Noninvasive ventilation in prehospital settings

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Abstract

The prehospital use of non-invasive ventilation (NIV) by emergency medical services is increasing. Applying NIV in the prehospital setting began to gain more attention in the late 1990s when the primary form of non-invasive positive pressure ventilation emerged as a substitute to endotracheal intubation. For the last several years, NIV has become the standard of care for acute cardiogenic pulmonary edema and exacerbation of chronic obstructive pulmonary disease patients in the prehospital setting. A remarkable number of studies demonstrate a reduction in mortality and intubation rates in comparison to standard care when NIV is initiated in the prehospital setting, though there is a lack of evidence to strongly recommend the use of prehospital NIV as a first choice. An in-depth understanding of the science and technological background of NIV machines and interfaces can help attending clinicians in the prehospital setting and thus enhance therapeutic effectiveness by maximizing patient comfort, safety, and stability. Selections of the patients, devices, and interfaces, as well as achieving good patient-ventilator synchrony, are the key aspects of a successful outcome.

Conclusion

NIV is beneficial to selected patients in the form of shorter ICU stays, reduced mortality, and intubation rates when applied in the prehospital setting. By stipulating that NIV treatment is provided by a proficient emergency crew, a negligible amount of additional time is needed to apply NIV. With technology advancements, implementation of care plans/protocols, and extensive training of resource personnel, CPAP deemed to be the first choice of intervention, since it is inexpensive and easy to execute in clinical routine. However, this issue demands more research, and larger RCTs are essential to consolidate an evidence base for NIV use in prehospital settings.