



Is FluMist Being Underrated?

Commentary by ACPeds Board member, Scott Field, MD, FCP

The last (2017-2018) influenza (flu) season was by most accounts the heaviest season in many years, with CDC reporting the highest severity across all age groups since 2003, including over 183 pediatric flu-associated deaths.¹ It was also the second season in a row after 12 years of widespread use that the live attenuated influenza vaccine (LAIV), known as FluMist, was removed from the market at the advice of the Advisory Committee on Immunization Practices (ACIP) due to evidence of inferior performance after the 2012-2013 season.²

Now, FluMist is available, but the American Academy of Pediatricians (AAP) is recommending that it "...may be used for children who would not otherwise receive an influenza vaccine..." but that the "...inactivated influenza vaccine [IIV or shot]" is the "primary choice for influenza vaccination in children." The reason stated was "...because the effectiveness of a live attenuated influenza vaccine against influenza A(H1N1) was inferior during past influenza seasons and is unknown for this upcoming season."³

Although there was a U.S. study that found no benefit from LAIV in the 2015-2016 season,² that season was relatively light and there was little presence of H₃N₂ strains that are involved in most big epidemics such as the one we just experienced. Furthermore, recently published data from Canada showed comparable effectiveness of LAIV versus IIV against H₁N₁ between 2012 and 2016, and significantly lower odds of infection with influenza B for LAIV recipients.⁴

Most previous studies comparing LAIV with flu shot found the LAIV to be more effective for children, while the shot was generally more effective in adults.^{5,6} In a study looking at pediatric flu deaths and flu vaccine use between 2010 and 2014, the seasons in which the high-risk children (who generally do not get LAIV) had lower vaccine efficacy (38%) were the same seasons in which the non-high-risk group (who were more likely to get LAIV) had higher (63-89%) vaccine efficacy. In the 2013-2014 season, in which LAIV did poorly, the high risk group had higher vaccine efficacy (75%) and the non-high-risk group had lower (48%) vaccine efficacy,⁷ which might implicate LAIV as being more effective in preventing flu deaths in children for most of the studied seasons. The only study I know of to compare efficacy as a function of time after flu vaccination found that IIV efficacy wore off after 4 months as compared to the LAIV.⁸ Not only did the LAIV work better (35-53% less flu illness) than the shot, but it protected longer. That might explain why the Canadian study found better protection against flu B, which tends to present later in the flu season.

While it is true that the effectiveness of LAIV for this coming season is unknown, that is also true of IIV. The shot's effectiveness has truly varied from season to season. It had poor performance in the last previous heavy

flu season (2012-2013) while the LAIV had good performance that season, which is why CDC gave preference to LAIV for the 2013-2014 season.

I still wonder about whether adding a fourth strain to LAIV after the 2012-2013 season adversely affected its performance in the subsequent three seasons, since interference seems plausible with multi-strain live virus vaccines. This next season is likely to be a light season, and LAIV is likely to be underutilized due to official recommendations, so it may be difficult to get good data on comparative effectiveness between the two types of flu vaccines. At least there is a possibility of comparison, unlike the last two seasons. Who knows what the relative effectiveness of the two types of flu vaccines would have been in last winter's record season for severity? Perhaps there would have been less pediatric morbidity and mortality if LAIV had not been taken from the U.S. market.

References:

1. <https://www.cdc.gov/flu/about/season/flu-season-2017-2018.htm>
2. Jackson ML, Chung JR, Jackson LA, et al. Influenza vaccine effectiveness in the United States during the 2015-2016 season. *N Engl J Med* 2017;377(6):534-543.
3. Recommendations for prevention and control of influenza in children 2018-2019. Committee of Infectious Diseases. *Pediatrics* 2018;142(4):doi:10.1542/peds.2018-2367. (Accessed 10/15/2018)
4. Buchan SA, Booth s, Scott AN, et al. Effectiveness of live attenuated versus inactivated influenza vaccines in children during the 2012-2013 through 2015-2016 influenza seasons in Alberta, Canada: a Canadian immunization research network (CIRN) study. *JAMA Pediatr* 2018;172(9):810.
5. Ambrose CS, Levin MJ, Belshe RB. The relative efficacy of trivalent live attenuated and inactivated influenza vaccines in children and adults. *Influenza Other Respir Viruses* 2011;5(2):67-75.
6. Osterhom MT, Kelley NS, Sommer A, Belongia E. Efficacy and effectiveness of influenza vaccines: a systematic review and meta-analysis. *Lancet* 2012;12:36-44.
7. Flannery B, Reynolds SB, Blanton L, et al. Influenza vaccine effectiveness against pediatric deaths: 2010-2014. *Pediatrics* 2017;139(5):
8. Ambrose CS, Wu X, Belshe RB. The efficacy of live attenuated and inactivated influenza vaccines in children as a function of time postvaccination. *Ped Inf Dis J* 2010;29(9):806-811.