

Critical Care Canada Forum 2009

Tuesday October 27

Monday's Conference Highlights



Dr. Iain J. McCullagh FRCA Conference Reporter

I, for one, am expecting a very high take-up when the H1N1 vaccine is offered today. Having already had the vaccine, my aching shoulder has now recovered enough for me to summarise the best bits of yesterday, so here goes.

The day began with a report from the first ever CCCF consensus conference, the subject being cardiovascular risk reduction in critically ill patients, with a focus on oxygen supply/demand and beta-blockade in particular. As of yet, no firm guidance can be given in our heterogeneous ICU population, except to avoid hypotension, plus a suggestion not to use these drugs until the haemoglobin concentration is acceptable. Here's hoping that this enterprise will be the first of many in the coming years.

Next was a session describing the scale of the problem of post ICU disability and its potential therapy. Dr Herridge began by expertly framing all of the current data in this area. This was followed by a look at the details of muscle function and dysfunction. Data was summarised showing benefit from early physiotherapy during mechanical ventilation, followed by some potential solutions (e.g. muscle stimulation, cycling). I was certainly left wondering what could be achieved with my own patients if I had greater resources to mobilize!

The best attended session of the day was, undoubtedly the first dealing with H1N1. With the media in attendance, the worldwide data so far was presented revealing large similarities with the 1918 outbreak where, thankfully, in Canada, a mortality rate overall of just 17%. The importance of early treatment with antiviral agents stood out, as did an impression that rescue therapies such as ECMO and nitric oxide are driven more by local familiarity and availability than established evidence.

In the afternoon we welcomed the Saudi Critical Care Society in a series of enlightening talks. The development of critical care was plain to see and there is no doubt that facilities in Saudi rival those anywhere in the world.

A description of the monumental efforts put in place to deal with the inevitable casualties occurring during the annual Hajj pilgrimage, revealed an expectation of several admissions per hour during certain periods. Unbelievably, some hospitals were opened and staffed specifically for this short period. This year's pilgrimage will coincide with the expected occurrence of the second peak of H1N1 in Saudi. But from what I have heard there will be few countries better prepared for the expected upsurge in ICU admissions.

**Toronto Public Health will be on site
at the CCCF 10:30 am through
lunch time offering the H1N1 vaccine.
The dosing clinic will be held in the
Trade Fair.**

Invasive Fungal Infections in the ICU Diagnostic and Therapeutic Challenges

Lunch Symposium

Tuesday, October 27, 2009
12:30pm - 1:30pm
The Sheraton Centre Toronto
Sheraton Room C- Lower Concourse

Sponsored by Pfizer

Tuesday Highlights

8:00-9:30 Industry Relationships: Drs Stossel and Detsky give perspective on this "can't live with them but can't live without them" relationship, sure to be a lively debate.

9:30-10:45 ARDS- mechanisms and molecules: Drs Esteban, Kavanagh and Marini take us through some ongoing controversies in the pathogenesis of this condition.

11:15-12:30 Extracorporeal support: Drs Henzler, Lapinsky and Bagshaw will educate us on this topical subject in light of the CESAR trial and talk of increased refractory hypoxemia in our H1N1 patients.

1:30-3:00 Critical Care Societies Around the World: Drs Evans, Arabi, Marshall and Granton give us a British, Saudi and Canadian Perspective on the current state of intensive care worldwide.

3:30-5:00 H1N1 rescue and Triage: Drs Dominguez, Cooper, Christian and Frolic look into the differences between ARDS caused by H1N1 and our usual patient population, including use of ECMO in Australia. Followed by discussion of a proposed strategy of triage, in the event of an overwhelming number of cases.

5:00-5:15 High Volume Hemofiltration- the RENAL RCT results: A formal presentation of the recently published trial comparing high (40ml/kg) to lower (25ml/kg) intensity continuous hemofiltration in critically ill adults.



Q & A with Dr. Robert A. Fowler, Sunnybrook Health Sciences Centre, Toronto

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Q: What does pandemic H1N1 associated critical illness look like?

A: The typical presentation is a rapidly **progressive diffuse pneumonitis associated with severe, refractory hypoxia, in relatively healthy teens or adults**. Patients with chronic underlying disease may have acute decompensations of these illnesses; so respiratory symptoms and an exacerbation of a preexisting illness should raise the suspicion of illness. Acute and prolonged exacerbation of chronic obstructive pulmonary disease and asthma may occur. Bacterial pneumonia may complicate H1N1. Bronchiolitis and croup in young children may require hospitalization, but rarely ICU care. The average duration of mechanical ventilation is **12 days** and the 90-day mortality for critically ill H1N1 patients is about **17%**. The most common causes of death are severe ARDS, secondary infection, sepsis or multi-organ dysfunction syndrome

Q: How should Intensivists for critically ill H1N1 patients?

A: Critically ill patients with H1N1 have acute lung injury and treatment primarily consists of **infection control, optimal care for acute lung injury, and antiviral medication**.

- Neuraminidase inhibitors should be started at clinical suspicion of Influenza, prior to confirmatory testing in critically ill patients: oral **oseltamivir** 75-150 mg twice daily for 5-10 days.
- Patients with influenza are at risk for **secondary bacterial pneumonia**, commonly with Gram-positive pathogens including *S. pneumoniae*, *S. aureus* and Group A Streptococci, within 1-3 weeks of influenza onset.
- **Non-invasive ventilation** does not appear to prevent intubation and should be avoided.
- **Lung-protective ventilation:** tidal volumes <6 ml/kg predicted body weight targeted to a plateau pressure ≤ 30 cm H₂O.
- Apply **PEEP** according to degree of hypoxia and response (most patients receive 10-15 cm H₂O over first week in ICU)
- Avoid intravascular volume overload and consider **diuretic therapy** to maintain neutral to negative fluid balance in hemodynamically stable patients
- **Sedation** to support comfort and ventilator-patient interactions but avoid over-sedation by using daily interruption of sedation
- Use **neuromuscular blockade** only when necessary for refractory hypoxia.
- There is no data to strongly support corticosteroid use for H1N1-related illness.
- Remain vigilant for and treat **ventilator-associated pneumonia**, which can affect H1N1 patients like other mechanically ventilated patients with lung injury.

Q: Severe hypoxia occurs in most critically ill H1N1 patients - how should this be treated?

A: The **harm of prolonged severe hypoxia** in otherwise healthy patients is unknown and may not be as dangerous as some treatments offered to address it; or the risk of transfer. Patients with ALI usually tolerate oxygen saturations of 85-88%.

- Observe for **reversible causes of hypoxia** including endotracheal tube malpositioning, pneumothoraces, bacterial pneumonia, fluid overload, and atelectasis.
- Consider changing **patient position** (lateral decubitus) which can improve oxygenation. For centres with prior experience, consider a trial of **prone ventilation**, ensuring a well-thought out plan for securing lines and tubes, sufficient personnel to help with turning, airway expert at the head, proper pressure sore avoidance strategies, and patient eye protection.
- **Recruitment maneuvers** (high levels of CPAP or PEEP for relatively brief periods) followed by an increased level of PEEP can be tried.
- Alternate but unproven modalities include **High Frequency Oscillatory Ventilation, inhaled nitric oxide or prostacyclin, and Extra-corporeal Life-Support**.
- For patients with continued oxygenation difficulties, on high FiO₂ (>70%), consider **consulting a colleague** (Ontario Critical "On-Call" physician for H1N1 support).

Q: How do we protect my staff and other patients from infection?

A: Patients with suspected influenza should be managed **using droplet and contact precautions** by healthcare professionals who wear their fit tested N95 respirator, in addition to gloves, gown and eye-protection for close contact and procedures.

Although high frequency oscillatory ventilation may generate aerosol, this concern may be mitigated by rapid piston shut-down when there is a disconnection and loss of pressure in the circuit. Most HFOV circuits can also be equipped with bacterial-viral filters and an exhalation port scavenger system to further mitigate risk.

Q: How do we handle a surge of pandemic H1N1 cases?

A: All Ontario hospitals have developed **surge plans**. ICU surge leads, critical care LHIN leads and the critical care secretariate are monitoring daily ICU and H1N1 activity in all ICUs. Additional support through patient transfer, curtailing of other activities leading to demand, and increased ventilator or personnel support are options.



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