Healio (17.03)

Breastfeeding reduces risk for lower respiratory tract infections, asthma in infants

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Breastfeeding mitigated the risks for developing lower respiratory tract infections in infancy and for developing asthma and allergic rhinitis in childhood, according to a study published in *The Journal of Allergy and Clinical Immunology*.

"The impact of breastfeeding on certain childhood respiratory diseases is still controversial, with some studies actually showing that breastfeeding could increase the risk for some chronic lung diseases in children, such as asthma," **Christian Rosas-Salazar, MD, MPH,** assistant professor of pediatrics at Vanderbilt University Medical Center, told Healio.

To better understand the effect of breastfeeding on pediatric respiratory health, Rosas-Salazar and colleagues evaluated data of 1,949 healthy infants (median age, 55 days; interquartile range [IQR], 16-78 days; 47.67% girls; 65.11% non-Hispanic white; 31.4% born via cesarean section) in a population-based cohort who were followed via passive and active surveillance, including in-person respiratory illness visits and viral testing, between November and March of their first year. Only 1,495 (76.71%) of the enrolled infants had 4-year data available.

The researchers also monitored cytokines in the upper respiratory tract (URT) and gut microbiomes of these infants, while parents reported the type of feeding they provided their infants as well as the duration of any breastfeeding.

The median duration of exclusive breastfeeding among the total infants enrolled was 6 weeks (IQR, 0-20 weeks).

The URT and gut microbiomes of the infants who had been exclusively breastfed had the lowest values of alpha diversity metrics at enrollment. Also at enrollment, the beta diversity of the URT and gut microbiomes differed by type of feeding ($P < .01$), and there were multiple differences in the abundance of URT and gut genera by type of feeding.

The researchers additionally found associations between the type of breastfeeding and the levels of pro-inflammatory cytokines but not with levels of pro-allergic cytokines.

Overall, 440 infants (22.58%) developed a lower respiratory tract infection (LRTI) during infancy, 209 (10.72%) developed a 1-year food sensitization, 286 (14.67%) developed 4-year current asthma and 516 (26.48%) developed 4-year ever allergic rhinitis.

Analyses also showed a dose-response effect of the type of feeding at enrollment on an LRTI in infancy and 4-year current asthma, with infants who were exclusively breastfed at enrollment having the lowest odds of these outcomes. However, there was no association between type of feeding at enrollment with 1-year food sensitization or 4-year ever allergic rhinitis.

Additionally, the duration of exclusive breastfeeding had a protective dose-response effect on LRTI in infancy, 4-year current asthma and 4-year ever allergic rhinitis. Each 4 weeks of exclusive breastfeeding decreased the odds of an LRTI in infancy (OR = 0.95; 95% CI, 0.91-0.99), 4-year current asthma (OR = 0.95; 95% CI, 0.9-0.99) and 4-year ever allergic rhinitis (OR = 0.95; 95% CI, 0.92-0.99) by approximately 5%.

Exploratory analyses further showed a significant mediating effect of the beta diversity of the gut microbiome, but not of the URT microbiome, on the association between exclusive breastfeeding and 4-year current asthma.

The beta diversity of the early-life URT and gut microbiomes, as well URT cytokines in infancy, did not show any mediating effects on the associations between exclusive breastfeeding and other clinical outcomes.

“The results of our study suggest that exclusive breastfeeding protects against the risk for lower respiratory tract infections such as bronchiolitis or pneumonia, asthma and hay fever in young children,” Rosas-Salazar said. “Furthermore, we show that these effects are likely due to the impact of exclusive breastfeeding on the early-life microbiome.”

Noting these benefits, the researchers recommended that doctors discuss the effects of breastfeeding on respiratory health with their patients.

“Health care providers should continue to strongly recommend exclusive breastfeeding to their patients, and they can add the protective effects of exclusive breastfeeding on common childhood respiratory diseases as one of the potential benefits,” Rosas-Salazar said.

Longer durations of exclusive breastfeeding likely offer the most protection, the researchers continued, with nonexclusive breastfeeding in the first few months possibly offering benefits as well.

“Understanding if exclusive breastfeeding impacts the development of lung diseases in older children or even adults is an important next step of our study,” Rosas-Salazar said.