Title: Usefulness of multiplex real-time polymerase chain reaction for diagnosing community acquired pneumonia in Japanese adults

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Body: Background: Usefulness of multiplex real-time polymerase chain reaction (RT-PCR) and frequency of macrolide-resistant (MR) Mycoplasma pneumoniae (M. p) in Japanese adults are unknown. Aims: To diagnose causative pathogens of community acquired pneumonia (CAP) in Japanese adults with RT-PCR vs. conventional tests (sputum/blood culture, urine antigen for Streptococcus pneumoniae [S. p]/Legionella pneumophila [L. p], and paired serum of M. p antibody) and clarify frequency of MR M. p in Japanese adults. Methods: We prospectively enrolled 29 CAP patients ≥20 years old from Sep 2012 to Feb 2013. CAP was defined based on respiratory symptoms and laboratory/chest X-ray findings excluding noninfectious causes. We collected sputum, nasopharyngeal swab, urine, and blood samples of each patient. RT-PCR can identify 6 bacteria and 11 viruses in sputum and nasopharyngeal swab samples. Causative pathogens were identified by each test. MR gene was checked if PCR of M. p was positive. Results: Mean patient age (15 men) was 56 years, and 20 had taken previous antibiotics. Sensitivity was significantly higher in RT-PCR vs. conventional tests (69%, n=20 vs. 41%, n=12; P<0.05). Common causative pathogens by RT-PCR were S. p (n=10), M. p (n=7) and Haemophilus influenzae (n=4), including duplication, with 4 cases of mixed bacterial/viral infection. Four (57%) of 7 M.p patients were MR by RT-PCR. Conclusions: Since many patients had taken previous treatment, sensitivity of conventional tests was low, but RT-PCR was unaffected by this. RT-PCR was useful for CAP in Japanese adults. When M. p is suspected, RT-PCR is especially useful because sensitivity is high and MR can be checked.