27th ECCMID Vienna, Austria 22 – 25 April 2017

The congress of ESCMID

Session: OS200 Respiratory viruses: diagnosis, management and outcome

Category: 1c. Influenza and respiratory viruses

25 April 2017, 15:06 - 15:16
OS1014

Frequency of respiratory viruses among patients admitted to 26 intensive care units in seven consecutive winter-spring seasons (2009-2016) in Northern Italy

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Background: The role of respiratory virus in the etiology of community-acquired pneumonia (CAP) is still debated. The advent of molecular assays has improved the identification of viruses in patients with CAP and according to published studies, viruses account for 11-55% of CAP cases among adults. However, many studies have so far only focused on the role of influenza A virus (e.g. H1N1pdm09) as etiologic agent of acute respiratory failure. On the other hand, respiratory viruses other than influenza such as human rhinovirus (HRV), human parainfluenza viruses 1-4 (hPIV1-4), human respiratory syncytial virus (hRSV) and human coronaviruses (hCoVs) might not be routinely searched for in respiratory samples of ICU patients, and their role as causes of ICU admission might not be fully appreciate.

Material/methods: In the present study, the frequency of respiratory viruses was evaluated in respiratory samples collected from 414 patients admitted to 26 ICUs in Lombardy region (10 million inhabitants) with CAP during seven winter-spring seasons (2009-2016).

Results: In 225 (54.3%) patients one or more respiratory viruses were identified, while 189 (45.7%) patients were negative. A single virus infection was observed in 213/225 (94.7%) patients, while in 12/225 (5.3%) at least two respiratory viruses were detected. The highest frequency of positivity (78.4%) was observed in the 2014-15 season, while the lowest (40.9%) was observed in the 2011-12 season.Influenza A was the most common virus in 139/225 patients (61.8%) followed by HRVs

(33/225, 14.7%), hRSV (13/208, 5.8%), influenza B virus (9/225, 4.0%), hCoVs (9/225, 4.0%), cytomegalovirus (9/225, 4.0%) and human metapneumovirus (1/225, 0.4%).

Conclusions: Viral infections were present in a large proportion of CAP in ICU-admitted patients. In addition to influenza A, it has been showed how rhinovirus account for a significant number of viral CAP. Finally, the use of lower respiratory tract samples appears more informative that upper respiratory samples to correctly estimate the burden of viral infections in patients with CAP.