

Comparing influenza vaccine efficacy against mismatched and matched strains: a systematic review and meta-analysis

Summary

The TIV and LAIV vaccines can provide cross protection against non-matching circulating strains. The point estimates for VE were different for matching versus non-matching strains, yet the CIs overlapped.

Implications

Our results can help public health officials anticipate the possible infection and complications from influenza during mismatched years. Estimates of protection for mismatched influenza seasons can be used by patients who are contemplating immunization, since the LAIV and TIV have been shown to offer benefit during matched seasons, as well as mismatched seasons.

Reference: Tricco AC, Chit A, Soobiah C, et al. Comparing influenza vaccine efficacy against mismatched and matched strains: a systematic review and meta-analysis. *BMC Med.* 2013 Jun 25;11:153.

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What is the current situation?

- Influenza vaccines are most effective when the antigens in the vaccine match those of circulating strains. However, antigens contained in the vaccines do not always match circulating strains.
- Data on the protective efficacy of unmatched strains, or cross protection, are sparse.
- These data are of particular importance, given that influenza B vaccine strains did not match circulating strains in six influenza seasons between 2000 and 2011 in the USA.

What is the objective?

To examine the vaccine efficacy (VE) afforded by influenza vaccines when they are not well matched to circulating strains.

How was the review conducted?

- Searches were conducted for randomized clinical trials (RCTs) in MEDLINE, Embase and the Cochrane Library.
- RCTs reporting laboratory-confirmed influenza among healthy participants vaccinated with antigens of matching and non-matching influenza strains were included.
- Two independent reviewers screened citations/full-text articles, abstracted data, and appraised risk of bias.
- A random effects meta-analysis was conducted and VE was calculated using the following formula: $(1 - \text{relative risk} \times 100\%)$.

What did the review find?

- 34 RCTs were included, providing data on 47 influenza seasons and 94,821 participants.
- The live-attenuated influenza vaccine (LAIV) showed significant protection against mismatched (6 RCTs, VE 54%, 95% confidence interval (CI) 28% to 71%) and matched (7 RCTs, VE 83%, 95% CI 75% to 88%) influenza strains among children aged 6 to 36 months.
- The results for mismatched influenza A based on 5 RCTs were VE 75%, 95% CI 41% to 90% and mismatched influenza B were (5 RCTs) VE 42%, 95% CI 22% to 56%) among children aged 6 to 36 months.
- The trivalent inactivated vaccine (TIV) afforded significant protection against mismatched (9 RCTs, VE 52%, 95% CI 37% to 63%) and matched (8 RCTs, VE 65%, 95% CI 54% to 73%) influenza strains among adults.
- For mismatched influenza A the results were (five RCTs) VE 64%, 95% CI 23% to 82% and mismatched influenza B were (8 RCTs) VE 52%, 95% CI 19% to 72%) among adults.