Influenza Vaccine Effectiveness Among Children 6 to 59 Months of Age During 2 Influenza Seasons

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FROM ABSTRACT:
Objective:
To measure vaccine effectiveness (VE) in preventing influenza-related health care visits among children aged 6 to 59 months during 2 consecutive influenza seasons.

Design:
Case-cohort study estimating effectiveness of inactivated influenza vaccine in preventing inpatient/ outpatient visits (emergency department [ED] and outpatient clinic). We compared vaccination status of laboratory confirmed influenza cases with a cluster sample of children from a random sample of practices in 3 counties during the 2003-2004 and 2004-2005 seasons.

Setting: Counties from Rochester, Nashville, and Cincinnati.

Participants:
Children aged 6 to 59 months seen in inpatient/ED or outpatient clinic settings for acute respiratory illnesses and community-based subcohort comparison.

Main Exposure: Influenza vaccination.

Results:
During the 2003-2004 and 2004-2005 seasons, 165 and 80 inpatient/ED and 74 and 95 outpatient influenza cases were enrolled, while more than 4500 inpatient/ ED and more than 600 outpatient subcohorts were evaluated, respectively.

Significant influenza vaccine effectiveness could not be demonstrated for any season, age, or setting after adjusting for county, sex, insurance, chronic conditions recommended for influenza vaccination, and timing of influenza vaccination (VE estimates ranged from 7%-52% across settings and seasons for fully vaccinated 6- to 59-month-olds).

Conclusion:
In 2 seasons with suboptimal antigenic match between vaccines and circulating strains, we could not demonstrate vaccine effectiveness in preventing influenza-related inpatient/ED or outpatient visits in children younger than 5 years.

THESE AUTHORS ALSO NOTE:

"The US and several other countries have expanded their childhood influenza vaccination recommendations in response to evidence that influenza disease causes substantial morbidity among young children."

In June 2006, the Advisory Committee on Immunization Practices recommended annual influenza vaccination for all children aged 6 to 59 months.

"An inherent assumption of expanded vaccination recommendations is that the vaccine is efficacious in preventing clinical influenza disease."

"Surprisingly little information exists regarding influenza vaccine effectiveness among young children receiving vaccine in routine health care settings."

RESULTS

"No significant vaccine effectiveness in the outpatient setting was observed for any age group for either season."

"Although on bivariate analyses the subcohort had consistently higher vaccination rates than the cases for most age strata, after adjustment for covariates, we could not demonstrate statistically significant vaccine effectiveness for the 6 to 23 month, 24 to 59 month, or the entire 6 to 59 month age groups in either season."

During the 2003-2004 season, only 11% of influenza "A" specimens across the United States were similar to a strain included in the vaccine.

During the 2004-2005 season, only 36% of virus isolates were antigenically similar to vaccine strains.

"It is extremely challenging to predict which influenza strains will circulate and not possible to predict geographic variability in circulating strains."

CONCLUSIONS

"Each year, US children aged 6 to 59 months experience high rates of hospitalizations, ED visits, and outpatient visits due to influenza. Despite this, we were unable across 3 large communities to demonstrate that influenza vaccination was effective in preventing influenza-related inpatient/ED visits or outpatient visits during 2 consecutive seasons (2003-2004 and 2004-2005) among 6- to 23-month-olds, 24- to 59-month-olds, or the entire age span."

KEY POINTS FROM DAN MURPHY

This study measured the effectiveness of the flu vaccine effectiveness in preventing influenza-related health care visits among children aged 6 to 59 months during 2 consecutive influenza seasons, 2003-2004 and 2004-2005.

1) "The US and several other countries have expanded their childhood influenza vaccination recommendations in response to evidence that influenza disease causes substantial morbidity among young children."

2) In June 2006, the Advisory Committee on Immunization Practices recommended annual influenza vaccination for all children aged 6 to 59 months.

3) "An inherent assumption of expanded vaccination recommendations is that the vaccine is efficacious in preventing clinical influenza disease."

4) Significant influenza vaccine effectiveness could not be demonstrated for any season, age, or setting after adjusting for county, sex, insurance, chronic conditions recommended for influenza vaccination, and timing of influenza vaccination.

5) In 2 seasons with suboptimal antigenic match between vaccines and circulating strains, we could not demonstrate vaccine effectiveness in preventing influenza-related inpatient emergency department or outpatient visits in children younger than 5 years.

6) "No significant vaccine effectiveness in the outpatient setting was observed for any age group for either season."

7) "Although on bivariate analyses the subcohort had consistently higher vaccination rates than the cases for most age strata, after adjustment for covariates, we could not demonstrate statistically significant vaccine effectiveness for the 6 to 23 month, 24 to 59 month, or the entire 6 to 59 month age groups in either season."

8) During the 2003-2004 season, only 11% of influenza "A" specimens across the United States were similar to a strain included in the vaccine.

9) During the 2004-2005 season, only 36% of virus isolates were antigenically similar to vaccine strains.

10) "It is extremely challenging to predict which influenza strains will circulate and not possible to predict geographic variability in circulating strains."

11) "Each year, US children aged 6 to 59 months experience high rates of hospitalizations, ED visits, and outpatient visits due to influenza. Despite this, we were unable across 3 large communities to demonstrate that influenza vaccination was effective in preventing influenza-related inpatient/ED visits or outpatient visits during 2 consecutive seasons (2003-2004 and 2004-2005) among 6- to 23-month-olds, 24- to 59-month-olds, or the entire age span."