

Virology 2016: Molecular diagnosis and prevalence of Human metapneumovirus infection among Egyptian infants with acute viral bronchiolitis- Gamal El Sawaf- Alexandria University

Gamal El Sawaf

Alexandria University, Egypt

Background & Aim: Despite improved methods for identifying viral pathogens in cases of acute bronchiolitis, the etiology remains undetermined in a significant number of patients. Human metapneumovirus (hMPV) is one of the emerging respiratory viral pathogens that causes a spectrum of illnesses that range from asymptomatic infection to severe bronchiolitis. The aim of this study was to identify the prevalence of hMPV that contribute to bronchiolitis in infants and young children in Egyptian populations and to determine the comprehensive clinical characterizations of disease. **Methods:** Nasal swabs for viral detection were obtained from 117 Egyptian infants, clinically diagnosed as acute bronchiolitis at the Alexandria University Children's Hospital during the period from January to April 2015. Clinical and demographic data were obtained from parents and medical records; hMPV was detected by means of a reverse-transcriptase polymerase chain-reaction assay. Indirect immunofluorescent assay (IFA) assay methods were used to detect the presence of any of the most common respiratory viruses (respiratory syncytial virus (RSV), Influenza virus A, Parainfluenza virus types 1-3 and adenovirus) that might be involved in infection. **Results:** In our study, 76% of the cases were positive at least to one or more of the seven mentioned viruses. hMPV was detected in 19 (16 %) of the 117 children. The age-related incidence of hMPV infection was higher than that of RSV-infected children. Only 5 patients (4%) had hMPV as the sole respiratory viruses, whilst 14 cases (12%) had a co-infection of hMPV with other respiratory viruses. Clinical symptoms of hMPV were found to be similar to those seen with other respiratory viral infections. The most significant risk factors for acute bronchiolitis in our study groups were young age, exposure to tobacco and living in overcrowded environments. **Conclusions:** Human metapneumovirus infection is a leading cause of respiratory tract infection in the first 2 years of life, with a spectrum of disease similar to that of RSV. The risk factors identified in this study may be considered for interventional studies to control infections by these viruses among young children from developing countries. Further investigations to better characterize hMPV infection and its clinical effect are needed.

Lower respiratory tract infections are one of the leading causes of morbidity and mortality in children worldwide (Hustedt and Vazquez, 2010). Acute bronchiolitis is defined as an acute inflammation of the bronchiolar airways, which may cause airway obstruction and respiratory distress via bronchiolar wall oedema, spasm and mucous production within the bronchiolar

lumen (Sachdeva and Dutta, 2012). Several viruses can cause bronchiolitis.

Respiratory syncytial virus (RSV), parainfluenza viruses (PIV), influenza type A and adenovirus are some of the common viruses found in hospital studies (Debiaggi et al., 2012). Technological advances in the field of molecular biology have allowed virologists to detect many previously undetected viral pathogens (Hustedt and Vazquez, 2010), one of these pathogens was the human metapneumovirus (HMPV) which is a respiratory pathogen identified in The Netherlands in 2001, and was thought to cause upper and lower respiratory tract infections in children (Van den Hoogen et al., 2001).

It is an enveloped, non segmented, negative-sense RNA virus classified in the subfamily Pneumovirinae of the family Paramyxoviridae (Falsey et al., 2003).

Indeed, HMPV appears to be an important global cause of clinical manifestations, including upper respiratory tract infections, bronchiolitis, and pneumonia in young children. Its epidemiology in Africa is poorly described and factors that allow its recurrent epidemics in communities are not understood (Williams et al., 2004; Owor et al., 2016). The use of rapid tests for the diagnosis HMPV and other respiratory tract viral infections allows implementation of appropriate infection control measures, thus reducing nosocomial spread, and is useful for consideration of timely treatment with antiviral agents.

The clinical and financial benefits of the rapid detection of viruses in respiratory specimens have been demonstrated in several studies, indicating a direct correlation between a rapid turnaround time and decreased mortality, a decreased length of stay, overall costs, and better antibiotic stewardship (Macfarlane et al., 2005). The aim of this study is the molecular diagnosis of HMPV infections by using a real-time, reverse-transcriptase PCR assay and the evaluation of its prevalence among Egyptian infants clinically diagnosed with acute viral bronchiolitis. We also aimed to detect other common respiratory viruses and determine the presence of coinfections of HMPV and other respiratory viruses.