The Prehospital Treatment of Acute Cardiogenic Pulmonary Edema

Karl A. Sporer, MD

- Patients with shortness of breath account for 30% of prehospital calls.
- A recent Canadian study demonstrated that the addition of ALS service decreased SOB related mortality by 23%. This is the best current evidence demonstrating clinical benefit for prehospital ALS care.

Epidemiology of Acute Cardiogenic Pulmonary Edema

- The direct costs of congestive heart failure (CHF) exceeded $38 billion in 1991 and represented 5.4% of the total healthcare cost.
- Acute hospitalization accounts for 69% of the expenditure for heart failure.
- Of the patients that are hospitalized for CHF exacerbation, 35% or more present with acute cardiogenic pulmonary edema (ACPE).
- This group of patients makes up 3-5% of all prehospital calls.

Prehospital Experience

- Median Age of 75
- Mostly occur at night
- 15% will require mechanical ventilation
- 15% will have an MI
- Mortality for the hospitalization is 10-15%  
- 1 year mortality of 40-50%
- 10% will present with cardiogenic shock
- Prior ACPE episodes
- (60%)
- Prior ischemic heart disease (85%)
- Prior hypertension
- (70%)

Does prehospital treatment of ACPE help our patients?

- Two retrospective prehospital demonstrated that the prehospital treatment of pulmonary edema significantly decreased hospital mortality from 15.4% to 6.7%.
• There are likely multiple unmeasured clinical improvements, e.g. decreasing intubation rates, MI rates, length of hospital or ICU stay, etc.

Treatment Points

• Most of the treatment benefits come from the aggressive use of nitroglycerin.

• Our current treatment protocols allows up to six (6) sublingual nitroglycerins as long as the systolic blood pressure is greater than 90 mm Hg. ACPE patients are generally nitrate resistant and require multiple doses for optimum effect.

• Morphine has been demonstrated to decrease anxiety of the patient and the medic. It has little effect on mortality and also has been shown to increase the intubation rate. Morphine should be used sparingly in these patients.

• Lasix has a questionable role in the prehospital treatment of ACPE. It may help slightly in obvious ACPE patients and it may be harmful to those patients that are misdiagnosed (20% of patients that are thought to be ACPE).

• Albuterol has some theoretical benefits but there is little clinical proof of benefit or harm in these patients.

Take Home Points

• Current ALS treatment causes a significant improvement in complications and mortality in patents with ACPE.

• Optimal management may improve this even more. We are suggesting the aggressive use of nitrates as tolerated by blood pressure and decreasing the use of morphine and lasix.

• Diagnostic accuracy needs improvement. Both paramedics and ED physicians commonly make the wrong diagnosis. These are usually very complicated patients with multiple pulmonary complaints that require
several days to sort out. Treatment algorithms need to be developed to allow us to optimize treatment in those patients that will benefit most.

References:
