



NEW JERSEY'S HOSPITAL SERVICE CORPORATION

4806 MEGILL ROAD • WALL TOWNSHIP, NEPTUNE, NJ 07753

PHONE: 732-919-3045 • FAX: 732-919-2735 • INTERNET: WWW.MONOC.ORG

A Non-Profit Cooperative to Improve Health Care and Reduce Members' Costs

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(Study conducted jointly with Clara Maass Medical Center Emergency Department)

Pre-hospital Use of Continuous Positive Airway Pressure (CPAP) For Acute Severe Congestive Heart Failure (CHF)

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Objective:

To describe the pre-hospital use of CPAP for patients presenting with acute severe CHF in a large Emergency Medical Services (EMS) system in New Jersey.

Methods:

This study utilized a retrospective design of prehospital charts of patients treated by paramedics in the Monmouth-Ocean Hospital Service Corporation (MONOC) EMS system (a large prehospital system serving multiple hospitals in NJ) for acute CHF. Inclusion criteria were placement of CPAP therapy by Mobile Intensive Care Unit protocol, respiratory rate greater than 25, labored and shallow breathing, bilateral rales, history of CHF, intact mental status and prehospital clinical diagnosis of CHF. Data collected included patient demographics, vital signs, oxygen saturation by pulse oximetry, need for endotracheal intubation, and complications. All patients meeting inclusion criteria from 1/1/2005 to 12/31/2006 will be included in this study.

Results:

A total of 1306 charts were reviewed. Three hundred and eighty-seven patients met study inclusion criteria. Of these 387, 149 patients had placement of CPAP (38.5%). When comparing patients that received CPAP to ones that did not, the out of hospital treatment times did not differ (CPAP=30 min; Non-CPAP= 31 min; P value <0.01); Adjunctive CHF treatment such as use of nitrates, diuretics, morphine were similar between the two groups. The increase in post treatment oxygen saturation was greater for the CPAP treated group (9%) vs. the control group (5%). This difference was statistically significant (P <0.01). This was also true for Systolic Blood Pressure (BP) reduction.

(CPAP [27.1 mmHg], non-CPAP [19.9 mmHg], P <0.01), Diastolic BP reduction (CPAP [14.1 mmHg], non-CPAP [7.4 mmHg], P <0.01), Heart Rate (HR) reduction (CPAP [17.2 bpm], non-CPAP [9.6 bpm], P <0.01), as well as Respiratory Rate (RR) reduction (CPAP [5.63], non-CPAP [4.09], P <0.01). Rate of pre-hospital endotracheal intubation was higher in the non-CPAP group vs. the CPAP group (CPAP (2.6%), non-CPAP (5.46%), P <0.01).

Conclusion:

The use of CPAP for eligible patients with acute severe CHF appears to be feasible and beneficial. Its use appears to result in improvement in oxygen saturation, improvement of vital signs and decreased rates of prehospital intubation. Large scale randomized prospective prehospital studies are needed to validate these results.