Meeting report

Toronto Critical Care Medicine Symposium, 18–20 October 2001, Canada: Research breakthroughs are not enough

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Abstract

At the 2001 Toronto Critical Care Medicine Symposium, exciting new research results were presented, including a randomized trial of peri-operative pulmonary-artery catheter use and evidence-based guidelines for the prevention of ventilator-acquired pneumonia. Presenters reviewed other important recent critical care developments such as (1) activated protein C and low-dose steroids in sepsis, (2) prone positioning and long-term outcomes in patients with adult respiratory distress syndrome, and (3) medical errors in the critical care unit. Along with these new findings, another theme emerged during the symposium. This theme emphasized that research breakthroughs are not sufficient in themselves: outcome studies are needed to learn how new research is applied on a large-scale basis within actual clinical practice. Furthermore, additional study is needed for an understanding of how physicians implement new research findings. Successful methods of enhancing the widespread adoption of new research require further study.

Keywords adult respiratory distress syndrome, critical care, pneumonia, sepsis, Swan–Ganz catheterization

The Toronto Critical Care Medicine Symposium took place on 18–20 October 2001. Despite worldwide concerns with air travel, international faculty and participants turned out in large numbers. There were many exciting mini-symposia on topics ranging from nutritional support, sedation, and neuro-critical care to medical errors and end-of-life care. Focused learning sessions on controversial critical care topics provided practical guidance to clinicians. There were also workshops on hand-held technology and patient simulators. This meeting report presents highlights from the symposium.

Sepsis

In his provocative presentation, Dr Gordon Rubenfeld asked whether sepsis was a disease. When there is no gold standard for diagnosis, he suggested that lessons could be learned from rheumatology and psychiatry in creating reliable and valid diagnostic criteria for sepsis. Dr John Marshall expanded on this theme in his novel presentation on the interface between oncology and sepsis. He emphasized the need for clearly defining homogenous patient populations for testing sepsis therapies. He proposed an IRO (Insult, Response, Organ dysfunction) staging system that might be helpful in this regard, just as TNM (Tumor, Nodes, Metastasis) staging is in oncology trials. Dr James Russell addressed issues arising from the PROWESS trial [1] of activated protein C (APC). He explained how sepsis results in inflammation and abnormalities of coagulation, anti-coagulation and fibrinolysis. Further research into the genetic profile that decreases APC activity might highlight those patients who could potentially benefit most from this novel therapy. Similarly, Dr Phillip Dellinger emphasized that although anti-tumor-necrosis-factor therapy has not shown a statistically significant benefit in trials and meta-analysis, the signal of benefit might be increased by careful patient selection. Finally, in looking at old therapies currently being revisited, Dr Mitch Levy reviewed some new data from Dr Djillali Annane's latest study of low-dose steroids in sepsis (unpublished data) that demonstrate a statistically significant reduction in 28-day all-cause mortality.

APC = activated protein C; ARDS = adult respiratory distress syndrome; PAC = pulmonary artery catheter; VAP = ventilator-associated pneumonia.

Adult respiratory distress syndrome (ARDS)

Dr Luciano Gattinoni presented results from his recent publication [2] on prone positioning in the ventilation of ARDS patients. Possibly owing to under-powering of the trial, prone positioning did not show an overall mortality benefit despite improving patient oxygenation. However, post-hoc analysis demonstrated a significant benefit in the quartile of patients with the most severe oxygenation difficulties. The trial also demonstrated a very low rate of complications from prone positioning. Thus, further investigation may be warranted among patients with the most severe ARDS.

Dr Margaret Herridge presented the latest results from her long-term follow-up of ARDS survivors. During 2 years of follow-up, patients continue to show improvement toward their baseline pre-ARDS health status. Patients have significant generalized muscle weakness and fatigue that limits their activities of daily living and 6-minute walk distance. Despite this, 42% and 64% of patients have returned to their original work by 1 and 2 years, respectively. Interesting results will continue to be generated during the continuing 5-year follow-up of this cohort.

Pulmonary artery catheters in high-risk peri-operative patients

Dr Dean Sandham presented results of his recent multi-centre trial (unpublished data) of peri-operative use of pulmonary artery catheters (PACs). In his trial, 1994 patients more than 60 years old requiring surgery were randomized to the use or non-use of PACs in optimizing their peri-operative hemodynamic status. Patient mortality at 28 days and 1 year were not significantly different between groups. He cautioned that there was a significantly higher rate of pulmonary embolus and catheter-related complications in the PAC group that, over a large group of patients, would cause significant morbidity.

Strategies to reduce ventilator-associated pneumonia (VAP)

On behalf of the Canadian Critical Care Task Force, Dr Peter Dodek presented new clinical practice guidelines for VAP (unpublished data). These guidelines were developed under a rigorous methodology not used in previous VAP guideline development. Recommendations include the use of orotracheal (rather than nasotracheal) intubation, non-invasive positive-pressure ventilation (where possible), and 45° patient positioning. Ventilator circuits and closed endotracheal tube suctioning should be changed only with a new patient or soiling. Finally, sucralfate and topical gastrointestinal decontamination are not recommended in preventing VAP.

Integration of new research into practice

Dr William Sibbald gave an interesting plenary address on adopting new research into clinical practice. Using sepsis research as an example, he commented that the most rigorous methods must be used in bench research before starting clinical trials, to maximize success at the bedside. However, despite good trials, clinicians might fail to practise the most effective form of care. ARDSnet investigator Dr Taylor Thompson illustrated this in another presentation, by commenting that even ARDS trial centres might not be using 6 cc/kg ideal body weight in ventilating patients. Dr Sibbald postulated that more aggressive marketing of research successes jointly with industry, within lay media, and with government might improve clinical application. In describing new ARDS trials under way, Dr Maureen Meade agreed with Dr Thompson that ground-breaking qualitative research into barriers to the implementation of new research is also necessary.

Reducing medical errors in the intensive care unit

As one of the most provocative sessions of the symposium, Dr Beverley Orser introduced the scope of medical errors by describing the high human and medical cost of errors. Dr Ed Etchells discussed the problem of disclosure of medical error. Dr Kim Vincent described a comparative evaluation of two human–computer interfaces for a commercially available patient-controlled analgesia machine. This comparison demonstrated how insufficient attention to appropriate design of the human–computer interface contributes to medication errors. Finally, Mr Ron Kaczorowski highlighted how the critical care environment is conducive to medical errors because of the multitude of processes required in the acquisition of patient data, and the lack of technological integration of data transfer and communication to physicians and staff.

Conclusion: a research agenda

One theme permeated the symposium presentations: research breakthroughs are not in themselves sufficient to improve patient care. Large-scale studies of patient outcomes in the real world are necessary to address how successfully research is being integrated into clinical practice. Novel qualitative research into changes in physician behavior is required to integrate new research successfully into critical care practice so as to maximize patient survival and quality of life. This is our challenge as intensivists charged with the care of critically ill patients. We look forward to progress with these challenges at next year's Symposium, on 31 October to 2 November 2002.

Competing interests

None declared.

References

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