Title: Prevalence of Some Pathogens Detected by Multiplex Real- Time PCR in Hospitalised Children with Acute Respiratory Infections

Objective: To investigate the prevalence and to detected some microorganisms using multiplex real-time PCR techniques in hospitalised children with acute respiratory infection (ARI).

Subjects and Methods: A retrospective cross-sectional descriptive study. There were 450 cases of ARI children treated at the pediatrics department in Bac Giang provincial general hospital though medical records with multiplex real-time PCR results of nasopharyngeal swab testing using both RP1 and RP4 kits were included in the study.

Results: Among 450 ARI children, the age group of under 60 months old accounted for the largest rate (81.6%). Influenza virus and RSV caused infection for infant and all ages group, focus on 2-60 months old group. The rate of pathogens detection using RP1 kit was 23.8% and the influenza infection rate was 13.6%, RSV was 10.2%. The rate of bacteria detected by RP4 kit was 40.0%. *S. pneumoniae*, *H. influenza* infection were found across all age group, focus on children under 5 years old. The rate of *S. pneumoniae* infection was 24.4% and *H. influenza* infection was 25.3%. *M. pneumoniae* infection was 2.4%, and such atypical pathogens mainly caused disease in the over 2 years old group. Some pathogens have low infection rate that included *B. pertusis* (0.2*%), L. pneumophila* (0.2%), *C. pneumoniae* (0.2%). Combining RP1 and RP4 kits could enhance the detected over all prevalence of the ARI pathogens was 53.8%. 10.0% of co-infections were detected. Influenza infection rate was highest in spring (10.5%), decreased in summer and autumn, and gradually increased in winter (5.6%). RSV infection rate was highest in winter (5.6%). *S. pneumoniae* and *H. influenza* infections were distributed equally over the year but the peaks found in November 2020 (7.1% - 6.0%) and January 2021 (5.8% - 6.9%) respectively. The highest rate of *M. pneumoniae* infection was in April 2021 (1.8%).

Conclusions: Among 450 ARI hospitalised children, when using multiplex real-time PCR kit RP1 and RP4 to test, the prevalence of some pathogenes were: 13.6% influenza; 10.2% RSV, 24.4% *S. pneumoniae*, 25.3% *H. influenzae*, 2.4% *M. pneumoniae*, 0.2% *B. pertusis*, 0.2% *L. pneumophila*, 0.2% *C. pneumoniae*, 13.8% were infected with 1 kind of virus, 30.0% were infected with 1 kind of bacteria and 10.0% were co-infection.