

**1057. Factors Associated with Influenza A (H1N1)pdm09 (pH1N1) Vaccine Failure among Children Aged 5-17 Years**

Huong Mclean, PhD, MPH<sup>1</sup>; Jennifer King, MPH<sup>2</sup>; Maria Sundaram, MSPH<sup>2</sup>; Jennifer Meece, PhD<sup>3</sup>; Sarah Spencer, PhD<sup>4</sup>; Jin Hyang Kim, PhD<sup>4</sup>; Thomas Friedrich, PhD<sup>5</sup>; Brendan Flannery, PhD<sup>1</sup>; Alicia M. Fry, MD, MPH<sup>1</sup>; Edward Belongia, MD<sup>2</sup>; <sup>1</sup>Marshfield Clinic Research Foundation, Marshfield, WI; <sup>2</sup>Center for Clinical Epidemiology and Population Health, Marshfield Clinic Research Foundation, Marshfield, WI; <sup>3</sup>Integrated Research and Diagnostic Laboratory, Marshfield Clinic Research Foundation, Marshfield, WI; <sup>4</sup>Influenza Division, Centers for Disease Control and Prevention, Atlanta, GA; <sup>5</sup>Pathobiological Sciences, University of Wisconsin School of Veterinary Medicine, Madison, WI

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**Background.** Immunologic factors associated with influenza vaccine failure in children are not well understood. In 2013-14, we prospectively followed a cohort of vaccinated children 5-17 years old and examined factors associated with pH1N1 infection.

**Methods.** We recruited children who were enrolled in a study of influenza vaccine effectiveness during the prior 2012-13 season; all had medically attended acute respiratory illness, were tested for influenza, and had known vaccination history. Participants received one dose of 2013-14 vaccine, either inactivated influenza vaccine (IIV3) or quadrivalent live attenuated influenza vaccine (LAIV4), based on preference. Hemagglutination-inhibition (HI) titers against pH1N1 were measured

pre- and 21 days post-vaccination. Seroprotection was defined as HI titer  $\geq 1:40$ . Children  $< 9$  years were classified as partially vaccinated if they had received no prior dose of a vaccine containing pH1N1. Active surveillance was performed for acute respiratory illness; nasal and throat swabs from ill children were tested by RT-PCR. Cases were children with pH1N1 infection (vaccine failures); all other children served as controls. Logistic regression was used to assess factors associated with vaccine failure.

**Results.** During 2013-14, among 162 vaccinated children, 11 (7%) were pH1N1 cases. Eight (73%) cases and 54 (36%) controls had received 2013-14 LAIV4 ( $p = 0.02$ ). Postvaccination HI titers against pH1N1 were  $< 1:40$  in 10 (91%) cases and 34 (23%) controls ( $p < 0.001$ ). Compared to children 9-17 years, risk of vaccine failure was higher in children 5-8 years with no prior pH1N1 vaccination (OR 74; 95% CI 7.7, 720), and in children 5-8 years with  $\geq 1$  prior pH1N1 vaccinations (OR 5.9; 95% CI 1.2, 31). There were no differences between vaccine failures and controls by sex, high risk condition, history of influenza infection in 2012-13, or age at first influenza vaccination.

**Conclusion.** Vaccine failure in children was associated with receipt of LAIV4, low postvaccination HI titer, and younger age. The risk was highest among children 5-8 years old who had not been previously vaccinated. Larger studies in children are needed to better understand risk of vaccine failure.

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