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LETTER TO THE EDITOR

INFLUENZA VIRUS SURVEILLANCE BY THE INSTITUTO ADOLFO LUTZ, INFLUENZA SEASON 2014: ANTIVIRAL RESISTANCE

São Paulo, August 4, 2014

Dear Sir,

Neuraminidase (NA) inhibitors (NAIs) are the only antivirals that are effective for prophylaxis and the treatment of seasonal influenza A and B infections. There are currently two NAIs approved in most countries: oseltamivir (Tamiflu; F. Hoffmann - La Roche) and zanamivir (Relenza; GlaxoSmithKline plc.). The development of drug resistance is a major drawback for any antiviral therapy, and these specific anti-influenza drugs are not excluded from this rule. Thus, the proper use of NAIs and worldwide monitoring for the presence and spread of drug resistant influenza viruses are of the utmost importance. The existence of a global surveillance network for influenza, underpinning vaccine strain selection, is a valuable asset when seeking to track the emergence of antiviral resistance.

The Instituto Adolfo Lutz, São Paulo, SP, Brazil, plays a role in national and global influenza surveillance. The objective of the present study was to monitor antiviral resistance to assist public health authorities with decisions regarding prophylaxis and treatment strategies.

Using the real time polymerase chain reaction assay (rRT-PCR), influenza viruses of type A, subtype H1N1pdm09 and H3N2, as well as type B viruses, were identified and antiviral resistance testing was conducted using pyrosequencing[2] and Sanger dideoxy sequence analysis[5].

Prior to the emergence of the pandemic virus in 2009, the presence of the oseltamivir resistance-conferring marker, H275Y, was identified in seasonal influenza A (H1N1). In 2014, influenza virus surveillance identified the same marker, H275Y, in an influenza A (H1N1) pdm09 strain isolated from a 20 year-old pregnant woman living in Mato Grosso/Cuiabá, the Midwest region of Brazil. The virus was collected in March 2014. In addition, two permissive secondary NA mutations; V241I and N369K were detected in the virus isolated in the Midwest region of Brazil[1]. These mutations are known to negate the impact of the NA H275Y oseltamivir resistance mutation on viral replicative fitness. This patient was treated with oseltamivir, rocephin, azithromycin and made a full recovery from the respiratory disease.

The choice of assay for assessing the susceptibility of the influenza virus to NAIs depends on factors pertaining to appropriateness of the setting, cost, sustainability, speed in obtaining valid results, reliability in terms of predictive values, and accessibility. The high sensitivity of genotypic assays allows for testing of clinical specimens, thus eliminating the need for virus propagation in cell culture. In addition, rapid genotypic testing facilitates more appropriate patient management and can significantly advance and assist in large-scale epidemiological studies of drug-resistant variants[4].

Katia Corrêa de Oliveira SANTOS (1)
Daniela Bernardes Borges da SILVA (1)
Margarete Aparecida BENEGA(1)
Renato de Sousa PAULINO(1)
Elian Reis E SILVA Jr(1)
Dejanira dos Santos PEREIRA(2)
Aparecida Duarte Hg MUSSI(2)
Valéria Cristina da SILVA(1,3)
Larissa V. GUBAREVA(4)
Terezinha Maria de PAIVA(1)
(1) Laboratory of Respiratory Viruses NIC/WHO, Instituto Adolfo Lutz, São Paulo, SP, Brazil.
(2) Central Laboratory of Public Health of the Mato Grosso State, Cuiabá, Brazil
(3) Epidemiologic Surveillance Center of the Mato Grosso State, Cuiabá, Brazil.
(4) Molecular Epidemiology Team Virus Surveillance and Diagnosis Branch Influenza Division, Centers for Disease Control and Prevention, Atlanta, GA, USA
Correspondence to: Terezinha M. de Paiva, Instituto Adolfo Lutz, Nucleo de Doencas Respiratorias
Av. Dr. Arnaldo 355, 01246-902 Sao Paulo, SP, Brasil
Phone: 55 11 30682913, Fax: 55 11 30853505
E-mail: tterezinha@uol.com.br

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