Journal Club Eastern Virginia Medical School
Therapy Article

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Date: 10/26/15

CITATION: Cunningham S, Rodriguez A, Adams T, et al. Oxygen saturation targets in infants with bronchiolitis (BIDS): a double-blind, randomized, equivalence trial. *Lancet.* 2015;386:1041-48.

I. **WHAT IS BEING STUDIED?**	
1. Study Objective	To provide evidence to support AAP and WHO recommendations for permissive hypoxemia in children with LRTI. To assess whether a target oxygen saturation of 90% or higher would be equivalent to 94% or higher for resolution of illness in acute viral bronchiolitis.
2. Study Design	Parallel-group, randomized, controlled, equivalence trial at 8 pediatric UK hospitals over two 6 month winter bronchiolitis seasons
3. Inclusion Criteria	Infants aged 6 weeks – 12 months of age with physician-diagnosed bronchiolitis and who required admission
4. Exclusion Criteria	Preterm infants (<37 wGA), those who had received oxygen in the past 4 weeks; had cyanotic or hemodynamically significant CHD, cystic fibrosis, interstitial lung disease, immune function deficit, were directly admitted to high-dependency or ICU, or were previously randomized
5. Interventions Compared	Infants given oxygen at <94% saturation and <90% saturation, using standard and modified pulse saturation oximeters
6. Outcomes Evaluated	Time to resolution of cough, time to feed adequately, time to parental perception of back to normal
II**. Are the results of the study valid**	
1. Was the assignment of patients randomized?	Yes, 1:1 randomization of varying lengths (four to six)
2. Was randomization concealed (blinded)?	Yes, randomization was by a central internet-based secure password-protected computer and generated by a computer program at the Edinburgh Clinical Trials Unit, UK.
3. Were patients analyzed in the groups to which they were randomized?	Yes. Primary analysis was done by intention-to-treat. A per protocol analysis was also performed and conclusions were drawn based upon agreement of both analyses.
4. Were patients in the treatment and control groups similar with respect to known prognostic factors?	Yes. Patient characteristics Table 1 are similar.
III. **Did experimental and control groups retain a similar prognosis after the study started (answer**	

the questions posed below)?	
1. Were patients aware of group allocation?	No. Patients and parents were masked to intervention
2. Were clinicians aware of group allocation?	No. Clinicians were aware of the study so it is conceivable that a comparison between study and non-study oximeters could be used to identify modified oximeters
3. Were outcome assessors aware of group allocation?	No. As above
4. Was follow-up complete?	Yes; Reminder cards were given to families and they were called after discharge; 12 (of 308) lost in standard group and 14 (of 307) lost in modified group
IV. What were the results? Answer the questions posed below	
1. How large was the treatment effect? (Difference between treatment and control group).	Primary Outcome: No difference in time to resolution of cough; 15.0 days both groups (95%CI -1.0-2.0) Same for ITT and per protocol assessments. Secondary Outcomes (time to feed, parental perception of "back to normal" Trend towards infants returned to adequate feeding 2.7 h sooner (median) in the modified group, with the 95% CI (–0.3 to 7) falling outside the statistical significance Similarly, infants in the modified group were considered back to normal 1 day sooner by parents (table 2) with the 95% CI of 0 to 3 also falling outside statistical significance Post-hoc assessment A ***post-hoc*** analysis for the difference between time-to-event outcomes namely, time to return to adequate feeding gave a HR of 1.22 (95% CI 1.04–1.44, p=0.015), and for time 'back to normal' a HR of 1.19 (95% CI 1.00–1.41, p=0.043). Other statistically significant outcomes: modified group fit for discharge sooner (30.2 vs. 44.2h), (95%CI 1.23-1.73) discharged sooner (40.9 vs. 50.9h) (95%CI 1.09-1.50), and stopped oxygen therapy sooner (5.7 vs. 27.6h) (95%CI 1.12-1.68) than the control group.
2. What was the estimated treatment effect at a 95% confidence interval? (Precision)	As above.
V. **Will the results help me in caring for my patients? (Applicable?)**	
1. Were the study patients similar to my patient?	Yes. Maybe. Period of ED observation not reported. Half of eligible patients were not included. Why? Seem to have a lower threshold for admission with less sick patients.
2. Were all clinically important outcomes considered?	Would've liked to hear about respiratory rate or perceived WOB, Anything else worth including? Urine specific gravity, exercise O2 sat, evidence of

	clinical dehydration, ?
3. Are the likely treatment benefits worth the potential harm and costs?	Yes. Revisits the question of O2 sats as a prognostic indicator.

Limitations:

1. **No assessment of neurocognitive outcomes, but risk is low or absent with infants with oxygen sats 90% and above.**
2. **Did not assess safe oxygen sats in the ED.**
3. Was not an ED study and unclear how to apply their findings in an ambulatory setting
4. Their patient population included in this study may be less ill that who we typically admit.
5. No standardized approach to defining their admission criteria
6. Who were the managing clinicians and what were their levels of training/experience
7. No standardized assessment tool to measure cough

Clinical Bottom Line:
I agree with their conclusion:
Management of infants with bronchiolitis to an oxygen saturation target of 90% or higher appears to be safe and clinically effective as one of 94% or higher.