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CO-INFECTIONS WITH INFLUENZA AND OTHER RESPIRATORY VIRUSES

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Human respiratory tract infections represent a major public health problem because they are often associated with significant morbidity and mortality and cause a considerable economic burden on the health-care system. Respiratory infections are caused by numerous viruses and the clinical distinction between different agents involved in infection is very difficult. Although the high rates of respiratory co-infections have been reported recently, the actual number of multiple infections are undoubtedly underestimated, mainly due to sensitivity of using methods and limited number of tested viruses. In majority of cases the most likely or casual viral agents are assayed first and the diagnostic ceases with detection of the first relevant infectious agent. Meanwhile rapid, reliable and accurate identification of every viral pathogen involved in infection is crucial for providing appropriate treatment, surveillance and prevention of nosocomial transmission. The National Influenza Centre in Poland received 140 specimens (paid diagnostics) from hospitalized patients with respiratory tract infection during season 2010/2011, including 49 specimens from severe cases of infection (i.e. patients from intensive care unit, with pneumonia, immunocompromised patients). In majority of these specimens, hospitals required only detection of influenza viruses (influenza type A (IVA) and B (IVB) (n=29) or IVA and A/H1N1/v (n=93)). The diagnostics not only for influenza, but also other respiratory viruses was commissioned only for 18 specimens. In these cases the multiplex Seeplex^{TM} RV12 ACE Detection Kit (Seegene Inc., Korea) were used to detect 12 respiratory viruses: IVA, IVB, respiratory syncytial virus type A (RSVA) and B (RSVB), parainfluenza type 1, 2 and 3 (PIV-1,-2,-3), human rhinovirus, human metapneumovirus, adenovirus, combined coronavirus (CoV) OC43/HKU1 and CoV 229E/NL63. Co-infections were found in 4 patients: patient 1 and 2 with Wegener's granuloma, lymphocytopenia and immunosuppressed therapy were infected with IVA/IVB/RSVA/RSVB/PIV-3 (5 viral agents) and IVA/RSVA (dual infection), respectively. The patient 3 (interstitial pulmonary disease with polymyositis and glycocorticoid therapy) was infected with IVA/IVB/RSVA/RSVB/CoV OC43/HKU1 (5 viral agents) and patient 4 (allergic pulmonary alveolitis and glycocorticoid therapy) was infected with IVA/RSVA/RSVB/CoV OC43/HKU1 (4 viral agents). Monoplex PCR with different primer sets for IVA, IVB and RSV showed the results consistent with multiplex PCR. Each of four patients was hospitalized in the same intensive care unit and all specimens were collected during one week that suggests the high probability of nosocomial transmissions. Additionally, in case of patient

2, the second specimen was collected and the interval from collection of the first one to the next was 19 days. This specimen was negative for IVA and RSVA, but positive for RSVB. Our findings show that in case of hospitalized patients with respiratory tract infection, especially in patients with severe course of infection and in the immunocompromised patients who are susceptible to serious complications, the simultaneous detection of multiple viral agents are advisable and more reliable than detection of only influenza viruses. This enables to reveal an accurate picture of the disease, improve patient management and infection control.