

The Role of Viral Coinfection in Bronchiolitis Treated With High-Flow Nasal Cannula at Pediatric Emergency Department During 2 Consecutive Seasons: An Observational Study

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Abstract

Background: The role of multiple respiratory viruses in bronchiolitis treated with high-flow nasal cannula (HFNC) has not been thoroughly investigated. We evaluated the contribution of coinfection on clinical course of bronchiolitis treated with HFNC and on response to this treatment.

Methods: We selected 120 children with bronchiolitis, younger than 12 months, admitted to Emergency Department between 2016 and 2018 and treated with HFNC. We compared single and multiple virus infections in relation to specific outcomes such as the clinical response to HFNC and the HFNC failure. The multiple virus infection was defined by the detection of 2 or more viruses in nasopharyngeal aspirates. The HFNC failure was defined as escalation to higher level of care, including Helmet-Continuous Positive Airway Pressure, invasive ventilation or transfer to pediatric intensive care unit within 48 hours from the time of HFNC initiation. We also performed a comparison between HFNC failure and HFNC not-failure groups according to the number of virus and the type of virus.

Results: The severity score post-HFNC initiation was significantly associated with coinfection [odds ratio (OR): 1.361; 95% confidence interval (CI): 1.036-1.786; P = 0.027]. The likelihood of coinfection decreased by 23.1% for each increase of saturation O₂ after HFNC initiation (OR: 0.769; 95% CI: 0.609-0.972; P = 0.028). Atelectasis was more likely to occur in coinfection (OR: 2.923; 95% CI: 1.049-8.148; P = 0.04). The duration of HFNC treatment increased significantly in coinfection (OR: 1.018; 95% CI: 1.006-1.029; P = 0.002). No significant differences were described between HFNC failure and the number and the type of detected viruses.

Conclusions: The detection of multiple viruses and the type of virus did not influence the HFNC failure, although the coinfection was associated with a deterioration of severity score, a longer HFNC treatment and a major presence of atelectasis. The role of coinfection on HFNC treatment might subtend a complex interplay between multiple viruses and host susceptibility.