Hospitalizations related to respiratory viral infections in children under 5 years old in the VAHNSI framework during 6 consecutive seasons (2011/2012 to 2016/2017, Valencia, Spain)

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Introduction

Acute respiratory infection (ARI) is the main cause of morbidity and mortality worldwide. Influenza and respiratory syncytial virus (RSV), among other viruses, play a significant role in respiratory pathology, especially among young children.

Methods

The Valencia Hospital Network for the Study of Influenza and other respiratory viruses (VAHNSI) conducts annually a prospective, active-surveillance study. The current analysis was performed using data from 2011/2012 to 2016/2017 seasons (November to March-April) and was restricted to children under 5 years old (y.o.).

Figure 1: Map of the Valencia Region in Spain.

All consenting admissions of non-institutionalized children, resident in a participating hospital catchment area, not discharged from a hospital within 30 days and having been hospitalized within 7 days of the onset of symptoms were included in the study.

Demographic and clinical information was collected by interviewing the legal tutors and / or by clinical records review. Swabs were analyzed by real-time reverse transcription polymerase chain reaction (RT-PCR), and were tested for influenza, RSV, metapneumovirus, parainfluenza, rhinovirus/enterovirus, adenovirus, coronavirus and bocavirus. Incidence rates were calculated by virus, age group and season.

Results

Hospitalization incidence rates associated to respiratory viral infections were not constant across seasons, being higher in the last 3 seasons.

Figure 2: Respiratory viral infections (except RSV) in hospitalized patients under 5 years old in the Valencia Region tested by RT-PCR (rates per 100,000), seasons 2011-2012 to 2016-2017.

Figure 3: Percentages of respiratory viral infections in hospitalized patients under 5 years old in the Valencia Region tested positive by RT-PCR, seasons 2011-2012 to 2016-2017.

Differences across seasons were detected regarding the commonest virus as age increased. Globally, lowest rates were detected for metapneumovirus, adenovirus and parainfluenza.

Figure 4: Respiratory Syncytial Viral infections in hospitalized patients under 5 years old in the Valencia Region tested by RT-PCR (rates per 100,000), seasons 2011-2012 to 2016-2017.

In infants under 1 y.o. the highest hospitalization rate was detected for RSV in all the study seasons. In children 1 y.o. or over the highest rate was detected for different viruses (RSV, influenza or rhinovirus/enterovirus), depending on the season.

Conclusions

Children are a vulnerable population for admission due to respiratory viral infection. Preventive measures must be taken into account, especially for RSV in children less than 1 year old.