Point-of-care blood gas analysis and ultrasonographic examinations performed by EMTs may reduce the admission rate of patients with COPD

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Background

In Denmark, the emergency medical technicians (EMTs) are obliged to transport most patients to the emergency department following prehospital treatment.
From both a patient´s view and from a political and economic perspective, this transport and admission to hospital may be inconvenient.
We established an EMT-driven on-site assessment-and-treatment program of patients with COPD utilizing ultrasonography (US) and blood analysis.
The objective of the program was to identify and exclude severe differential diagnoses found in patients with acute respiratory insufficiency. This would render treat-and-release a feasible option for patients with minor exacerbations of COPD.

Methods

In a teaching program of six hours, 100 EMTs manning the ten most busy ambulances in the region were taught to perform pulmonary ultrasonography and to analyze blood samples.
Following the initial treatment of patients with COPD with bronchodilators, eligible patients were included in the program and examined using pulmonary ultrasonography aimed to rule out potential life threatening differential diagnoses by exclusion of pneumothorax, interstitial syndrome, and pleural effusion. Further, blood testing was performed including C-reactive protein and acid-base-analysis of venous blood.
The results were relayed to a prehospital physician using telemedical applications.
Based on the results and the communication with the EMT, the physician could prescribe corticosteroids and antibiotics and instruct the EMT to release the patient at the scene. The patient was directed to contact the General Practitioner on one of the following days.

Results

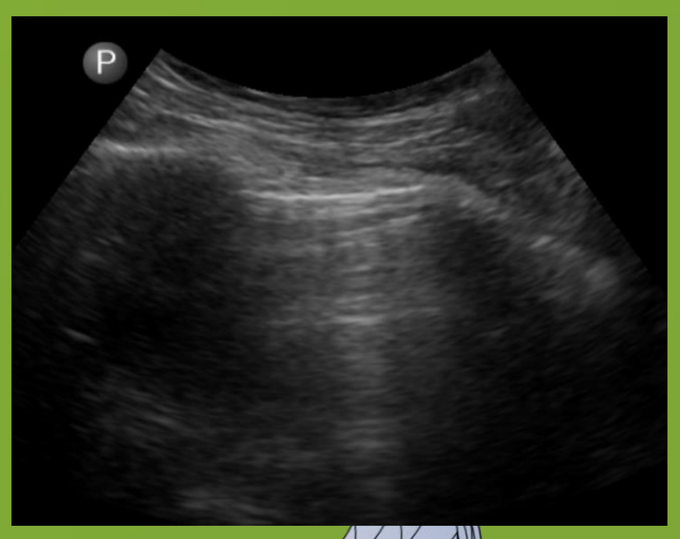
During the seasonal peak of the occurrence of COPD (October 2018 – April 2019) 753 patients were treated by the ambulance crews in the relevant ambulances. 114 patients were eligible for inclusion. 44 patients were included. 21 patients could be released at the scene following treatment. In 14 cases, equipment failure resulted in protocol failure.

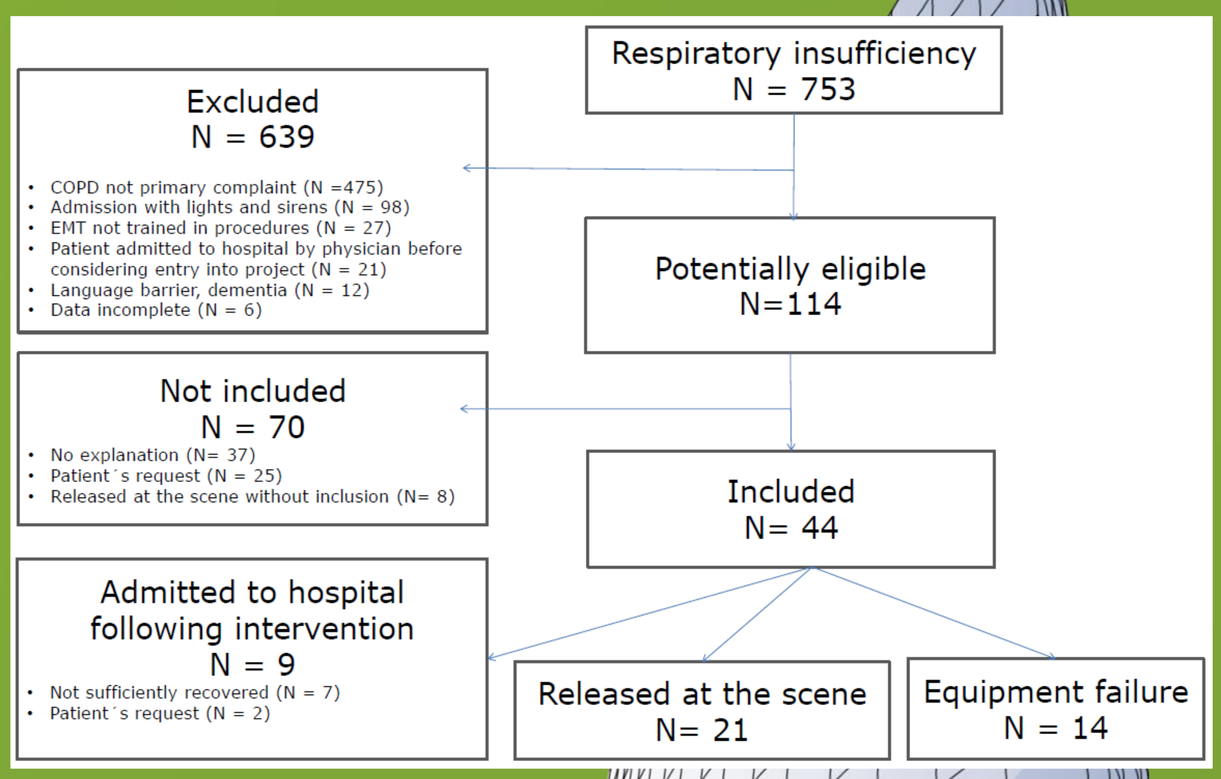
Discussion

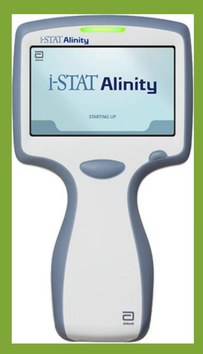
Most of the COPD patients requiring immediate assistance from the emergency medical system had a complex array of complaints. The relatively few patients suffering from simple exacerbations of COPD could be examined and treated and released in their homes following the comprehensive program.
The program was easily implemented and the quality of the ultrasonographic examinations was good. However, we experienced technical difficulties in one third of the blood analyses.

Conclusion

The factors that drive many patients with COPD to contact the emergency medical system are a vast array of COPD-related problems. It is, however, possible to establish an advanced EMT-driven, telemedicine-based program directed at COPD patients, rendering a treat-and-release program feasible in patients with complaints related primarily to their COPD.







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