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Title: Etiologies of acute exacerbation of bronchial asthma in adults by real-time polymerase chain reaction

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Body: Background: Most common microorganisms associated with acute exacerbation of bronchial asthma (AEBA) are respiratory viruses such as rhinovirus (RV) and atypical bacteria such as Mycoplasma pneumoniae (M. p). Causative organisms of AEBA in pediatric populations have been well documented; however, these have been rarely reported in adults. Recently multiplex polymerase chain reaction (PCR) has been applied to detect effectively both respiratory bacteria and viruses. Aims: To evaluate etiologies in adult AEBA, a rapid reliable process based on real-time PCR for respiratory samples was used. Methods: From September 2012 to January 2013, we prospectively enrolled adult AEBA patients who satisfied our criteria; 20 years of age or older, within 7 days of onset, and informed consent. Nasopharyngeal swab and sputum samples were collected from all patients and comprehensive real-time PCR was used to detect 6 bacteria and 11 respiratory viruses. Results: Among 36 patients who satisfied our criteria, 25 (69.4%) of them detected microorganisms both bacteria and/or viruses by PCR test. 7 (19.4%) were diagnosed with viral infection, 11 (30.6%) with bacterial infection, 3 (8.3%) with atypical bacterial infection, and 4 (11.1%) with viral/bacterial co-infection. The remaining 11 (30.6 %) had unknown pathogens. Most leading microorganisms were Haemophilus influenzae (H. i), M. p, and RV. Conclusions: Our results suggest usefulness of real-time PCR for nasopharyngeal swab and sputum sample in estimating etiologies in adult AEBA. Results of the detection of M. p and RV were as expected; however, H. i was unpredicted. Based on the results, we analyzed the association between microorganisms and AEBA.