VACCIREVIEW

Primary care RSV disease characteristics in infants and young children in Germany, data from the prospective papi surveillance network, 2021–2023

Bibliography

Kiefer A, Twardella D, Bähre J, Behrens C, Buck T, Eberhardt F, Bangert M, Kramer R, Gerber A, Rosewich M, Schaaff F, Höpner JH, Panning M, Kabesch M, Happle C, Wetzke M. Primary care RSV disease characteristics in infants and young children in Germany, data from the prospective PAPI surveillance network, 2021–2023. Int J Infect Dis. 2026;xx(xx):xx–xx. doi:10.1016/j.ijid.2026.108509.

Summary

This prospective, multicenter study describes the clinical characteristics, risk factors, and treatment burden of respiratory syncytial virus (RSV)–associated lower respiratory tract infections (LRTIs) in infants and young children managed in primary care in Germany in the seasons 2021–2023. The authors focus on non-severe RSV disease in the outpatient setting, which represents the majority of RSV infections but is less well characterized than hospitalized cases. The work aims to provide baseline data prior to the broad implementation of new RSV immunization strategies, such as maternal vaccination and long-acting monoclonal antibodies.

The analysis is embedded in the Pediatric Airway Pathogen Incidence (PAPI) network, a multicenter, prospective surveillance platform. Children aged ≤24 months presenting to one of five pediatric outpatient practices with signs or symptoms of LRTI were consecutively screened between autumn 2021 and spring 2023, covering calendar weeks 40–17 in each RSV season. Inclusion required at least one symptom or sign compatible with LRTI. In total, 1450 children were enrolled; the median age was 12 months, and just over half were male. All underwent nasopharyngeal swabbing, and multiplex PCR was used to detect a broad panel of respiratory viruses, including RSV A/B and rhinovirus/enterovirus, among others.

A viral pathogen was identified in 91% of children. Rhinovirus/enterovirus was the most frequent pathogen, detected in 55% of cases, followed by RSV, detected in 286 children, corresponding to 19.7% of the cohort. RSV showed clear seasonality, with distinct peaks during the observation period, whereas rhinovirus/enterovirus circulated year-round. More than half of RSV-positive children had viral codetections, most commonly with rhinovirus. Demographic parameters, including age, sex, and gestational age, did not differ substantially between RSV-positive and RSV-negative groups.

The study identified household and atopic factors associated with RSV infection. Preschool-aged siblings (0–5 years) were more frequently present in households of RSV-

positive children than RSV-negative children. In a multivariable logistic regression model adjusting for age, sex, gestational age, daycare attendance, older siblings, recruitment site, and allergic conditions, the presence of preschool-aged siblings was an independent predictor of RSV infection with a moderate increase in odds. A notable finding was the association between RSV and atopic conditions: atopic eczema and, to a lesser extent, food allergy were more common in RSV-positive than RSV-negative children. Atopic eczema remained independently associated with RSV infection in the adjusted model, suggesting a possible link between atopic status and susceptibility to RSV in this outpatient population.

Clinically, RSV-positive children exhibited a characteristic obstructive airway phenotype compared with those infected by other pathogens. Wheezing, crackles, tachypnea, wet cough, and abnormal auscultation findings such as rhonchi and prolonged expiration were significantly more frequent in RSV-positive cases. Reduced fluid intake was also more commonly reported in RSV-positive children, indicating greater systemic impact. Disease severity was quantified using the Pediatric Respiratory Severity Score (PRESS). While the overall cohort had predominantly mild disease, the proportion of children with moderate-to-severe illness (PRESS >1) was more than doubled in the RSV-positive group compared with RSV-negative children. About one-fifth of RSV-positive children with severe disease required hospitalization, and prior health care utilization for the same episode was more frequent in RSV-positive than RSV-negative cases.

Follow-up of RSV-positive children at 14 and, if needed, 28 days documented a substantial outpatient burden. Nearly all RSV-positive children (96.5%) received pharmacotherapy. The most frequently used treatments were inhaled short-acting beta-agonists, inhaled saline solutions, and antipyretics; antibiotics were prescribed in a small minority. By day 14, roughly one quarter of RSV-positive children had not fully recovered, although by day 28 only a small residual group remained symptomatic. The mean duration of illness was approximately 12 days. A small proportion required secondary hospitalization after enrollment, underscoring that a subset of initially outpatient-managed RSV-LRTI can progress.

In the discussion, the authors emphasize that RSV accounts for about one fifth of pediatric LRTI in primary care and is associated with a distinct clinical profile and higher morbidity than other respiratory viruses, even outside the hospital setting. They highlight the novel association between RSV infection and atopic eczema as a potential signal of shared pathophysiology or increased susceptibility, while acknowledging the possibility of confounding by health-seeking behavior. The authors argue that these prospective data characterize the outpatient RSV burden in Germany and provide an important

baseline against which to evaluate the impact of newly introduced RSV preventive interventions.

Comment

This study addresses an important gap by focusing on RSV disease in the outpatient pediatric setting, where most infections are managed but surveillance is limited. Its strengths include a prospective design, multicenter recruitment in routine pediatric practices, standardized clinical assessment, and comprehensive multiplex PCR testing for a broad range of respiratory viruses. The relatively large sample size of 1450 children and systematic follow-up of RSV-positive cases allow a robust description of clinical patterns, resource use, and short-term outcomes. The use of a validated severity score (PRESS) adds objectivity to comparisons of disease severity between RSV-positive and RSV-negative groups.

The identification of preschool-aged siblings and atopic eczema as independent predictors of RSV positivity is a particularly interesting contribution. The household effect is consistent with established transmission dynamics and provides practical information for risk stratification in primary care. The association with atopic eczema is novel in this context and hypothesis-generating with regard to shared epithelial barrier or immune mechanisms, especially given the broader literature linking early-life viral infections with later asthma and atopy.

Congratulations to the researchers for this much needed study, which should be a great starting point for future research including year-round observation (bi-annual epidemiological pattern?), additional geographies, socioeconomic structure, follow up on children with RSV plus with other pathogens to mention a few.

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