State of the Evidence for Emergency Medical Services (EMS) Care of Respiratory Distress: An Analysis of Appraised Research from the Canadian Prehospital Evidence-based Practice (PEP) Project

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Introduction

Emergency medical services (EMS) leadership and practitioners require timely, accurate evidence, particularly for high acuity conditions such as respiratory distress. The Canadian Prehospital Evidence-based Practice (PEP) project is an online, freely accessible, continuously updated EMS evidence repository. Our objective was to describe the body of research for EMS care of respiratory distress.

Methods

Pubmed was systematically searched using MeSH and title/abstract key words. One author reviewed titles and abstracts for relevance. Included studies were scored by trained appraisers on a three-point Level of Evidence (LOE) scale (based on study design and quality) and three-point Direction of Evidence (DOE) scale (supportive, neutral, or opposing findings). Second party appraisal was conducted for included studies. Interventions were plotted on 3x3 tables (DOE x LOE) for each clinical condition, based on appraised study scores. The primary outcome was identified for each study and categorized. The most common primary outcome for each condition described.

Results

The search returned 426 records; 71 were appraised for 60 interventions in six adult and pediatric conditions. Evidence for respiratory interventions: supportive-high quality (n=21, 35%), supportive-moderate quality (n=4, 6.7%), supportive-low quality (n=1, 1.7%), neutral-high quality (n=9, 15%), neutral-moderate quality (n=10, 16.6%), neutral-low quality (n=6, 10%), opposing-high quality (n=1, 1.7%), opposing-moderate quality (n=0, 0%), opposing-low quality (n=1, 1.7%). Seven (11.6%) interventions had no evidence. Clinical conditions with interventions with the highest quality supportive evidence were: adult asthma (n=8, 13%), pediatric wheeze (n=6, 10%) and adult chronic obstructive pulmonary disease (COPD) (n=4, 6.7%). Predominant study primary outcomes in each condition: pediatric stridor - admission (5, 72%); pediatric wheeze - pulmonary function (13, 25%)/admission (13, 25%); adult asthma - pulmonary function (49, 65%); COPD - mortality (6, 20%); congestive heart failure - mortality (27, 54%); respiratory distress not diagnosed - mortality (2, 40 %).

Conclusion

PEP found most EMS respiratory distress interventions are informed by high quality evidence with supportive results. Some interventions have no relevant evidence. Leading study primary outcome measures were more commonly process than patient-oriented. Future research should focus on high quality studies filling identified evidence gaps using patient-oriented outcomes to best inform EMS respiratory distress care.