European Respiratory Society
Annual Congress 2013

Title: Outcome of non-invasive ventilation in acute hypercapnic respiratory failure in a recently established respiratory ward

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Body: Non-invasive ventilation (NIV) is a well established therapeutic tool in acute exacerbation of COPD (AECOPD) and obesity hypoventilation syndrome (OHS) and to a lesser extent in other causes of acute hypercapnic respiratory failure. Aim: To present the results of NIV applied in an acute setting in a newly established respiratory service in an emergency hospital. Methods: Consecutive patients presenting at the emergency room of a general hospital in 2012 with acute hypercapnic respiratory failure have been treated in a respiratory ward with NIV through an oronasal or full facial mask. Results: 33 patients were included, 16 men, mean age 66 years-old, 22 with AECOPD and 4 with OHS. NIV failed in 6 patients (4 with AECOPD) and in-hospital death supervened in the same 6 patients. Initial blood gases values (PaO_2, $PaCO_2$, pH and HCO_3-) did not differ between dead and surviving patients. $PaCO_2$ and pH had a significant improvement in the first hours and at discharge in surviving patients (see table). PaO_2 had a significant decrease at 4-6 hours. Mean length of stay in hospital was 8.5±7.5 days. Out of 27 surviving patients 5 were discharged on home NIV and 18 on home oxygen therapy.

	Baseline	1-2h NIV		4-6h NIV		Discharge	
	n=33	n=22	p vs baseline	n=28	p vs baseline	n=27	p vs baseline
PaO2 (mmHg)	68±27	59±17	0.19	55±20	0.03	68±20	0.49
PaCO2 (mmHg)	82±16	76±15	< 0.01	68±14	< 0.001	60±12	< 0.001
pH	7.23±0.06	7.28±0.08	< 0.001	7.34±0.09	< 0.001	7.41±0.05	< 0.001

Conclusion: NIV was efficient in improving hypercapnia and acidosis in acute hypercapnic respiratory failure, with a reasonable failure rate. Initial blood gases values did not predict NIV failure or death in this population.