Impact of RSV Immunization with Nirsevimab (Beyfortus®) on RSV-Related Hospitalizations of Pediatric Patients in a Regional Hospital in Belgium

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Abstract
Respiratory infections caused by respiratory syncytial virus (RSV) are a significant cause of hospitalizations in young children. This study evaluates the impact of immunization with nirsevimab (Beyfortus®) on RSV-related hospitalizations and severity of outcome at Jessa Hospital, Belgium. Comparing pre- and post-immunization periods, data from the 2024–2025 RSV season show a reduction in hospitalizations, with a notable 78.7% decrease in infants under 6 months comparing to last season. Immunization resulted in reduced oxygen and Optiflow® need. Findings suggest that nirsevimab decreases hospitalizations and severity of RSV infections.

Introduction

Respiratory infections caused by respiratory syncytial virus (RSV) are the leading cause of hospitalization among young pediatric patients (1). Recently, immunizations have been developed to protect children against RSV. Nirsevimab (Beyfortus®) is a monoclonal antibody targeting the RSV F protein, developed to reduce severe RSV infection (e.g., hospitalization) in young infants. Since June 2024, this immunization is reimbursed in Belgium. Starting from October 2024, parents have been able to immunize their children against RSV, with reimbursement for all infants born after April 1, 2024, and all neonates born after October 1, 2024.

Objectives

This study aims to evaluate the impact of RSV immunization with nirsevimab on the number of hospitalizations, severity of outcome, and mortality due to RSV in children.

Methods

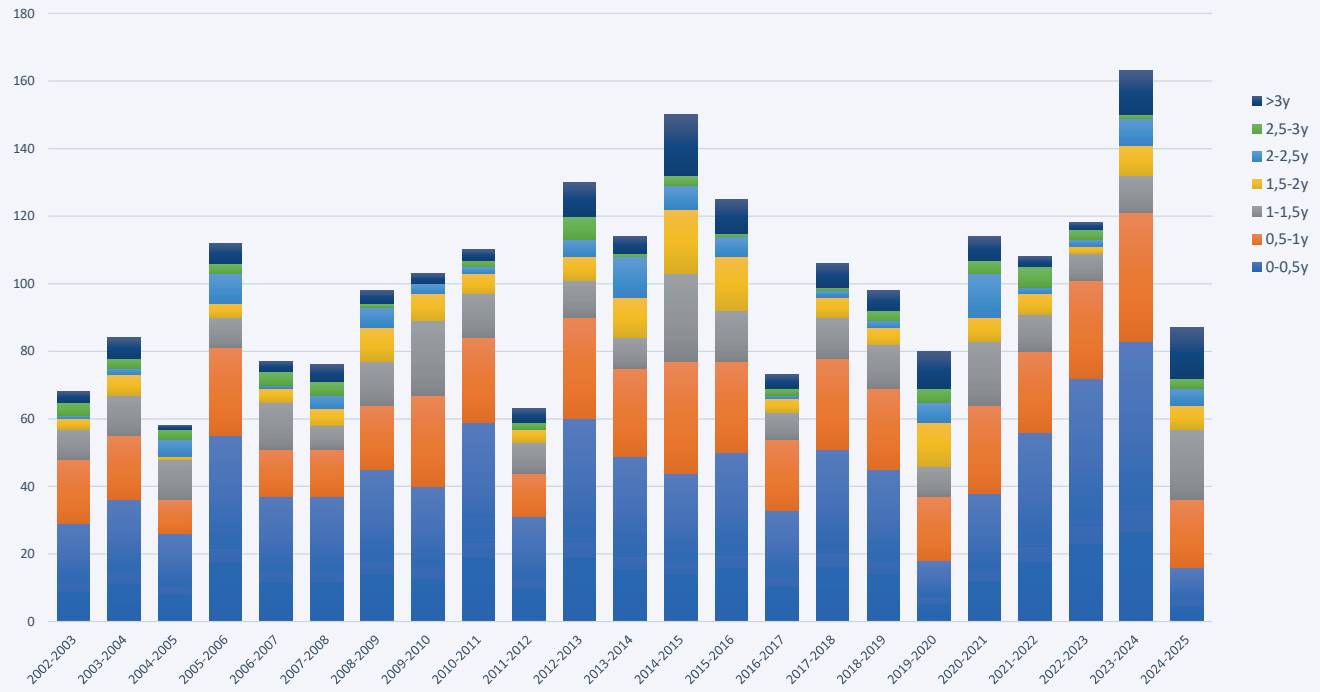
This retrospective study was conducted at Jessa Hospital in Hasselt, Belgium. Since 2002, epidemiological data on all RSV hospitalizations have been collected within this hospital. We included data up to February 2025 to compare the number of hospitalizations, morbidity and mortality rates during RSV seasons before and after the initiation of immunization with nirsevimab (Beyfortus®). All hospitalizations within the hospital were evaluated. In children with a positive RSV nasal swab, the reasons for admission, age, immunization status, and characteristics of the hospitalization (including oxygen need, Optiflow® need, intubation, or transfer to PICU (Pediatric Intensive Care Unit) were analyzed.

Results

During the RSV season 2024-2025 (October 2024 – February 2025), a total of 882 children were hospitalized at Jessa Hospital, of which 87 patients had a positive RSV nasal swab (9.8%). Among these 87 patients, 16 were younger than 6 months (18.39%), 20 were between 6 months and 1 year (22.98%), 28 were between 1 year and 2 years old (32.18%) and 23 were over 2 years old (26.43%). Out of the 87 hospitalized children, 21 were eligible for reimbursed RSV immunization, of which 8 children were effectively immunized with nirsevimab (9,19% of total RSV hospitalizations and 38.09% of children eligible for reimbursement).

Since 2002, in Jessa Hospital, we systematically collected data on the number of hospitalizations due to RSV infection. This extensive data collection allows us to compare the number of patients admitted monthly over a span of 23 years. Over the years, the average number of RSV hospitalizations has been 101,91 per season (58-160). With 87 this year, the number of hospitalizations is below the average, with a reduction of 14,63%. Looking at hospitalizations categorized by age, we see that in the 2024-2025 RSV season, 16 of the 87 children hospitalized were younger than 6 months (18.39%). This is a significant reduction in the number of children of this age compared to the 2023-2024 RSV season when 75 out of 160 patients (46.88%) and the 2022-2023 season, when 74 out of 122 patients (60.66%) were in this age group. We see a significant reduction of 78.7% of hospitalizations from children

FIGURE: RSV hospitalizations at Jessa hospital from 2002 to 2025, categorized by age.



younger than 6 months old compared to the 2023-2024 season. Figure 1 shows the number of RSV admissions by age from 2002 to 2025.

Looking at morbidity, we see that children who were immunized were significantly less ill. There was less need for oxygen therapy (3 children with nirsevimab versus 26 without immunization), less need for Optiflow® (1 child with nirsevimab versus 7 without immunization) and less need for transfer to the PICU (0 children with nirsevimab versus 2 without immunization). During this RSV season, no children were intubated, and no children died.

Conclusion

Our findings suggest that immunization with nirsevimab has a favorable impact and are consistent with real-life surveys in other countries (2). Primarily reducing the number of hospitalizations due to RSV, especially in young children less than 6 months old. Secondarily reducing the severity of RSV infections in immunized children. Larger national data analysis needs to confirm these local figures. The long-term effects and influence on RSV transmission require further investigation in upcoming seasons. Additionally, we question the potential impact of less stringent reimbursement criteria and the immunization of more children. Given the high cost of the treatment, the economic feasibility of reimbursement must also be considered. Further research and follow-up are needed to fully understand the overall impact of nirsevimab immunization.

The authors have no conflicts of interest in relation to the subject matter of this manuscript.

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