE, Böttiger BW, Bossaert L, de Caen AR, et al. Part 1: Executive summary: 2010 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. Circulation 2010;122 (suppl 2):S250-75.

3. Sayre MR, O’Connor RE, Atkins DL, Billi JE, Callaway CW, Shuster M, et al. Part 2: Evidence Evaluation and Management of Potential or Perceived Conflicts of Interest: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation 2010;122(18_suppl_3):S657-64.

4. Morley PT, Atkins DL, Billi JE, Bossaert L, Callaway CW, de Caen AR, et al. Part 3: Evidence evaluation process: 2010 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. Circulation. 2010;122(suppl 2):S325-37.

Ranitidine anaphylaxis: A rare occurrence

Sir,

Anaphylactic reaction to antacid–ranitidine hydrochloride is very rare but can be life threatening. We are reporting a very rare adverse effect of intra-venous ranitidine hydrochloride. Ranitidine hydrochloride, a histamine-2 receptor (H2R) antagonist is the widely used antacid. It produces selective and reversible inhibition of H2R-mediated gastric secretions. This medication is often used intravenously in operating rooms, recovery rooms, and wards. Ranitidine has excellent safety records,[1] although the incidence of anaphylactic reaction to H2R antagonists and proton pump inhibitors together has been reported as 0.3%–0.7%.[2]

A 65-year-old male patient 165 cm, 74 kg, with stricture urethra was scheduled for urethroplasty. He was a known case of hypertension on tab losartan potassium–hydrochlorothiazide and amlodipine once daily since 5 years. He had a history of ischaemic heart disease and chronic obstructive pulmonary disease, was on tab glyceryltrinitrate and clopitab once daily since 2 years, he was also on tab deriphyline twice daily. Recently he was diagnosed diabetic for which he was on tab metformin once daily. He had undergone cholecystectomy under general anaesthesia uneventfully, 15 years back.

Preoperative investigations and examinations were within normal limit. Combined spinal epidural anaesthesia was used for urethroplasty. Intraoperative course was uneventful. Postoperatively, after 90 min, in the recovery room, the patient became drowsy, unresponsive with pulse rate of 38/min, blood pressure 80/60 mmHg, and SpO_2_ 86%. On ascultation bilateral ronchi were present. Immediately cardiopulmonary resuscitation was started. Inj. atropine 0.6 mg, inj. adrenaline 1 mg was given intravenously. The patient was intubated and ventilated with 100% oxygen. Inj. hydrocortisone 100 mg, inj dexamethasone 8 mg were given intravenously. The patient was put on dopamine infusion. Blood was sent for investigations. Electrocardiogram and chest radiograph were normal, ABG showed pH-7.21, PCO_2_ -36 mm PO_2_ -431 mm, HCO_3_- 16.5 mEq/L and saturation 100%. Electrolytes were Na 140 mEq/L, K 3.5 mEq/L, and Cl 104 mEq/L. Metabolic acidosis was corrected. The patient was stabilized and shifted to intensive care unit and kept on ventilator, extubated within 24 hours and shifted to ward.

Upon inquiry with the patient’s relative about allergic history or such similar episode in the past, they revealed that similar episode was observed 15 years back after open cholecystectomy surgery. The patient’s relative then offered his old reports. Those revealed reaction to ranitidine. We arrived to diagnosis of anaphylaxis to ranitidine as that was the only injection given in the recovery room by staff nurse. The patient was sent for skin test and intra-dermal test which came positive for ranitidine that confirmed the diagnosis. He was issued red card stating allergic to ranitidine and his relatives were alerted before discharge.

Ranitidine, an H2R antagonist is commonly used to treat peptic ulcer and gastro-oesophageal reflux disease. Although it is associated with low incidence of adverse reactions, severe anaphylaxis and anaphylactoid reaction to ranitidine has been reported in obstetric[3] and with pancreatitis[4] patients.

In the recovery room, this patient developed sudden hypotension, bradycardia, hypoxia, dyspnoea and loss of consciousness with cardiopulmonary collapse. Immediately resuscitation was done. Haemorrhage, delayed high spinal, hypoglycemia, electrolyte imbalance, hypersensitivity to peri-operative drugs, Access this article online

Quick Response Code:

Website: www.ijaweb.org

DOI: 10.4103/0019-5049.84825