Protective effect of influenza vaccination on cardiovascular diseases: A systematic review and meta-analysis

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Abstract

Cardiovascular diseases (CVDs) are among the leading causes of mortality and morbidity worldwide. There are many contrasting ideas on the effectiveness of influenza vaccination on CVDs. This study aimed to investigate the association between influenza vaccination and the risk of CVDs. We systematically searched all PubMed/Medline, EMBASE, and the Cochrane library entries up to November 2019 for studies of influenza vs. the CVDs outcomes. We conducted a random-effects meta-analysis using the inverse variance method for pooled risk ratios (RR) or odds ratios (OR) and evaluated statistical heterogeneity using the I^2 statistic. We identified 17 studies (6 randomized controlled trial [RCT], 5 cohorts, and 6 case–control) with a total of 180,043 cases and 276,898 control participants. The pooled RR of developing CVDs after influenza vaccination in RCT studies was 0.55 (95% CI 0.41–0.73), which was significant (P-value = 0.00). The pooled OR of decreasing CVDs after influenza vaccination in cohort studies was 0.89 (95% CI 0.77–1.04). The pooled OR of developing CVDs after influenza vaccination by pooling case–control studies was 0.70 (95% CI 0.57–0.86, (P-value = 0.00). All of these studies suggest decreased risks of CVDs with influenza vaccination. The current study does support the protective role of influenza vaccination on CVDs events. Health authorities may develop evidence-based preventive strategies to offer influenza vaccination in patients with CVDs.

Table

Type of study	Number of studies	Pooled RR or OR (95% CI)	P-value	Heterogeneity Test		Publication bias (p-value)
				I^2	P-value	
RCT	6	0.55 (0.41-0.73)	0.00	50	0.06	1.00
Cohort	5	0.89 (0.77-1.04)	0.15	88	0.00	0.80
Case–control	6	0.70 (0.57-0.86)	0.00	98	0.00	1.00

Pooled RR or OR for included studies.

Recent Publications

1. Chiang, M. H. *et al.* Association between influenza vaccination and reduced risks of major adverse cardiovascular events in elderly patients. *Am.* Heart J. 193, 1–7.
2. Christiansen, C. F., Thomsen, R. W., Schmidt, M., Pedersen, L. & Sorensen, H. T. Influenza vaccination and 1-year risk of myocardial infarction, stroke, heart failure, pneumonia, and mortality among intensive care unit survivors aged 65 years or older: a nationwide population-based cohort study. Intensive Care Med. 45, 957–967.
3. Loeb, M. et al. Randomized controlled trial of influenza vaccine in patients with heart failure to reduce adverse vascular events (IVVE): Rationale and design. Am. Heart J. 212, 36–44.
4. Smetana, J., Chlibek, R., Shaw, J., Splino, M. & Prymula, R. Influenza vaccination in the elderly. Hum. Vaccin. Immunother 14, 540–549.
5. Macintyre, C. R. et al. Ischaemic heart disease, influenza and influenza vaccination: a prospective case control study.
6. Gurfinkel, E. P. & de la Fuente, R. L. Two-year follow-up of the FLU vaccination acute coronary syndromes (FLUVACS) registry. Tex. Heart Inst. J. 31, 28–32.
7. Wu, H. H., Chang, Y. Y., Kuo, S. C. & Chen, Y. T. Influenza vaccination and secondary prevention of cardiovascular disease among Taiwanese elders—a propensity score-matched follow-up study. PLoS ONE 14, 1.



Biography

I am a medical intern and student in master of medical education, graduated from MPH. my research interests are in the fields of internal medicine, infectious disease and public health. My interested research design is systematic reviews and meta-analysis because of its importance in the evidence based medicine and preparing medical guidelines, so I earned a certification from John Hopkins University for doing this type of searching. Now I am working on COVID-19 pandemic and its effect on our lives.

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