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Susceptibility of avian influenza viruses to neuraminidase inhibitors

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Background and objectives: Influenza type A viruses (FluA) occur naturally among wild aquatic birds and lead sporadically to outbreaks in poultry farms. Due to their pandemic potential, transmissions of such viruses to humans are an ongoing cause of concern. Neuraminidase inhibitors (NAI) are globally used for prophylaxis and treatment of influenza infections. The study focused on the susceptibility of FluA to the four NAI oseltamivir, zanamivir, peramivir, and laninamivir currently available commercially.

Materials and methods: Susceptibility of FluA to NAI was tested by using a validated fluorometric NA inhibition assay. FluA were selected to represent NA group-1 (NA-subtype N1, N4, N5, N8), and group-2 (NA-subtype N2, N3, N6, N7, N9) viruses as well as viruses of low and high pathogenicity (hemagglutinin-subtypes H5 and H7).

Results: All tested FluA showed *in vitro* susceptibility to the NAI tested. NAs belonging to group-1 were more sensitive to zanamivir than to oseltamivir, whereas group-2 NAs were more sensitive to oseltamivir than to zanamivir. Laninamivir inhibited FluA more efficiently than oseltamivir and zanamivir and even oseltamivir-resistant viruses. Peramivir was the most potent *in vitro* inhibitor of all tested FluA.

Conclusion: Although the tested NAs were sensitive to NAI the potential evolution of antiviral-resistant FluA should be closely monitored. This is even more important in the case of human infections with viruses from animal sources.