

## OBSERVATIONS

## Adults With Diabetes Hospitalized With Pandemic Influenza A(H1N1)pdm09—U.S. 2009

In the U.S., diabetes was common among adults hospitalized with pandemic influenza A(H1N1)pdm09 virus (pH1N1) infection, with a prevalence of 15–25% in national case series (1–3). Despite the influenza burden among patients with diabetes, clinical data are limited.

Through two U.S. pH1N1 hospitalizations case series conducted during the spring and fall of 2009 (1,2), medical records of adults  $\geq 18$  years old hospitalized with laboratory-confirmed pH1N1 infection were reviewed. Data were collected as part of public health emergency response and deemed not to be research. We compared clinical features between patients with and without diabetes and performed a Mantel-Haenszel analysis, controlling for obesity (BMI  $\geq 30$  kg/m<sup>2</sup>).

Among 319 adults hospitalized with pH1N1 infection, 72 (23%) had diabetes, including 33 of 169 patients (20%) in the spring and 39 of 150 patients (26%) in the fall of 2009. Patients with diabetes were more likely than those without diabetes to be obese (79 vs. 46%,  $P < 0.01$ ), to be older (median age 49 vs. 38 years,  $P < 0.01$ ), and to have cardiovascular disease (32 vs. 18%, Mantel-Haenszel odds ratio 2.2 [95% CI 1.1–4.6]); there were no differences in clinical presentation or median length of stay (4 days). Similar proportions of patients with and without diabetes were admitted  $\leq 2$  days of symptom onset (39 vs. 40%). Patients with diabetes were not more likely than patients without diabetes to have pneumonia (37 vs. 47%, 0.6 [0.3–1.2]), sepsis (12 vs. 12%, 1.0 [0.4–2.9]), or acute respiratory distress syndrome (12 vs. 16%, 0.6 [0.2–1.5]). There were no significant differences in receipt of influenza antiviral agents between the two groups (84 vs. 76%, 1.5

[0.7–3.4]), including  $\leq 2$  days of symptom onset (32 vs. 37%, 0.8 [0.4–1.6]) and  $\leq 2$  days of admission (83 vs. 89%, 0.6 [0.2–1.6]). Patients with diabetes were less likely to require intensive care unit admission than those without diabetes (25 vs. 42%, 0.4 [0.2–0.9]); there was no significant difference in frequency of death (9 vs. 11%, 0.7 [0.2–2.0]).

Although diabetes prevalence in the present pH1N1 hospitalization case series was twice that of the general U.S. population (23 vs. 11%) (4), diabetes was not associated with severe outcomes after controlling for obesity. It is possible that patients with diabetes may have been more readily admitted as a precaution regardless of illness severity on presentation because these patients are a known high-risk group for influenza-associated complications (5). The present data are limited because information on glycemic control, which could have affected outcomes, was not available. To our knowledge, no studies have compared patients with and without diabetes hospitalized for seasonal influenza infection or explored the potential differences in impact between seasonal and pH1N1 influenza in patients with diabetes; further study in these areas is warranted.

Although the majority of patients received influenza antiviral agents, only one-third of patients with diabetes received antiviral agents  $\leq 2$  days of symptom onset. Delayed presentation may have contributed, but early empiric influenza antiviral treatment is an important adjunct to vaccination and should be started as early as possible in patients with diabetes with suspected influenza infection, regardless of illness severity (5).

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