Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Hypoxaemia associated with one-lung anaesthesia: an alternative approach

Editor—Ng and Swanevelder examine the serious problem of hypoxaemia during one-lung anaesthesia and the factors which may exacerbate the hypoxaemia.[1] They consider the ways it may be attenuated. However, they omit to consider boosting the oxygen content in the shunt. This can be achieved by a small amount of oxygen into the non-ventilated lung. This technique was described in 2009 and is referred to as IPAP (intermittent positive airway pressure).[2] Small slow puffs of oxygen into the non-ventilated lung usually will quickly restore the arterial oxygen saturation above 95%.

Conflict of interest

None declared.

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2 Russell WJ. Intermittent positive airway pressure to manage hypoxia during one-lung anaesthesia. *Anaesth Intensive Care* 2009; **37**: 432–4

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Reply from the authors

Editor—We thank Dr Russell for his interest in our editorial.[1] He cites an observational study of 10 patients, conducted in his department.[2] Hypoxaemia during one-lung ventilation was attenuated by slow inflation of 2 litre min^{-1} of oxygen into the non-ventilated lung for 2 s, every 10 s, for a duration of 5 min or until oxygen saturation increased to 98%.[2]

Unfortunately, we did not cite Dr Russell's interesting study, owing to the restrictions of the peer-review process and the maximum number of references for editorials.

In addition, the aforementioned study was perhaps an exploratory one as there were no data on the percentage of intrapulmonary shunt and no comparison with a similar technique involving administration of oxygen under continuous positive airway pressure, to the non-ventilated lung.[3] Hypoxaemia associated with one-lung ventilation is an important consideration for thoracic anaesthetists and we await further studies to confirm the utility of intermittent positive airway pressure.

Conflict of interest

None declared.

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Nebulized activated protein C in a paediatric patient with severe acute respiratory distress syndrome secondary to H1N1 influenza

Editor—Severe acute respiratory distress syndrome (ARDS) secondary to H1N1 influenza has a high mortality in children with underlying chronic medical condition, and apart from antiviral agents, no therapy has demonstrated a significant improvement in outcome to date.[1 2] Supportive treatment is based on protective mechanical ventilation techniques and extracorporeal membrane oxygenation (ECMO). At present, the pharmacological treatment of ARDS is directed at inhibition of the inflammatory and fibrotic pathways, and is the basis for the use of steroids, although no clear benefits on mortality have been found.[3] Activated protein C (aPC) has anticoagulant, anti-inflammatory, and antiapoptotic effects, and its i.v. administration is included in septic shock guidelines for adult,[4] but not paediatric patients.[5] Nebulized aPC has showed a beneficial effect in different animal models of lung injury.[6] Activation of the coagulation pathways can amplify the inflammatory response, and the use of anticoagulants to prevent lung injury or remodelling in ARDS was proposed a decade ago. However, despite the potential benefits of aPC in acute lung injury and the fact that early administration of aPC has been advocated as a potential therapy in ARDS,[6] no studies have specifically addressed this issue in humans.

We report a case of paediatric aPC nebulization in a 10-yr-old child with a history of chemotherapy for orbital rhabdomyosarcoma and progressively severe H1N1-related ARDS after pneumonia which did not respond to antibiotics, oseltamivir, steroids, and various modes of ventilatory support [non-invasive, conventional, and high-frequency oscillatory ventilation (HFOV)]. The patient was admitted to the paediatric intensive care unit with respiratory failure and shock. A rapid deterioration in compliance and blood gases was observed after admission, and after 5 days of mechanical ventilation, the patient presented bilateral chest infiltrates, a $Pa_{O_2}/F_{I_{O_2}}$ ratio of 10.8 kPa, and an oxygenation index of 28 requiring a potentially deleterious high mean airway pressure (25–30 mm Hg) on HFOV to achieve

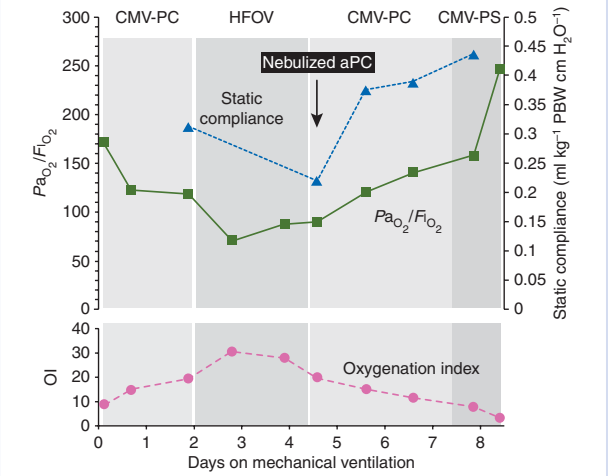

Fig 1 Time course of ventilatory variables. CMV-PC, controlled mechanical ventilation-pressure controlled; HFOV, high-frequency oscillatory ventilation; CMV-PS, controlled mechanical ventilation-pressure support; aPC, activated protein C; OI, oxygenation index; PBW, predicted body weight.

a peripheral oxygen saturation of 86%. The lung injury score was 3.75 (being 4 the maximal severity score), and ECMO was not used due to a low platelet count (35 000 mm^{-3}). The probability of death was estimated to be 70%.[7] On the basis of a positive experience in an adult late ARDS,[8] and after obtaining informed consent from the relatives, nebulized aPC 1 mg was given over 30 min every 2 h. The use of nebulized aPC in the most severe cases of ARDS (*in extremis*) is approved by our institution. A progressive improvement in the ventilatory variables was observed (Fig. 1), and the trachea was extubated on day 5 after starting aPC nebulization, and the patient transferred to the ward 1 week later. The drug was administered for 4.5 days (total amount of 54 mg in 54 doses), with no evidence of haemorrhagic complications despite the low platelet count. Any beneficial effect of aPC may have been due to local or systemic actions. We consider that systemic effects are unlikely in this case, as no benefits were observed after i.v. aPC in a previous acute lung injury study,[9] and a lower dose of aPC than the recommended one by i.v. route was used. On the basis of this case and a previous experience,[8] we hypothesize that nebulized aPC may be a useful therapy in severe ARDS, although formal clinical studies are required to establish this.

Conflict of interest

Dr Pestaña has received lecture fees from Eli Lilly. Dr de la Oliva declares no conflict of interest.

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Iliopsoas haematoma: unexpected life-threatening complication during extracorporeal membrane oxygenation support in H1N1-induced acute respiratory distress syndrome patients

Editor—The use of extracorporeal membrane oxygenation (ECMO), as recently suggested by the results of CESAR trial,[1] can improve the outcome in patients with acute respiratory distress syndrome (ARDS). ECMO has been adopted in H1N1-induced ARDS since last year.[2] Although ECMO is a safe and feasible device if used in specialized centres,[2] ECMO-related complications can occur in circuit insertion/management (cannulae, pump, filter) and due to heparin infusion (haemorrhages). We report on two patients admitted to the intensive care unit (ICU) of ECMO referral centre (Careggi Teaching Hospital, Florence, Italy) in January 2011, during the second season of H1N1 pandemic.

The first patient was a 61-yr-old man, BMI (41 kg m^{-2}), admitted to hospital with dyspnoea after 5 days of flu symptoms. On day 3 of mechanical ventilation, the ECMO team was called. Owing to the high BMI, a right femoral–jugular ECMO was started in the peripheral ICU, and the patient was transferred to our ICU. After 10 days of ECMO support, mild physiotherapy and reduction of ECMO support started. On day 15, the patient complained of groin pain in the site of entry of the ECMO cannula. A decrease in haemoglobin