

Effectiveness of antibiotic prophylaxis in close contacts of invasive group A streptococci infection

Summary

- Close contacts of patients with invasive GAS (iGAS) infection are at an increased risk of also contracting GAS
- We aimed to determine if antibiotic prophylaxis reduces this risk, and to establish unintended harms
- We looked at two cohorts: MarketScan Commercial and Medicare databases from the United States and the Quebec Pregnancy Cohort
- Both cohorts provide longitudinal information on inpatient and outpatient medical services
- In QPC, we identified 67 index cases (probable iGAS) and 117 close contacts. 29.9% of close contacts received antibiotic prophylaxis; there were no subsequent GAS cases in either group
- In the MarketScan databases, a trend for lower risk of GAS after antibiotic prophylaxis did not reach statistical significance, but a clear 3-fold increase in potential adverse drug events was seen in the prophylaxis group.

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What is the current situation?

Streptococcus pyogenes (group A streptococci, GAS) causes syndromes ranging from localized illness to invasive and severe disease. Invasive GAS (iGAS) infection causes significant morbidity and mortality, and the risk of contracting GAS infection is higher among close contacts of iGAS index cases. The Public Health Agency of Canada (PHAC) recommends the use of antibiotic prophylaxis among close contacts of iGAS, but a recent study did not find sufficient evidence to support this practice.

What was the aim of the study?

- To determine if antibiotic prophylaxis is effective at preventing subsequent GAS infection in persons exposed to iGAS cases.
- To determine if the benefit outweighs the risk of unintended harm (adverse drug events).

How was the study conducted?

- In MarketScan Commercial and Medicare databases (2010-2019) and the Quebec Pregnancy Cohort (QPC, 1998-2021), we studied the effectiveness of antibiotic prophylaxis in close contacts of confirmed or probable iGAS cases.
- MarketScan databases provide longitudinal data on inpatient/outpatient medical services, with identifiers that link family members on the same insurance plan.
- The QPC is a prospective cohort of all pregnancies of women covered by the Public Prescription Drug Insurance in Quebec. The QPC provides longitudinal information for mothers and their children on inpatient and outpatient medical services.
- In both databases, antibiotic treatment was considered prophylactic if initiated in close contacts within 7 days after the iGAS diagnosis in the index case, while subsequent cases were defined as the occurrence of GAS infection among close contacts within 30 days of the iGAS diagnosis of the index case.
- Unintended harms in those receiving prophylaxis included the occurrence of any adverse reaction to antibiotics within 30 days of the index case date.

What did the study find?

- In QPC, we found 67 index cases of probable iGAS infection and 117 close contacts
 - In close contacts, 29.9% (35/117) were exposed to antibiotic prophylaxis.
 - No subsequent cases of GAS infection were identified among close contacts
- In the MarketScan database there were 17,078 index cases and 21,032 close contacts.
 - 4.4% of close contacts were exposed to antibiotic prophylaxis
 - 25 subsequent cases of GAS infection were identified among close contacts
 - Secondary attack rates were 13.2 (95% CI 1.9-93.7) and 14.8 (95% CI 9.9-22.1) per 1,000 person-year in subjects exposed and unexposed to antibiotic prophylaxis
 - In multivariate analyses, we observed a slight trend towards lower risk of GAS infection with antibiotic prophylaxis versus the unexposed group, though not statistically significant (OR 0.88; 95% CI 0.12-6.51; model adjusted for sex, age, comorbidity, steroid use, and recent past infection).
 - The incidence of potential adverse drug events was 39.6/100 person-years (95% CI 27.7-56.6) among those receiving antibiotic prophylaxis and 10.6/100 person-years (95% CI 9.1-12.3) among those not receiving antibiotic prophylaxis.

In summary, our study was unable to demonstrate real-world effectiveness for antibiotic prophylaxis to prevent GAS infection in close contacts of iGAS cases. We did note a clear 3-fold increase in potential adverse drug events in the antibiotic prophylaxis group.

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