VII – 6

Evidence of virus interference? Increased risk of non-influenza respiratory virus infections associated with receipt of inactivated influenza vaccine

Authors: Benjamin J. Cowling[1], Vicky J. Fang[1], Hiroshi Nishiura[1], Kwok-Hung Chan[2], Sophia Ng[1], Dennis K. M. Ip[1], Susan S. Chiu[3], Gabriel M. Leung[1], J. S. Malik Peiris[1,4]

Affiliations:
1. Infectious Disease Epidemiology Group, School of Public Health, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Pokfulam, Hong Kong.
2. Department of Microbiology, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Pokfulam, Hong Kong.
3. Department of Pediatrics and Adolescent Medicine, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Pokfulam, Hong Kong Special Administrative Region, China.
4. Centre for Influenza Research, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Pokfulam, Hong Kong.

Background:
Seasonal influenza vaccination is effective in preventing influenza infection and disease in healthy school-age children, while influenza vaccination is not generally thought to affect the risk of non-influenza respiratory virus infections (e.g. the common cold). Interference between respiratory virus epidemics has been reported in a series of ecologic studies, and it has been hypothesized that this phenomenon is associated with temporary non-specific immunity following a respiratory viral infection.

Methods:
In November-December 2008, we conducted a randomized controlled trial and administered 2008-09 seasonal trivalent inactivated influenza vaccine (TIV) or placebo to one child aged 6-15 years in each of 115 households. Subjects were followed up for approximately 9 months with four serum draws, and report of acute respiratory illness in any household member triggered home visits for collection of pooled nose and throat swabs from all household members regardless of illness. Swabs were tested to confirm infections with 19 respiratory viruses by the ResPlex II Plus multiplex RT-PCR array, and with influenza A and B by RT-PCR.

Results:
We identified 134 episodes of acute respiratory illness with no statistically significant difference in incidence rates between recipients of TIV and placebo. Compared to placebo recipients, there was a statistically significant increased risk of confirmed non-influenza respiratory virus infections among TIV recipients (relative risk: 4.40; 95% CI: 1.31, 14.8), which appeared to be associated with an increased risk of rhinovirus and coxsackie/echovirus infections in March 2009, shortly after the winter influenza season in February 2009.

Conclusions:
Although they were protected against influenza, TIV recipients appeared to face a higher risk of non-influenza respiratory virus infections. One potential explanation is temporary non-specific immunity, a phenomenon that remains to be fully characterized.