AAP News™

Evidence lacking on routine use of postnatal corticosteroids in preterm infants: AAP

May 30, 2022

Arun Pramanik, M.D., FAAP

Article type: AAP Policy

Topics: Fetus/Newborn Infant, Pulmonology

The AAP has updated its guidance on the use of postnatal corticosteroids (PCS) to prevent or treat early chronic lung disease (CLD), also referred to as bronchopulmonary dysplasia.

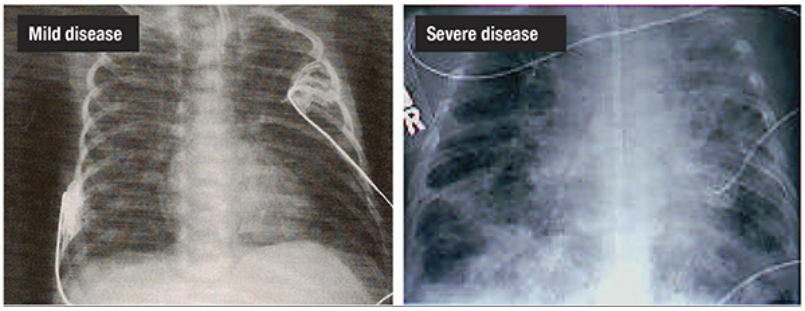
The use of PCS increases the rate of survival in infants without severe CLD but may have short- and long-term risks. Use of hydrocortisone at or before age 7 days may prevent CLD or death in infants weighing less than 1,000 grams (g) exposed to chorioamnionitis. In premature infants ages 7-28 days who remain on significant ventilator support, low dose dexamethasone (<0.2 mg/kg/day) may be helpful if they do not have severe lung disease.

Inhaled corticosteroids are not advantageous and may increase the risk of mortality. However, corticosteroids are helpful when instilled with surfactant as a vehicle into lungs of patients with respiratory distress syndrome, although long-term data are lacking.

It is important to note that data from randomized, controlled trials may not be applicable to the care of individual patients. Additional data on long-term effects on school-age children and adults are needed to further guide use of PCS to prevent or treat CLD in preterm infants.

The policy statement *Postnatal Corticosteroids to Prevent or Treat Chronic Lung Disease Following Preterm Birth*, from the AAP Committee on Fetus and Newborn, is available at https://doi.org/10.1542/peds.2022-057530 and will be published in the June issue of *Pediatrics*. It is updated from 2010.

The current terminology CLD focuses on clinical outcomes rather than pathologic correlates. Chronic



Chest X-rays of newborn infants with chronic lung disease of prematurity.
Courtesy of Arun Pramanik, M.D., FAAP

respiratory and cardiovascular impairments, growth failure and neurodevelopmental handicaps associated with it require close follow-up by pediatricians often in conjunction with subspecialists.

In the U.S., CLD in preterm infants remains the most common cause of chronic respiratory disease, affecting approximately 15,000 patients annually. An estimated 35% to 50% of infants weighing less than 1,000 g at birth are affected. They may require multiple hospitalizations due to infections and/or wheezing.

Various modalities of corticosteroids have been used either to replace cortisol deficiency or decrease inflammation in premature infants. Although use of antenatal corticosteroids is an established preventive strategy in mothers with premature labor, postnatal use of corticosteroid remains controversial.

For this policy update, prospective, randomized, controlled clinical trials since 2010 were reviewed with a focus on four areas: type of corticosteroids used (dexamethasone, hydrocortisone and others); intended purpose (prevention or treatment of CLD); dose administered (low or high); and route of administration (systemic or inhaled).

Dexamethasone and hydrocortisone were extensively studied. Use was arbitrarily divided into early (prevention; £7 days of age) and late (treatment; started at 7-28 days of age). Because dosing may affect the risk and benefit to patients, a discussion was added on effects of low vs. high dosing of PCS.

Dexamethasone

Meta-analysis of studies on early use dexamethasone for prevention of CLD concluded that it was beneficial (successful extubation and increased survival without CLD at 36 weeks' postmenstrual age). No difference was observed in mortality. However, rates of hyperglycemia, hypertension, hypertrophic cardiomyopathy, gastrointestinal bleeding/perforation and growth failure were higher.

Therefore, if dexamethasone is used, monitor for side effects.

Late dexamethasone treatment of CLD in preterm infants older than 7 days was both beneficial and harmful, similar to prevention. Hence, it would be prudent to administer it in infants who cannot be weaned from mechanical ventilation, using the minimum dose for the shortest duration and monitoring for side effects.

Hydrocortisone

Because of relative cortisol deficiency, hydrocortisone has been used for prevention of CLD in extremely low birth weight infants. Treatment with hydrocortisone has been used in patients who cannot be weaned from a ventilator.

In a recent study of 800 infants born at less than 30 weeks' gestational age who remained intubated more than seven days and intubated for seven to 14 days, hydrocortisone facilitated extubation, but survival

without CLD was not improved. Survival without moderate or severe neurodevelopmental impairment was similar to that in the placebo group.

Inhaled corticosteroids

Data are insufficient to make any recommendation regarding use of inhaled corticosteroids to treat CLD.

Outcome at school age

In a few studies, preterm infants receiving PCS showed decreased growth and lung function with neurodevelopment impairment relative to term infants, but they did not differ from control cohorts. Most studies, however, were contaminated by high use of open-label PCS. Hence, further long-term studies are required.

Recommendations

- Postnatal corticosteroids should not be used routinely.
- The decision to use postnatal corticosteroids to prevent or treat CLD should be individualized and made with parents. Discussions should be documented in the patient's medical record.
- If a decision is made to administer postnatal corticosteroid, a low dose should be given for a short, predefined duration, such as for extubation. If the infant does not respond to PCS within three days, continued treatment is not recommended.
- High-dose PCS are not recommended to prevent or treat CLD in preterm infants.
- Indomethacin and ibuprofen should not be used concurrently with PCS.

Dr. Pramanik is a lead author of the policy and member of the Committee on Fetus and Newborn.