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BRIEF REPORT

ACTA PÆDIATRICA NURTURING THE CHILD WILEY

Paediatric hospitalisation numbers for influenza in 2016-2019 seasons underline importance of vaccination

Official Polish data, published by National Institute of Public Health, show that the flu season lasts from October to April of the following year, with the peak incidence between January and March. Since the beginning of the epidemic season 2018/2019, cases caused by influenza A virus constitute 99.1%, with 56.9% cases caused by the virus A/H1N1/pdm2009 and 43.1%—virus A/H3N2/pdm2009. The incidence of influenza caused by B virus was 0.9%.[1,2]

However, there is no detailed information on serotypes and influenza complications among hospitalised patients in Poland, especially among children. Therefore, we decided to assess the causes and course of hospitalisation due to influenza among children in one of the largest regions in Poland.

Considering these data and the fact that only 2.5% of the Polish population was vaccinated against influenza, our study is a valuable source of epidemiological information, and it can also be an argument encouraging parents to vaccinate against influenza.

Retrospective analysis based on hospital records, using J10 codes in the 10th revision of the International Classification of Diseases, was performed. Children under 18 years old hospitalised because of influenza from October 2016 to April 2019 in the Infectious Diseases Department, St Joseph's Hospital, Poznan, Poland, were included. The diagnosis was based on the positive result of a rapid immunochromatographic test (RDT) or RT-PCR. Analysis of clinical symptoms (fever, convulsions, headache, vomiting, pneumonia), type of treatment (oseltamivir, antibiotics), viral serotype and laboratory data (C-reactive protein level—CRP, platelet, white blood cell and neutrophil count) was performed. Diagnosis of pneumonia was confirmed by chest X-ray.

Statistical analysis was performed using PQStat 1.6.8.156. (PQStat Software, Wielkopolska, Poland). The significance was set at the level of $P < .05$.

From October 2016 to April 2019, 372 children with flu were hospitalised with 303 type A and 69 type B viruses. Most hospitalisations occurred from January to March, which in our climate is the winter season. Boys predominated (55.6%) and the median age in the entire group was 57 months. Patients younger than 6 months constituted approximately 8% of our group (Figure 1).

In our group, 20% of hospitalised children were previously diagnosed with coexisting chronic disease. The most common was asthma (11%), followed by cardiovascular disease (3%). None of the children from our group were vaccinated against influenza.

Type A influenza was detected more frequently. This was particularly evident in the 2016/2017 and 2018/2019 seasons. In the 2017/2018 season, type B influenza accounted for 43.8% of cases. The median age of children with type B influenza was significantly higher compared to children with type A influenza (76 versus 53 months, $P < .01$).

The average length of hospitalisation in the whole group was 6 days, but patients with type B influenza spent 1 day longer in hospital than patients with type A influenza ($P = .03$). Patients who had complications were treated longer, even up to 18 days.

All patients admitted to hospital due to influenza presented fever and cough. The most common complication was pneumonia, diagnosed in 25.5% of children. Neurological complications, such as seizures or syncopy, occurred in 9.1% of children with no comorbidities. Leukopenia and thrombocytopenia occurred in 5.6% of patients.

Complications were not related to the type of influenza, except pneumonia and haematological complications, which were more common in patients with type A influenza ($P < .01$ and $P = .01$, respectively). None of the other analysed clinical and laboratory parameters were significantly different in children infected with type A or B influenza virus.

In our group, 37.9% of children were treated with antibiotics.

Only two children, with influenza type A and pneumonia, were admitted to the intensive care unit during hospitalisation because of respiratory failure. One of them was a 2-month prematurely born boy, who recovered. The other was a 7-year-old boy, previously healthy, who died of acute respiratory failure.

In our region, each year around 0.69% of children with influenza are admitted to the hospital. Among outpatients, influenza is diagnosed based on symptoms. Therefore, many children do not have flu confirmation and are not treated before hospitalisation.

The main cause of hospitalisation is complications. Pneumonia associated with influenza has been documented in 25.5% of hospitalised children. In our study, younger children, especially those younger than 6 months, had the highest influenza-associated hospitalisation numbers. Similar observations were published by other authors.[3]

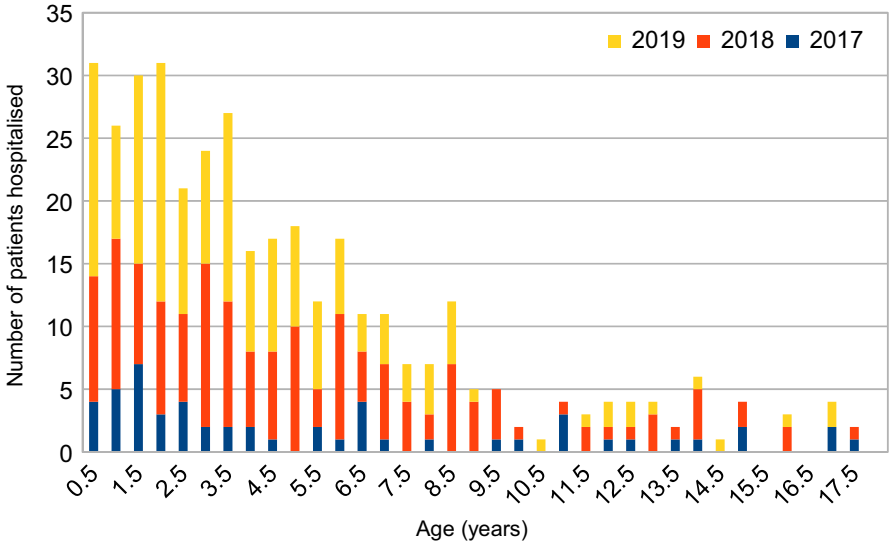

FIGURE 1 Age distribution of hospitalised influenza patients (n = 372) throughout the analysed period.

According to published data, mortality associated with paediatric influenza B infection was greater than that of influenza A.[4] We did not observe more severe course of infection caused by type B influenza—however, the number of patients infected with type B was very low comparing to type A.

In our analysis, the number of children hospitalised with influenza varied between seasons. During the period that we studied, every year there was a greater number of hospitalisations due to influenza; and approximately 80% of studied children had no comorbidities. The percentage of hospitalised children younger than 6 months also increased (7.6% in 2016% versus 16.9% in 2019). It highlights the variability in influenza activity and severity in each season.

Antibiotics were used in almost 40% of analysed children. Beyond any doubt, bacterial complications such as secondary pneumonia or otitis media are indications for antibiotics treatment. However, many children in our study received antibiotics for influenza symptoms.

Our findings stress the impact of severe influenza among children. Influenza is a common viral infection can lead to hospitalisation in a paediatric ward, ICU, or it can even lead to death. Many patients with influenza need medical care, diagnostic tests, such as chest X-ray, and treatment with antivirals or antibiotics. These results demonstrate that influenza infection can result in a substantial hospitalisation burden in children < 6 months of age. The increasing number of hospitalisations caused by influenza indicates the need for improvement in prompt diagnosis and treatment of outpatients. Even otherwise healthy children with no comorbidities can develop severe flu infection leading to hospitalisations. To conclude, vaccinations against influenza in Poland need to become widespread.

CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

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