**1511. Influenza antiviral use in patients hospitalized with laboratory-confirmed influenza in the United States, FluSurv-NET, 2015 – 2019**

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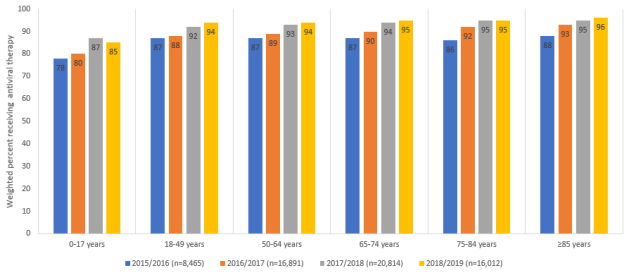
**Session:** P-68. Respiratory Infections - Viral

***Background.*** Antiviral therapy is recommended for all patients hospitalized with influenza to reduce morbidity and mortality. We used data from the population-based Influenza Hospitalization Surveillance Network (FluSurv-NET) to evaluate trends in influenza antiviral use in patients hospitalized with influenza over 4 seasons in the United States.

***Methods.*** We included cases residing within the FluSurv-NET catchment area and hospitalized with laboratory-confirmed influenza from October 1 – April 30 during 2015-16 through 2018-19 seasons. For 2015-16 and 2016-17, chart abstraction of demographic and clinical characteristics and antiviral use was performed on all cases; for 2017-18 and 2018-19, all patients < 50-years and an age-stratified random sample of older adults were sampled. Data were weighted to reflect the probability of selection. We assessed the frequency of treatment, by season and age group, and evaluated trends by season using the Cochran-Armitage test. Among those receiving antivirals, we used multivariable logistic regression to assess the association between the days from symptom onset to admission and receipt of early (0-2 days from symptom onset) versus late (> 2 days) treatment, adjusting for age, sex, race/ethnicity, and underlying medical conditions.

***Results.*** Over 4 seasons, we sampled 62,182 patients; 54% female and 63% non-Hispanic white. Overall, 92% of patients received antivirals, increasing from 86% in 2015-16 to 94% in 2018-19; use increased by season in all age strata ($p < 0.001$) [Figure]. Most received oseltamivir (99%); in 2018-19, 2% received baloxavir. Of those who received antivirals, 38% received early treatment. The median days from symptom onset to admission was 1 day (interquartile range [IQR] 1-3) for those who received early treatment and 4 days (IQR 3-6) for those who received late treatment. Ninety-three percent who received antivirals started within 1 day of admission. For each additional day from symptom onset to admission, the adjusted odds of late treatment was 8.56 (95% confidence interval: 7.83-9.35).

Figure. Weighted percentage of hospitalized patients receiving influenza antivirals by influenza season and age strata, FluSurv-NET, 2015-16 through 2018-19.




***Conclusion:*** In patients hospitalized with influenza, most received antiviral treatment within 1 day of admission. However, a majority had delays from symptoms onset to initiation, due to late presentation of illness.

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**1512. Influenza vaccine effectiveness wanes over the influenza season: results from five military treatment facilities**

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**Session:** P-68. Respiratory Infections - Viral

***Background.*** Influenza vaccination can reduce influenza burden, but questions have arisen about the duration of vaccine protection. While the timing of vaccination varies, annual receipt of influenza vaccine is mandated for active duty military personnel. The goal of this analysis is to determine if influenza vaccine effectiveness decreases over time. A secondary goal of this analysis is to determine if repeated influenza vaccination is associated with risk for influenza.

***Methods.*** Otherwise healthy individuals presenting for treatment of acute respiratory infections at 5 military treatment facilities from 2009 to 2018 were enrolled in the Acute Respiratory Infection Consortium (ARIC) study. Individuals with complete demographics, influenza vaccination in the two years prior to illness, and influenza laboratory results were included in this analysis (n=1,273). Multivariate logistic regression was used to calculate the odds of an influenza diagnosis according to time since influenza vaccination, categorized in 90-day periods. The model also included age, race, month of diagnosis, influenza season, and whether the participant received 4+ influenza vaccinations in the past 5 years.

***Results.*** One hundred and ninety-two individuals (15%) had laboratory confirmed influenza (Table 1). Participants were mostly active duty, male, and white. Over half of the participants received 4+ influenza vaccinations in the past 5 years. Participants who were vaccinated 90-179 and 180+ days ago had greater odds of being diagnosed with influenza than did individuals who were vaccinated < 90 days prior to illness onset (Table 2). Participants who were 18-24 years old had lower odds of influenza than individuals in other age groups. Vaccine experience (vaccinated against influenza for at least four of the past five years), race, and ethnicity were not statistically significantly associated with influenza diagnosis.

Table 1. Characteristics of individuals included in the analysis of waning influenza vaccine effectiveness in the ARIC study

| Variable | Description | N | Influenza B # (%) | Influenza A # (%) | Influenza all # (%) |
|---|---|---|---|---|---|
| Participants (n) | | 1273 | 32 | 160 | 192 |
| Age group*,^,+ | <18 | 186 | 14 (44) | 17 (11) | 31 (16) |
| | 18-24 | 471 | 5 (16) | 29 (18) | 34 (18) |
| | 25-34 | 386 | 2 (6) | 65 (41) | 67 (35) |
| | 35+ | 230 | 11 (34) | 49 (31) | 60 (31) |
| Sex | Men | 767 | 21 (66) | 93 (58) | 114 (59) |
| | Women | 506 | 11 (34) | 67 (42) | 78 (41) |
| Race | Black | 188 | 3 (9) | 33 (21) | 36 (19) |
| | Hispanic | 272 | 10 (31) | 32 (20) | 42 (22) |
| | Unknown/Other | 140 | 4 (13) | 16 (10) | 20 (10) |
| | White | 673 | 15 (47) | 79 (49) | 94 (49) |
| Military status | Active duty | 966 | 10 (31) | 111 (69) | 121 (63) |
| | Dependent | 277 | 16 (50) | 41 (26) | 57 (30) |
| | Retired | 30 | 6 (19) | 8 (5) | 14 (7) |
| Season*,^,+ | 2009/10 | 26 | 0 (0) | 1 (1) | 1 (1) |
| | 2010/11 | 338 | 13 (41) | 30 (19) | 43 (22) |
| | 2011/12 | 201 | 3 (9) | 16 (10) | 19 (10) |
| | 2012/13 | 121 | 8 (25) | 41 (26) | 49 (26) |
| | 2013/14 | 150 | 4 (13) | 32 (20) | 36 (19) |
| | 2014/15 | 38 | 1 (3) | 7 (4) | 8 (4) |
| | 2016/17 | 199 | 1 (3) | 13 (8) | 14 (7) |
| | 2017/18 | 200 | 2 (6) | 20 (13) | 22 (11) |
| Education^,+ | High school | 730 | 14 (44) | 71 (44) | 85 (44) |
| | Associate's degree | 285 | 7 (22) | 40 (25) | 47 (24) |
| | Bachelor's degree+ | 258 | 11 (34) | 49 (31) | 60 (31) |
| BMI>30*,^,+ | Not obese | 912 | 14 (44) | 97 (61) | 111 (58) |
| | Obese | 206 | 8 (25) | 41 (26) | 49 (26) |
| | Missing | 155 | 10 (31) | 22 (14) | 32 (17) |
| Days since influenza vaccination^,+ | <90 | 313 | 9 (2) | 19 (6) | 27 (9) |
| | 90-179 | 614 | 12 (2) | 96 (16) | 108 (18) |
| | 180+ | 346 | 12 (3) | 45 (13) | 57 (16) |
| # of last 5 years vaccinated^,+ | 1 | 312 | 7 (22) | 23 (14) | 30 (16) |
| | 2 | 151 | 4 (13) | 15 (9) | 19 (10) |
| | 3 | 129 | 5 (16) | 13 (8) | 18 (9) |
| | 4 | 105 | 2 (6) | 21 (13) | 23 (12) |
| | 5 | 576 | 14 (44) | 88 (55) | 102 (53) |

*B, ^A, +Any influenza - characteristic statistically significantly different using chi-squared test

Table 2. Multivariate logistic regression results from model using influenza diagnosis as the outcome variable. Also included in the model are season and month of diagnosis.

| | Any influenza | Influenza A | Influenza B |
|---|---|---|---|
| Vaccinated <90 days ago | Ref | Ref | Ref |
| Vaccinated 90-179 days ago | 2.2 (1.3, 3.7) | 2.4 (1.4, 4.4) | 1.1 (0.4, 3.4) |
| Vaccinated 180+ days ago | 3.3 (1.9, 6.0) | 4.1 (2.1, 8.2) | 1.2 (0.4, 3.5) |
| Active duty | Ref | Ref | Ref |
| Dependent | 1.6 (0.8, 2.8) | 1.5 (0.8, 2.7) | 1.3 (0.2, 5.7) |
| Retired | 4.0 (1.6, 10.2) | 1.5 (0.5, 4.0) | 12.2 (2.8, 56.3) |
| Age <18 | 2.1 (0.9, 4.8) | 1.3 (0.5, 3.3) | 4.9 (0.9, 46.0) |
| Age 18-24 | Ref | Ref | Ref |
| Age 25-34 | 1.9 (1.2, 3.2) | 2.3 (1.4, 4.0) | 0.3 (0.0, 1.6) |
| Age 35+ | 3.3 (1.9, 6.0) | 3.5 (1.9, 6.5) | 1.9 (0.5, 8.3) |
| Vaccinated 4+ times in last 5y | 1.3 (0.8, 1.9) | 1.3 (0.8, 2.0) | 1.2 (0.5, 3.1) |
| Race: Black | Ref | Ref | Ref |
| Race: Hispanic | 1.1 (0.7, 1.9) | 1.3 (0.8, 2.1) | 0.5 (0.1, 1.7) |
| Race: Unknown/other | 1.0 (0.7, 1.6) | 0.9 (0.6, 1.5) | 1.6 (0.6, 4.0) |
| Race: White | 1.0 (0.6, 1.8) | 1.0 (0.5, 1.8) | 1.3 (0.3, 4.0) |