

Can turbine ventilators in infants affected by acute bronchiolitis help in case of outbreak? A retrospective safety study

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Bronchiolitis is the principal cause of admission to hospital for children in high-income countries. This syndrome involves the lower respiratory tract with different clinical consequences, ranging between light infection to severe acute respiratory failure that require the ICU admittance for respiratory support.

The most suggestive but not specific clinical symptoms are rhinorrhea, cough, fever, crackles and/or wheezing, polypnea, dyspnoea, apnea, feeding difficulties and lethargy.

Since October 2022 to March 2023 a big wave of bronchiolitis was experienced in Milan area and in the region of Lombardia, causing surcharge overload of the pediatric ICU in the major hospitals.

Due to high number of patients the arriving in the emergency department requiring ICU treatment, shortage of ICU beds requested a difficult cooperation between the major ICU pediatric hubs of Lombardia.

In order to evaluate whether turbine ventilators could support the infants also outside the ICU, we tested these types of ventilators in 37 patients with respiratory failure unresponsive to HFNC oxygen therapy. We used different interfaces: nasal mask, oro-nasal mask, full face mask. The monitoring data are: SpO₂, SpO₂/FiO₂, respiratory rate, respiratory effort, apnea.

After one hour from the start of the treatment all patients improved their parameters.

No patients had respiratory complications (no barotrauma, no volutrauma) nor skin lesions related to NIV interfaces.

This preliminary experience suggests that the use of turbine ventilators in infants with acute ventilators is safe and free from severe complication.

Therefore, we hypothesize that in case of a new outbreak of acute bronchiolitis with high number of infants non-responsive to HFNC therapy, these ventilators may help supporting the little patients both in the ICU and outside the ICU (emergency departments, pediatric departments, during the transport from peripheral hospital to the hub hospital), allowing a better managements of ICU beds.