

Home O₂ Protocol Cuts Bronchiolitis Admissions

VITALS

Major Finding: The overall rate of admission for bronchiolitis fell from about 40% before implementation of the home oxygen protocol to 28% afterward.

Data Source: A retrospective study of 5,065 cases of bronchiolitis seen in the ED of a tertiary-care children's hospital, 13% of whom were managed with home oxygen therapy.

Disclosures: None was reported.

BY SUSAN LONDON

FROM THE ANNUAL MEETING
OF THE PEDIATRIC ACADEMIC SOCIETIES

VANCOUVER, B. C. — Selected children with bronchiolitis seen in the emergency department can be safely managed with home oxygen therapy and thereby avoid hospital admission, according to Dr. Sarah M. Halstead.

In a retrospective study of more than 5,000 pediatric cases of bronchiolitis with hypoxia seen in the emergency department (ED), only 6% of children sent home on oxygen had to be admitted to the hospital at a later time.

None of them had adverse outcomes or required intensive care or placement of an advanced airway, Dr. Halstead reported.

Moreover, the ED's overall rate of hospital admission for children with bronchiolitis fell by about a third from historical levels before the home oxygen

protocol was used, based on results reported at the meeting. "To improve clinical care, we hope that this data, which does support the safety of a home oxygen program for patients with bronchiolitis seen in the ED, will encourage other institutions to consider similar home oxygen protocols," Dr. Halstead, the lead investigator, said in a poster.

"Increasing ED overcrowding and boarding of inpatients makes the development and analysis of this and other novel outpatient care strategies imperative," she added.

The investigators used electronic medical records to assess outcomes among children aged 1-18 months seen in the ED with bronchiolitis during the 2005 through 2009 bronchiolitis seasons, a period when the ED had a home oxygen protocol in place.

Children with cardiopulmonary conditions who required oxygen at baseline were excluded.

"Prior to discharge on home oxygen, we observed patients in the ED for 8 hours," explained Dr. Halstead, a pedia-

trician at the Children's Hospital in Aurora, Colo.

"If they had oxygen saturations of greater than 90% on half a liter or less of nasal cannula oxygen, they were able to maintain adequate hydration without frequent deep suctioning, they had no signs of respiratory deterioration, and both the caregiver and the attending were comfortable with discharge home, then a follow-up appointment was arranged and ... home oxygen was supplied for the family," the pediatrician said.

Study results were based on 5,065 cases of bronchiolitis seen in the ED, 13% of whom were discharged on home oxygen therapy.

Within this group, only 6% had to be admitted at a later time—a value that did not differ significantly from the 4% seen among children discharged on room air.

The leading reason for admission after a discharge on home oxygen was an increased oxygen requirement (51%), followed by increased work of breathing (46%), parental concern or compliance issues (24%), a need for intravenous fluids (8%), and difficulties with home oxygen therapy (5%).

"There were no adverse outcomes, ICU admissions, or need for advanced airways in any of these patients," Dr.

Halstead reported at the meeting.

The ED's overall hospital admission rate for bronchiolitis (which captured both children initially admitted and children admitted after initially being sent home) was 28% during the study period—substantially lower than the 39%-40% seen historically before implementation of the home oxygen protocol.

Because some children sent home on oxygen may have been admitted later to outside institutions, the admission rate found in the study may be an underestimate, Dr. Halstead said.

She attributed the success of the home oxygen protocol in large part to support from respiratory therapists and primary care providers.

"We have respiratory therapists available in the ED 24 hours a day, 7 days a week.

"They perform home oxygen teaching and arrange for oxygen to be delivered to the family," she noted.

"We also have support from the [primary care providers] in the community who have made themselves available for follow-up within 24 hours of discharge.

"They are comfortable caring for their patients on home oxygen, including weaning them off oxygen in an outpatient setting," Dr. Halstead commented. ■

Postnatally Acquired CMV Infection Caused Severe Illness

BY SUSAN LONDON

FROM THE ANNUAL MEETING
OF THE PEDIATRIC ACADEMIC SOCIETIES

VANCOUVER, B. C. — Postnatally acquired cytomegalovirus infection can cause severe illness in very low-birth-weight infants in the short term, based on findings from a retrospective study.

Infants in the study who became infected and symptomatic with cytomegalovirus (CMV) infection in the postnatal period had high rates of complications.

In fact, their clinical and laboratory findings were similar to those of congenitally infected infants.

"The biggest take-home message is that postnatal CMV infection can cause significant morbidity, and it can potentially lead to [poor] long-term outcomes," lead investigator Dr. Sarah A. Meyer said in an interview.

"It is often something that we don't think about a lot, and we just need to keep it in our mind that if we have babies that present with some of these symptoms, we should be testing them and following their outcomes," she said.

Much is known about congenitally acquired CMV, according to Dr. Meyer of Children's Hospital Boston. But comparatively little is known about CMV acquired in the postnatal period through breast milk.

Using hospital records for the years 1997-2009, she and her colleagues retrospectively studied 34 infants who had symptomatic, culture-positive CMV infection and were cared for in a neonatal intensive care unit.

Of the infants (all but 1 of whom met criteria for very low birth weight [VLBW]), 22 had been infected postnatally, whereas the other 12 infants (having a range of birth weights) had been infected congenitally.

Compared with their congenitally infected counterparts, the postnatally infected infants had a lower me-

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Major Finding: Very low-birth-weight infants with symptomatic, postnatally acquired CMV infection had high rates of pneumonitis (73%) and late-onset sepsis (43%).

Data Source: A retrospective cohort study of 34 infants with symptomatic CMV infection.

Disclosures: None was reported.

dian birth weight (688 vs. 1,500 g), had a younger median gestational age (26 vs. 32 weeks), were older on the day of diagnosis (52.5 vs. 3.5 days of life), and were more likely to have been breastfed (100% vs. 67%).

The proportions delivered by cesarean section were similar, she reported in a poster at the meeting.

Among those infected in the postnatal period, the time to CMV diagnosis was correlated with the length of exposure to breast milk ($r = 0.84$), indicating that the risk of viral transmission persisted with continued exposure. In contrast, the time to CMV diagnosis was not correlated with the day of life on which infants were first fed breast milk.

The most common complications with postnatal infection were pneumonitis (present in 73% of infants), colitis (50%), hepatosplenomegaly (36%), and intracranial findings (27%).

Relative to their congenitally infected counterparts, postnatally infected infants had generally similar clinical findings, but were more likely to have pneumonitis (73% vs. 0%) and less likely to have petechiae and purpura (10% vs. 50%) and retinitis (0% vs. 25%).

The two groups were also similar in rates of hematologic and cerebrospinal fluid laboratory abnormalities, presence of cerebrospinal fluid CMV positivity by polymerase chain reaction testing, and median blood CMV viral load.

Among the 15 infants overall with neurologic follow-up, the rate of hearing loss was 71% in those congenitally infected, compared with 13% in those postnatally infected, with numbers too small to permit statistical comparison.

Rates of developmental delay and cerebral palsy were similar, although these sequelae in the postnatally infected infants also could have been related to their prematurity, noted Dr. Meyer.

A final analysis did suggest that symptomatic postnatal CMV infection may add substantial morbidity above and beyond that due to having a very low birth weight, she said.

Compared with 1,226 infants from the general VLBW population, the VLBW infants with postnatal cytomegalovirus infection had a higher rate of bronchopulmonary dysplasia (81% vs. 16%) and late-onset sepsis (43% vs. 18%).

Rates of necrotizing enterocolitis and intraventricular hemorrhage did not differ significantly between the two groups.

Dr. Meyer said that teasing out causal associations is difficult in the VLBW population.

"Whether or not these babies are immunosuppressed to begin with and that predisposes them to late-onset sepsis and acquiring CMV, or acquiring CMV reduces their immunity level and that predisposes them to late-onset sepsis—which one came first is not exactly clear," she explained.

"Hopefully, that can be separated out in future studies."

Monitoring infants with postnatally acquired CMV infection long term, while important, is just an initial step, according to Dr. Meyer.

"An area of study that is still really needed is to look at how treating babies with antivirals affects their outcomes," she said. ■