Early childhood bronchiolitis increases asthma risk in adulthood

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Persons who have had bronchiolitis in early childhood have an increased risk of asthma at the age of 28-31 and a weaker health-related quality of life than their peers. In lung function tests, they also demonstrate changes indicative of irreversible airway obstruction, according to a new study from the University of Eastern Finland.

Bronchiolitis and pneumonia are common lower respiratory tract infections in early childhood. During their first year, around 30 per cent of children have bronchiolitis, leading to hospitalization in 1 to 3 per cent. In early childhood, the respiratory syncytial virus (RSV) is the most common cause of bronchiolitis and pneumonia. Childhood bronchiolitis and pneumonia have been associated with respiratory diseases, such as asthma, chronic obstructive pulmonary disease and lung disorders in adulthood. However, most of the evidence linking lower respiratory tract infection in early childhood to adulthood prognosis comes from retrospective studies. Earlier research has also found that persons who have had a lower respiratory tract infection in early childhood have a weaker health-related quality of life than their peers later in childhood, but it hasn't been studied whether this effect extends to quality of life in adulthood.

The initial data for the PhD thesis of Katri Backman, MD, was collected in 1981-1982. The study involved 83 children diagnosed with bronchiolitis and 44 children diagnosed with pneumonia. All were under the age of two and hospitalized. The viruses causing the infections were analysed from nasopharyngeal secretion samples upon admission. The

study cohort has been monitored since the 1980s. In 2010, 48 former bronchiolitis patients, 22 pneumonia patients and 138 controls were invited to a clinical follow-up study at the age of 28-31. Saint George's Respiratory Questionnaire (SGRQ) was used to assess their health-related quality of life. The participants underwent a clinical medical examination, skin prick testing, exhaled nitric oxide measurement, a two-week peak expiratory flow (PEF) monitoring, and a spirometry with bronchodilatation test (BD).

At the age of 28-31, asthma had been diagnosed in 31 percent of the bronchiolitis group, in nine per cent of the pneumonia group, and in 11 per cent of the control group. In the bronchiolitis group, the prevalence of asthma was significantly higher than in the other groups. In persons who had suffered a lower respiratory tract infection caused by RSV with wheezing, the prevalence of asthma was higher than in peers. Lung function measured by spirometry was weaker in persons who had had bronchiolitis than in peers. They also demonstrated changes indicative of irreversible airway obstruction in adulthood. Similar, yet milder changes were also observed in persons who had had pneumonia. The SGRQ scores of the bronchiolitis and pneumonia groups were higher than those of the controls, indicating a weaker health-related quality of life in adulthood due to respiratory symptoms and related harm.

The study showed in a prospective setting that the majority of adults who have had a lower respiratory tract infection in early childhood are symptom-free. However, in persons who suffered a bronchiolitis or a lower respiratory tract infection caused by RSV with wheezing in early childhood, the risk of asthma is elevated at the age of 28-31. Lung function changes indicative of irreversible airway obstruction in persons who have had bronchiolitis in early childhood suggest an elevated risk of chronic obstructive pulmonary disease later in life. The results also indicate a weaker health-related quality of life in adulthood for childhood bronchiolitis and pneumonia patients.

The findings were originally published in *Respiratory Medicine, Pediatric Pulmonology, Acta Paediatrica*, and *Pediatric Allergy and Immunology*.

More information: Katri Backman et al. Low eosinophils during bronchiolitis in infancy are associated with lower risk of adulthood asthma, *Pediatric Allergy and Immunology* (2015). DOI: 10.1111/pai.12448

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