National Center for Early Development & Learning

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Respiratory Infections

Excerpts from a paper presented during the "Research Into Practice in Infant/Toddler Care" synthesis conference by the National Center for Early Development & Learning (NCEDL) in the fall of 1997 in Chapel Hill, NC. Drs. Albert M. Collier and Frederick W. Henderson presented their data and surveyed current literature for their paper, "Respiratory Disease in Infants and Toddlers," which is expected to be part of a book to be pubished later.

Respiratory infections challenge child care centers

The prevention of respiratory infections in child care centers remains a public health challenge. A survey of current literature reveals no published data describing a successful intervention to reduce the risk of upper respiratory diseases in day care centers.

Respiratory infections account for 75% to 90% of infections in child care settings, according to several large studies. In a study at the Frank Porter Graham Child Development Center (FPG), Chapel Hill, NC, of 206 children followed for 864 child-years, infants less than a year old had an average of nine respiratory illnesses a year of which 46% were associated with otitis media and 13% with lower respiratory manifestations.

Research shows that viral respiratory tract infections peak during the second six months of life, between seven months and one year. During this period, the level of antibodies is at its lowest level in life. That's because of the decreasing level of antibodies passed across the placenta from the child's mother during pregnancy and the fact that it takes the child's immune system about two years to begin producing antibody levels approaching those of a mature child.

Child care and respiratory infections

- Children under the age of three who attend child care have more respiratory infections than children of the same age who are cared for at home. The severity of these infections in young children is also greater.
- Children who are routinely in contact with only three children daily rather than 30 children have less of a chance of coming into contact with an infectious agent.
- Children attending child care will be infected with viral respiratory infections earlier than children living at home with no siblings in school.

(continued on reverse)

For more information, contact Loyd Little at 919-966-0867 or email <loyd_little@unc.edu>. Visit our web site at <www.NCEDL.org>.

Attempts to reduce infections in child care centers

Curiously enough, a synthesis of research reveals no evidence that excluding sick children from a child care center reduces the incidence of acute respiratory disease. Children with viral respiratory infections excrete the infectious virus two to four days before they show signs and symptoms of the infection. In a study by FPG researchers, a hygienic intervention was conducted at a random selection of child care centers at the same time as another random group of centers received no intervention. The intervention included such things as

- handwashing of children and staff;
- disinfecting the toilet and diapering area;
- physical separation of diapering area from food preparation and service areas;
- hygienic diaper disposal;
- daily washing and the disinfecting of toys, sinks, and kitchen and bathroom floors;
- daily laundering of blankets, sheets, dress-up clothes, and other items; and
- hygienic preparing, serving and cleaning up of food.

No significant difference in the rates of illness from respiratory tract infections was found in centers with interventions and those without. **(It should be noted that while hygiene measures such as those above have not been proven effective in preventing respiratory tract infections, they have been in diarrheal diseases.)**

Future research suggestions

One strategy for future research in the control of respiratory tract infections in child care would be to increase the individual child's immunity to the most important respiratory agents. This should be approached first by making sure that the children and child care staff are fully vaccinated on schedule for vaccine-preventable respiratory illness.

In the near future, vaccine development will certainly focus on the respiratory syncytial, parainfluenza, and influenza viruses. Adenoviruses could also be an important target for prevention.

Second, research could focus on maternal immunization during pregnancy to optimize the level of antibodies in the mother to a particular respiratory tract pathogen. Passive antibodies would then be at a high level to pass across the placenta to the newborn. As the mother's passive antibodies disappear, the child might then be immunized with new vaccines against common respiratory pathogens.

Drs. Collier and Henderson are pediatricians at UNC-CH. NCEDL is administratively housed at UNC-CH. This project is supported under the Education Research and Development Centers Program, PR/award number R307A960004, as administered by the Office of Educational Research and Improvement, U.S. Department of Education. Opinions expressed in these reports do not necessarily represent the positions or policies of the National Institute on Early Childhood Development and Education <www.ed.gov/offices/OERI/ECI/>, the Office of Educational Research and Improvement, or the U.S. Department of Education.