AAP Journals BLOG

A Crystal Ball for Pediatric Septic Shock

July 18, 2017

I chose to talk about this article, even though it appeals primarily to a highly specialized group of clinicians and has no immediate clinical application, because it is instructive on how careful consideration of clinical outcomes can help guide future randomized controlled trials.

Dr. Bud Wiederman, MD, MA, Evidence eMended Editor, Grand Rounds

Article type: AAP Grand Rounds Blog

Well, not quite a crystal ball. However, if clinicians could reliably identify children at high risk of mortality at the time of admission to an ICU, newer management modalities could be targeted specifically for his group of children.

Source: Schlapbach LJ, MacLaren G, Festa M, et al. Prediction of pediatric sepsis mortality within 1 h of intensive care admission. **Intensive Care Med. 2017; 43:1085-1096**. doi: 10.1007/s00134-017-4701-8. See **AAP Grand Rounds commentary by Dr. Susan Bratton** (subscription required).

I chose to talk about this article, even though it appeals primarily to a highly specialized group of clinicians and has no immediate clinical application, because it is instructive on how careful consideration of clinical outcomes can help guide future randomized controlled trials.

The study was carried via a retrospective review of pediatric septic shock patient data stored in the **Australian and New Zealand Paediatric Intensive Care (ANZPIC) Registry**, an administrative database. As the authors point out in their introduction, pediatric sepsis research is plagued by a lack of a validated gold standard definition of this diagnosis, and trying to perform clinical trials starting with that disadvantage creates all kinds of problems. A reliable, generalizable prediction rule to highlight the children at highest risk for mortality, especially if available soon after ICU admission, would allow newer tests and treatments to be applied to this population.

The authors employed a number of standard statistical approaches to come up with a mortality prediction sepsis score with 7 variables, all available within 1 hour of ICU admission, that was pretty good at predicting 30-day mortality. However, we should all be reminded of the limitations of administrative databases, where the finer details of clinical documentation are missing and patients might be misclassified, especially with no overarching gold standard definition of pediatric septic shock.

It's clear that further advances in treating septic shock will require treatment modalities beyond just choosing the correct antibiotic, and randomized controlled trials to date have unsurprisingly given us conflicting and overall disappointing outcomes. Part of the problem may be that we're dealing with **spectrum bias**, trying to interpret benefits of tests (and treatments) on an entity we call pediatric septic shock but in fact might consist of multiple different pathophysiologic patterns that require different approaches. This ANZPIC prediction rule requires validation in prospective studies across a broader span of locations and practice settings, but ultimately I think will bring us closer to better-designed management interventions.

- Facebook