More girls than boys benefit from breastfeeding, research shows

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Challenging the long-standing belief that breast-feeding equally protects all babies against disease, research led by Johns Hopkins Children's Center investigators suggests that when it comes to respiratory infections, the protective effects of breast milk are higher in girls than in boys.

Following 119 premature babies in Buenos Aires through their first year of life, researchers found that breast-feeding not only offered more protection to girls than boys, but also that formula-fed girls had the highest risk for severe respiratory infections.

The findings, reported in the June issue of *Pediatrics*, cast doubt on the theory that immune system chemicals contained in breast milk and passed directly from mother to newborn are responsible for preventing the infections. If this were the case, researchers say, both boys and girls would likely derive equal protection.

In addition, breast-feeding did not appear to affect the number of infections, but rather their severity and the need for hospitalization, meaning that breast milk does not prevent a baby from getting an infection, but helps a baby cope with an infection better.

"In light of these results, we are starting to think that milk does not directly transfer protection against lung infections but instead switches on a universal protective mechanism, already in the baby, that is for some reason easier to turn on in girls than in boys," says senior

investigator Fernando Polack, M.D., an infectious disease specialist at Hopkins Children's.

Shortly after birth, formula-fed girls were eight times more likely than breast-fed girls to develop serious respiratory infections requiring hospitalization, the study results showed. Formula-fed girls were also more likely to develop such infections than both breast-fed and non-breast-fed boys.

The findings, researchers say, are particularly important for healthcare in developing countries, where antibiotics and other treatments are scarce and where an estimated one-fourth of premature babies end up in the hospital with severe respiratory infections.

"When resources are limited, it helps to know that your high-risk group is formula-fed girls," Polack says. The findings also suggest that the mothers of premature girls should be strongly encouraged to breast-feed, investigators say.

In the United States, by contrast, drugs are readily available to prevent complications and hospitalizations are less frequent. However, researchers point out, because these drugs protect against only two of many respiratory viruses and are expensive, mothers should breast-feed both girls and boys when possible. Despite gender differences in the levels of protection against respiratory illness, researchers say that breast-feeding remains the best nutrition for both full-term and premature infants, regardless of sex, and that breastfeeding's benefits extend to brain development and general health.

For the study, investigators tracked responses to a first infection after birth and found that breast-fed girls were the least likely to be hospitalized with an acute respiratory disease. Only 6 percent (two of 31) of breast-fed girls had first infections severe enough to require

hospitalization compared to 50 percent (12 out 24) of the non-breast-fed girls. There was virtually no difference in hospitalization for first infection in breast-fed versus non-breast-fed boys, with 18 percent from both the breast-fed and non-breast-fed groups developing severe respiratory infections. This pattern repeated itself throughout the first year of life and in subsequent infections, with breast-fed girls showing fewer complications and hospitalizations than both formula-fed girls and breast-fed and formula-fed boys. In the first year of life, formula-fed girls continued to have the highest risk for severe respiratory disease and hospitalization.

If breast milk does indeed trigger a universal - but variably activated - protective mechanism against multiple viruses, the next step is to figure out exactly how this mechanism gets switched on and why it is relatively harder to activate in boys.

"Unraveling this mechanism may one day lead to broad-based therapies that might be as effective as five or six vaccines," Polack says, because vaccines have a narrow spectrum of defense and work only against specific viruses.

Source: Johns Hopkins Medical Institutions