OMICS Group Conferences
Accelerating Scientific Discovery
3rd World Congress on Virology
November 20-22, 2013 DoubleTree by Hilton Baltimore-BWI Airport, USA

Genomic analyses of pandemic and post-pandemic Influenza A pH1N1 viruses isolated in Rio Grande do Sul, Brazil

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Abstract

During the 2009 Influenza A pH1N1 pandemics in Brazil, the most affected state was Rio Grande do Sul (RS), with over 3,000 confirmed cases, including 298 deaths. While no cases were confirmed in 2010, 103 infections with 14 deaths by pH1N1 were reported in 2011. Genomic analyses of the circulating viruses are fundamental to understand viral evolution and to support vaccine development against these pathogens. This study investigated whole genomes of six pH1N1 virus isolates from pandemic and postpandemic periods in RS, Brazil. Phylogenetic analyses using the concatenated genome segments demonstrated that at least two lineages of the virus co-circulated in RS during the 2009 pandemic period. Moreover, our analysis showed that the post-pandemic pH1N1 virus from 2011 composes a distinct clade, whose ancestor belongs to clade 7. All six isolates presented amino acid substitutions in their proteins in relation to those from the archetype strains California/04/2009 and California/07/2009. The 2011 isolates present more amino acid substitutions and most of their genes were under purifying selection. Based on the amino acid substitutions in HA epitopes, the predicted vaccine efficacy against the 2011 isolates was 31.44% (dominant epitope D), while against the pandemic isolates was 39.84% (dominant epitope E).

Biography

Yajun Guo completed his MD. and Ph.D. from TMMU and SMMU in China and postdoctoral studies from Harvard Medical School. Dr. Yajun Guo has received many honor and awards. His is a distinguished professor and director at Shanghai International Joint Cancer Institute, PLA General Hospital Cancer Center and Chinese National Engineering Research Center for Antibody Medicine. He is also a PI of the National key Basic Research Program Project “Structure and function of antibody” and is conducting Seven clinical trials of therapeutic antibodies in China. Currently, Dr. Yajun Guo has several visiting professorships in USA, UK and Australia.