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Under the weather: acute myocardial infarction and subsequent case fatality with influenza burden - a nationwide observational study

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Background: Influenza may precipitate cardiovascular disease but influenza typically peaks in winter coinciding with other triggers of myocardial infarction (MI) such as low air temperature, high wind velocity, low air pressure and short sunshine duration. We aimed to study week-to-week variation in influenza cases and acute MI after meteorological confounder adjustment in a nationwide setting.

Methods: Weekly laboratory-confirmed influenza case reports were obtained from the Public Health Agency of Sweden from 2009 to 2016 and merged with the nationwide SWEDEHEART MI registry. Weekly counts of MI were studied with regard to influenza cases stratified into tertiles, 0–16, 17–164 and ≥164 influenza cases/week. Incidence rate ratios were calculated for each category and compared to a reference period of the year with no influenza. A negative binomial regression model was applied to adjust for weather parameters.

Results: A total of 133,562 MIs were reported to the registry during the study period of which 44,055 were ST-elevation MIs. Weeks with influenza cases were associated with higher risk of MI. For 0–16 influenza cases/week the unadjusted incidence rate ratio (IRR) for MI was 1.04 (95% confidence interval [CI] 1.01–1.07, p=0.007); for 17–163 cases/week the IRR=1.07 (95% CI 1.04–1.10, p≤0.001) and for ≥164 cases/week the IRR=1.08 (95% CI 1.05–1.11, p≤0.001). Results were consistent across a large range of subgroups and after adjusting for confounders. In addition, all-cause mortality was higher in weeks with highest reported rates of influenza cases.

Conclusion: In this nationwide observational study, we found an association between occurrence of MI and number of influenza cases beyond what could be explained by meteorological factors.