

Preliminary summary on oseltamivir-resistant H1N1 virus: Norway

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Over the 2007-2008 influenza season in the northern hemisphere, a total of 262 influenza A(H1N1) viruses were tested for oseltamivir resistance (H274Y) in Norway as at the end of April 2008, of which 175 (66.8%) were found to be resistant. Data collection and analysis is ongoing and the information presented in this summary should be considered as preliminary and interpreted with caution.

Table 1: Data by month of specimen collection

Month of sampling	Nov 07	Dec 07	Jan 08	Feb 08	Mar 08	Apr 08	Total
No. of H1N1 isolates tested	6	19	92	107	36	2	262
No. (%) of viruses resistant to oseltamivir	4 (67%)	16 (84%)	55 (60%)	75 (70%)	23 (64%)	2 (100%)	175 (67%)

Specimen collection sites:

For 226 viruses of known hospitalization status, 190 are from outpatient clinics (84.1%; both sentinel clinics and non-sentinel ones), and 36 are from hospitalized patients (15.9%). The proportions of resistant viruses were similar, in the 60-70% range, for both hospitalized and non-hospitalized patients ($p=0.39$ with chi square test).

Geographical distribution:

The prevalence of oseltamivir resistance has been consistently higher in an area which comprises 6 counties in the southernmost part of Norway (approx 28% of total population), from where 90% ($n=21$) of tested viruses from this area have been determined to be resistant. For other areas of Norway, average resistance prevalence was 64.7%. ($p=0.018$ with chi square test)

Demography:

Specimens have been collected from both adults and children. The lowest prevalence of resistant virus (approx. 55%) is seen in the 5-14 year age group and the highest (approx. 75%) in the 25-59 year age group, but resistance prevalence was high in all age groups.

Oseltamivir use:

Generally, oseltamivir use before specimen collection in persons with resistant virus or in their prior contacts has been very uncommon. None of the 208 patients for which we have data both on resistance profile and antiviral use had received antivirals before sampling; 7 patients received antiviral treatment subsequent to sampling.

Vaccination history:

Among 198 patients with known recent vaccination history, 2 (1.4 %) of 135 patients with resistant virus infection had recent influenza vaccination compared to none of 63 patients with susceptible virus.

Clinical features:

Thus far, no important differences in severity and clinical features between patients infected by resistant and susceptible viruses have been observed. Further studies are in progress, but

hospitalization and serious clinical manifestations have been noted in cases with both oseltamivir resistant and susceptible A(H1N1) virus infection; however, no deaths have been recorded.

Special underlying conditions:

Among 205 patients whose medical history was available, 16 (13 %) of 123 patients with resistant virus infection had underlying chronic medical conditions (e.g., immunodeficiency, diabetes, immunosuppressive therapy, malignancy, other chronic conditions), while 6 (10 %) of 60 patients with susceptible virus infection had such conditions. (OR 1.4, 95%CI 0.5-4.4)

Other findings:

Apart from the occurrence of resistant viruses, the A(H1N1) associated outbreak this winter was of modest proportions in Norway, as seen previously for this subtype. One notable difference compared to A(H1N1) infections in previous seasons is that the adult population seems to have been more affected than usual for A(H1N1) outbreaks. Antigenically, the resistant and susceptible viruses were similar, and they were also related to A(H1N1) viruses that circulated sporadically in Norway during the 2006/2007 season.

Summary provided by:

The Influenza A(H1N1) Oseltamivir Resistance Investigation Team:

Siri H. Hauge, Katrine Borgen, Department of Infectious Disease Epidemiology;
Susanne G. Dudman, Olav Hungnes, National Influenza Centre, Department of Virology;
Division of Infectious Disease Control, Norwegian Institute of Public Health