Optimal Management of Bronchiolitis: Why Don't We Have a Definitive Answer?

by Dr Bud Wiedermann MD, MA, Evidence eMended Editor, Grand Rounds

You may not realize it, but we have an interesting race in progress. Will researchers find the truly best method for managing bronchiolitis before other investigators develop an effective respiratory syncytial virus (RSV) vaccine? I'm rooting for both groups.


The RSV vaccine development process is slower than most, in part because a long-ago RSV vaccine under investigation turned out to have a higher mortality rate from severe RSV than did a placebo group. I have hope that a safe and effective vaccine eventually will come to fruition, and, when it does, large-scale trials of bronchiolitis management strategies will be nearly impossible, due to the scarcity of patients (which is a good thing!).

In the meantime, studies like this one from a single tertiary children's hospital in Australia try to give us some insight into management strategies. I truly enjoyed reading the Methods section* of the study, because it was thorough, concise, and followed the best methodology for conducting and analyzing a randomized controlled trial. In particular, the randomization strategy was excellent, randomizing in blocks (important for a seasonal disease) and stratifying for degrees of prematurity (a major severity risk factor). Also, they explained very clearly why blinding/masking was not possible with this intervention. Their statistical plan was very clear and thoughtful.

As the title states, the researchers compared 2 different respiratory management strategies, high-flow warm humidified oxygen (HFWHO) and standard therapy (ST) consisting of low-flow cold humidified oxygen delivered via a standard infant nasal cannula. Children less than 24 months of age were randomized to receive 1 of these therapies, with enrollment occurring over 5 bronchiolitis seasons. The 202 enrolled infants were equally divided between the 2 groups, and the investigators found no difference between HFWHO and ST for time to weaning off oxygen (20 versus 24 hours), but did see some difference in event-free survival at 24 hours (90% for HFWHO versus 60% for ST). (An example of an "event" was requiring transfer to intensive care.) The authors concluded from the finding of no difference in oxygen weaning time that the mode of oxygen delivery didn't significantly alter the underlying disease process, but that HFWHO use might have prevented intensive care admission in some children. However, I liked the fact that they were cautious not to oversell this finding in the abstract or in their discussion.
This was a single-center study, and often we worry that studies of this type won't be generalizable to other institutions. That certainly is a concern here, in particular because the management guidelines for bronchiolitis in Australia differ significantly from AAP guidelines. Specifically, many of the infants included in the Australian study may not have met AAP criteria for oxygen supplementation at all. On the other hand, bronchiolitis trials are notoriously difficult to manage in a multi-center format, because the severity scoring criteria are necessarily a bit subjective, and it's difficult to maintain uniformity of scoring and clinical practice among multiple centers over a prolonged study period.

Next week, we'll discuss a multicenter bronchiolitis trial.

*Does anyone, even a confessed evidence-based medicine nerd like I, truly enjoy reading a Methods section? Probably the best I could say is that scouring the Methods section of an original study is a very necessary evil if one is trying to decide on making changes to medical practice.