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BRIEF REPORT

Nirsevimab Prophylaxis Reduced Bronchiolitis, Hospitalizations and Intensive Care Admissions in Children up to 2 Years of Age

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The respiratory syncytial virus (RSV) is still the leading cause of hospitalisation for paediatric patients with acute respiratory illnesses [1]. Paediatric emergency department (PED) visits for bronchiolitis consistently increase during the winter epidemic seasons and these cause significant overcrowding and pressure on healthcare services [2].

In November 2022, the European Commission took a key step in preventing RSV when it approved nirsevimab, a monoclonal antibody with an extended half-life. Various trials and observational studies have consistently supported its efficacy [3].

Italy launched a nirsevimab immunisation campaign during the 2024–2025 RSV season, in line with international trends.

This study assessed the impact of nirsevimab prophylaxis on the incidence of bronchiolitis in children under 2 years of age who visited the PED at the University Hospital of Central Friuli in Udine, Italy. It also looked at how many were hospitalised, their clinical patterns and how they were managed. The hospital's PED handles about 20 000 visits and 1200 admissions each year.

We retrospectively collected bronchiolitis codes during two epidemic seasons before and after the immunisation program started: 1 October 2023 and 31 March 2024 and 1 October 2024 and 31 March 2025.

Children were excluded if they were diagnosed after they had reached 2 years of age or had been diagnosed with upper respiratory tract infections or respiratory distress due to other etiologies, such as laryngitis, or pneumonia.

The data collected from clinical charts and the electronic database included age, sex, gestational age at birth, comorbidities and initial peripheral blood oxygenation and respiratory rates. We also recorded maximal respiratory support: low-flow oxygen, high-flow nasal cannula, continuous positive airway pressure, non-invasive ventilation or mechanical ventilation. Data on other treatments and types of nutrition were also collected.

The study was approved by the University of Udine institutional review board (number 24/2025).

Continuous variables are reported as means and standard deviations and categorical variables as percentages or frequencies with 95% confidence intervals. Differences between the groups were evaluated using a *t*-test or the Mann–Whitney *U* test, based on the normality of the distribution. Fisher's exact test and the chi-square test compared frequencies and percentages. Univariate linear regression analysis assessed the trends over time of the weekly admissions during the two epidemic periods. A p-value of ≤ 0.05 was considered statistically significant. The statistical analyses were performed using GraphPad Prism version 8.4.2 for Windows (GraphPad Software, Massachusetts, USA).

Abbreviations: PED, paediatric emergency department; RSV, respiratory syncytial virus.

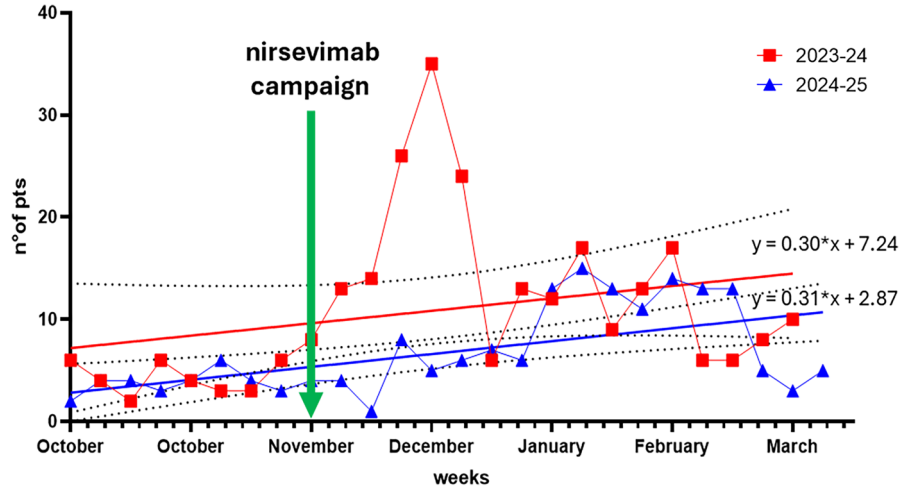

FIGURE 1 | Weekly trend in the number of bronchiolitis cases who accessed our PED during two epidemic seasons, before and after the introduction of nirsevimab: Red (2023–24) and blue (2024–25).

The study comprised 448 children with bronchiolitis: 271 (54.2% males) before and 177 (58.2% males) after the prophylaxis was introduced. Mean values showed that the children were significantly younger in the before than in the after group (8.6 ± 6.6 vs. 11.8 ± 6.8 months, $p < 0.001$) and the mean respiratory rate was higher (50.4 ± 10.2 vs. 46.6 ± 10.1 breaths per minute, $p < 0.001$). However, peripheral blood oxygenation values were similar (96.1% ± 2.4% vs. 96.3% ± 2.6%, $p = 0.53$).

The incidence of bronchiolitis reduced from 4.68 to 3.09 per 100 000. Total hospitalizations also fell significantly, from 41.3% to 29.3% ($p = 0.01$), with a particular reduction in intensive care unit admissions, from 11.8% to 4.5% ($p = 0.01$). PED visits per week significantly decreased, from 10.8 ± 8 to 6.8 ± 4.3 ($p = 0.026$), which was four fewer RSV patients per week (95% confidence interval −7.5 to −0.5) (Figure 1).

The before group required high-flow nasal cannulas more often than the after group (23.6% vs. 15.8% $p = 0.05$) and this was also the case for continuous positive airway pressure (9.6% vs. 3.4%, $p = 0.01$). There was no significant difference between the first respiratory support failure rates (26.2% vs. 28.6% $p = 0.85$).

Intravenous hydration and/or enteral nutrition via nasogastric tubes was administered more frequently to the before than after group (21.7% vs. 14.1%, $p = 0.047$). The use of bronchodilators and corticosteroids was lower in the before than after group (47.2% vs. 58.2%, $p = 0.026$ and 31.3% vs. 41.2%, $p = 0.03$ respectively), with no difference for antibiotics (14.0% vs. 18.6%, $p = 0.233$).

We found reduced incidences in bronchiolitis, hospitalizations and intensive care admissions in children up to 2 years of age after nirsevimab. These were broadly consistent with international studies [4], and may suggest that providing prophylaxis with nirsevimab reduced RSV severity and changed clinical patterns of bronchiolitis. The children's ages significantly increased and the use of bronchodilators and corticosteroids rose. This suggests that the typical patient profile changed. Before nirsevimab, hospitalized infants were generally younger, feeding poorly and required oxygen therapy. After nirsevimab, drugs not usually recommended for treating bronchiolitis, such as corticosteroids or bronchodilators, increased. This may have been due to the increase in patients who presented with wheezing.

Emerging evidence that suggests that nirsevimab prophylaxis may also help to prevent the onset of asthma [5] warrants further investigation by prospective longitudinal studies in hospital and community settings.

Our data showed that nirsevimab provided effective prevention for RSV. We need to discuss extending prophylaxis to all infants facing their first RSV season, regardless of their birth month. This broader strategy could ensure equitable protection and help to minimize the seasonal burden of RSV-related disease in infancy. Further studies should compare this approach in terms of coverage, feasibility, and long-term impact.

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The authors have nothing to report.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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