A Paediatric Case of Severe Hypertention and Pulmonary Oedema following application of Topical Phenylephrine Eye Drops During Surgery.

A Anwar, K Dalgleish
Royal Manchester Children's Hospital, Manchester University NHS Foundation Trust, Manchester

NHS
Manchester University
NHS Foundation Trust

Case History:

- 12 year old 50kg female.
- Emergency left retinal detachment surgery.
- PMHx: an ex-prem (30/40) spending 6/52 in SCBU but no long-term sequelae of prematurity. Blind in her right eye due to previous retinal detachment.
- No allergies. No regular medications.

The Anaesthetic:

- Induced IV with Remifentanil TCI, Propofol 110mg and Rocuronium 30mg.
- Airway Grade 1 at laryngoscopy and secured with a 7.0mm RAE ETT.
- Maintenance: Sevoflurane (2-2.6%) in a mixture of Air/Oxygen. Remifentanil TCI. Other Drugs: Ondansetron 4mg, Dexamethasone 6.6mg, Paracetamol 1g.

Critical Incident:

- At the beginning of the surgery the patient became bradycardic due to the oculocardiac reflex. Surgery was stopped and atropine (300micrograms) given to good effect before surgery resumed.
- The surgeon then administered topical drops of 10% aqueous phenylephrine to the left eye, for further pupil dilation.
- Within minutes, the NIBP increased to 180/100 mmHg, HR of 140-beats/min. Remifentanil was increased in response.
- With a Fi02 of 0.4, Oxygen sats dropped from 98% to 80%. The FiO2 was increased to 1.0 and the patient was hand-ventilated but the Sp02 did not increase above 90%.

On Auscultation there was widespread crepitations. A suction catheter was passed down the ETT and pink-frothy fluid was aspirated suggesting acute pulmonary oedema. IV Furosemide 20mg and Hydrocortisone 50mg were administered and within thirty minutes the blood pressure and heart rate had normalized, with the Sp02 improving to 94% on FiO2 of 1.0. An X-ray confirmed pulmonary oedema and on consultation with a respiratory physician, further doses of Furosemide, Hydrocortisone and Cefuroxime (1.5g) were given. A urinary catheter and arterial line were sited. After two hours the patient became more stable and due to the sight-saving nature of the procedure the operation was allowed to continue. By this time, the FiO2 had decreased to 0.4 with SpO2 of 97%. Surgery was uncomplicated and the patient was extubated and remained in recovery for an extended period of observation. A postoperative 12-lead ECG and echocardiogram were normal.

Discussion

Anaesthetists should be conscious of the potential cardiovascular side effects of topical phenylephrine, a sympathomimetic direct alpha-agonist. Most systemic effects of topical medications are dose-related and should be used cautiously with appropriate haemodynamic monitoring.

Preventive strategies to minimise systemic absorption of the drugs should be taken including using a lower concentration (2.5% vs 10%), avoiding repeated dosing, removing excess drops and pressure on the nasolacrimal passage after administration.