Review: Vaccination reduces the incidence of serologically confirmed influenza in healthy adults

Demicheli V, Rivetti D, Deeks JJ, Jefferson TO. **Vaccines for preventing influenza in healthy adults.** Cochrane Database Syst Rev. 2004;(3):CD001269.

QUESTION

Is vaccination effective for reducing the incidence and severity of influenza in healthy persons 14 to 60 years of age?

METHODS

Data sources: Cochrane Central Register of Controlled Trials (Issue 1, 2004), MEDLINE (1966 to 2003), EMBASE/Excerpta Medica (1990 to 2003), bibliographies of relevant articles, and manufacturers and researchers.

Study selection and assessment: Quasi-randomized or randomized controlled trials (RCTs) (published in any language) that evaluated the effectiveness of influenza vaccines for protection from exposure to naturally occurring influenza in healthy persons 14 to 60 years age.

Outcomes: Incidence of clinically defined influenza (CDI) (unspecified or specified on the basis of specific symptoms or signs), serologically confirmed influenza (SCI), adverse effects, and working days lost.

MAIN RESULTS

25 RCTs (n = 59 566) (47 comparisons) met the selection criteria. *For influenza vaccine (inactivated parenteral vaccine [IP], live aerosol vaccine [LA], or inactivated aerosol vaccine [IA]) vs placebo:* Rates of CDI and SCI were lower in the IP group than in the placebo group (Table). Rates of specified CDI and SCI were also lower in the LA group than in the placebo group (Table). The rate of unspecified CDI was lower in the IA group than in the placebo group (Table). IPs were associated with increased rates of local tenderness and soreness (overall relative risk increase [RRI] for local effects 256%, 95% CI 214 to 303), whereas LAs were associated with increased rates of sore throats and coryza (overall RRI 56%, CI 31 to 87). *For at least 1 vaccine recommended for that year vs placebo or other vaccines*: The rate of CDI was lower in the vaccine group (IP, LA, and IA groups combined) than in the placebo groups (relative risk reduction [RRR] 22%, CI 14 to 30) (27 comparisons). The rate of SCI was lower in the combined IP and LA group than in the control group (placebo or noninfluenza vaccine) (RRR 68%, CI 57 to 76) (21 comparisons). The number of working days lost was lower in the IP group than in the control group (weighted mean difference 0.16, CI 0.04 to 0.29) (7 comparisons). *For vaccines matching circulating strains vs placebo or other vaccines:* The rate of CDI was lower in the vaccine group (IP, LA, and IA groups combined) than in the placebo group (RRR 33%, CI 20 to 44) (16 comparisons). Overall, the rate of SCI was lower in the combined vaccine group than in the control group (RRR 75%, CI 62 to 84) (13 comparisons).

CONCLUSION

In healthy persons 14 to 60 years of age, vaccines reduce the incidence of serologically confirmed influenza.

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Influenza vaccines (inactivated parenteral vaccine [IP], live aerosol vaccine [LA], or inactivated aerosol vaccine [IA]) vs placebo for preventing influenza in healthy persons 14 to 60 years of age at mean 87 days*

Outcomes	Number of comparisons (n)	Comparisons	Weighted event rates	RRR (95% CI)†	NNT (CI)
CDI unspecified	8 (6566)	IP vs placebo	17% vs 21%	31% (5 to 51)	25 (13 to ∞)
	2 (438)	IA vs placebo	7% vs 20%	65% (32 to 82)	8 (4 to 50)
CDI specified	10 (4271)	IP vs placebo	36% vs 44%	22% (9 to 33)	12 (7 to 34)
	2 (4591)	LA vs placebo	20% vs 23%	15% (5 to 24)	34 (17 to 100)
	2 (1069)	IA vs placebo	20% vs 28%	27% (0 to 47)	17 (7 to ∞)
SCI	9 (2411)	IP vs placebo	2% vs 8%	67% (51 to 78)	17 (13 to 34)
	2 (427)	LA vs placebo	0.5% vs 8.5%	79% (44 to 92)	13 (6 to ∞)

*CDI = clinically defined influenza; SCI = serologically confirmed influenza. Other abbreviations defined in Glossary; weighted event rates, NNT, and CI calculated from data in article using a random-effects model.
†RRR is referred to as vaccine efficacy in the Cochrane review.

COMMENTARY

Influenza is a complicated public health problem. Both the antigenic makeup of the virus and the number of new cases can vary greatly from year to year, and the demand for the vaccine is also unpredictable. In a bad year, influenza can cause thousands of excess deaths in susceptible patients. The 2004 to 2005 season has been particularly complicated because a major manufacturer failed to meet safety standards, greatly reducing the availability of vaccine early in the season, and the recommendations have been expanded (1).

The Cochrane review by Demicheli and colleagues confirms the effectiveness of both the widely used IP vaccine and the recently approved LA vaccine for reducing the incidence of SCI in healthy persons 14 to 60 years of age. However, vaccination is not currently recommended for most of this population (only those > 50 y of age, or those who live with or care for persons at high risk) (1). The LA vaccine is only approved for those between 5 and 49 years of age and is not recommended for health care workers who are continually exposed to high-risk patients because of concerns about transmission of the live vaccine virus (1).

So, what does this review add? It confirms that vaccination can have direct benefit with little toxicity in all age groups, and supports recent suggestions that vaccine policy should be broadened to include the entire community (2). Thus, physicians who struggle to keep up with the changing recommendations should feel comfortable erring on the side of commission, rather than omission: If you offer vaccination to everyone who comes through your doors, you will do little if any harm, and you may save lives.

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References

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2. **Griffiths PD.** Rev Med Virol. 2004;14:137-9.