Non-invasive Carboxyhemoglobin Monitoring: Screening Emergency Medical Services Patients for Carbon Monoxide Exposure.

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Introduction

Carbon monoxide (CO) toxicity is a significant health problem. The use of non-invasive pulse CO-oximetry screening in the emergency department has demonstrated that the rapid screening of numerous individuals for CO toxicity is simple and capable of identifying occult cases of CO toxicity. The objective of this study was to extend the use of this handheld device to the prehospital arena, assess carboxyhemoglobin (SpCO) levels in emergency medical services (EMS) patients, and correlate these levels with clinical and demographic data.

Methods

This was a retrospective, observational, chart review of adult patients transported to hospital emergency departments by urban fire department EMS ambulances during a six-week period. Each ambulance used a non-invasive pulse CO-oximeter (Rad-57, Masimo Inc.) to record patients' COHb concentrations (SpCO) along with the standard EMS assessment data. Spearman's Rank Correlation tests and Student's *t*-tests were used to analyze the data and calculate relationships between SpCO and other variables (age, gender, respiratory rate, heart rate, mean arterial pressure, and oxygen saturation measured by pulse oximetry).

Results

A total of 36.4% of the patients transported during the study had SpCO documented. Of the 1,017 adults included in this group, 11 (1.1%) had a SpCO >15%. There was no correlation between SpCO and heart rate, ventilatory rate, mean arterial pressure, and oxygen saturation.

Demographics and SpCO Values for 1017 Patients with Documented Reading:

Age mean +/- SD (yrs)	47.6 +/-20.1
SpCO mean +/-SD (%)	3.66% +/- 3.66
SpCO Range (%)	1 -28
SpCO >5%	241 (23.7%)
SpCO> 15%	56 (5.5%)
SpCO>15%	11 (1%)

Conclusions

Screening for CO toxicity in the EMS setting is possible, and may aid in the early detection and treatment of CO-poisoned patients.