SYNOPSIS
05/28/2020

Review of “Influenza vaccine does not increase the risk of coronavirus or other non-influenza respiratory viruses: retrospective analysis from Canada, 2010-11 to 2016-17”


One-Minute Summary

- This study addresses the speculation that influenza vaccination may increase the risk of Coronavirus Disease 2019 (COVID-19) by examining the relationship between influenza vaccination and the risk of non-influenza respiratory viruses (NIRV), including seasonal coronaviruses, in Canada from the 2010-11 season through the 2016-17 season.
- During the study, there were 4,281 influenza, 2,565 NIRV and 3,841 pan-negative specimens (negative for influenza and NIRV) and 175 co-infections. The median age was similar for influenza, coronavirus and combined NIRV cases or test-negative controls (34-37 years).
- Among NIRV detections (n=2,565), the most common was enterovirus/rhinovirus (25.1%), followed by coronavirus (22.2%), respiratory syncytial virus (20.4%), human metapneumovirus (15.2%), parainfluenza (12.3%), adenovirus (4.4%) and bocavirus (0.2%).
- Impact of influenza vaccine on influenza cases:
  - The adjusted odds ratio (aOR) for influenza vaccination among influenza cases when compared to test-negative controls was 0.55 (95% confidence interval [CI]: 0.50-0.61) and similar when compared to pan-negative controls (aOR = 0.58, 95% CI: 0.52-0.65) or NIRV-positive controls (aOR = 0.51, 95% CI: 0.45-0.58).
  - Influenza vaccine effect against influenza did not differ between children (<20-years-old) (aOR = 0.56, 95% CI: 0.44-0.70) and adults (≥20-years-old) (aOR = 0.55, 95% CI: 0.49-0.61).
- Impact of influenza vaccine on coronavirus cases:
  - The aOR for influenza vaccination among coronavirus cases compared to coronavirus test-negative controls was 1.04 (95% CI: 0.85-1.28) and similar when compared to pan-negative controls (aOR = 1.09, 95% CI: 0.89-1.34) or NIRV-positive controls (aOR = 0.98, 95% CI: 0.79-1.22).
  - Influenza vaccine effect against coronavirus did not differ between children (aOR = 0.74, 95% CI: 0.42-1.32) and adult (aOR = 1.11, 95% CI: 0.89-1.38).
  - The influenza vaccine reduced risk of influenza by >40% while having no impact on the risk of infection from NIRV or seasonal coronavirus.
Additional Information

- The authors used datasets from the Canadian Sentinel Practitioner Surveillance Network (SPSN) to assess the association between influenza vaccine and NIRV risk, using a test-negative design (TND) analysis.
- Study participants included: 1) patients tested for influenza and NIRV; 2) patients from Alberta, British Columbia, Ontario or Quebec; 3) specimens collected from November through April; 4) patients ≥ 1 year old; and 5) patients who presented within 7 days of influenza like illness (i.e., fever and cough plus ≥ 1 of arthralgia, myalgia, prostration or sore throat) symptom onset.
- Among coronavirus detections (n=570), the most common was OC43 (40.4%), followed by NL63 (19.6%), 229E (15.4%), 229E/NL63 combined targets (14.2%), HKU1 (9.3%) and coronavirus co-infections (1.1%).
- The authors note that “valid TND estimates require that etiologies against which [the] vaccine is effective are specifically excluded from the test-negative control group and this applies also when exploring vaccine effects on non-vaccine target pathogens”. Additionally, they highlight the implications of this methodological issue for further examination of influenza vaccine effects against COVID-19.
- This conclusion and additional analyses performed in this study, refute the findings by Wolff (2020) that indicated influenza vaccination increases the risk of seasonal coronavirus. The authors emphasize that addressing such speculation is important to maintain influenza vaccine coverage through the ongoing COVID-19 pandemic.

PHO Reviewer's Comments

- None

Citation

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Review of “Influenza vaccine does not increase the risk of coronavirus or other non-influenza respiratory viruses: retrospective analysis from Canada, 2010-11 to 2016-17”. Toronto, ON: Queen’s Printer for Ontario; 2020.

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