

The Incidence of Carbon Monoxide Poisoning During CO Alarm Investigations.

Hostler D., Roth R.N., Kaufman R.E., Katz K.D., Brooks D.E., Pizon A.F., O'Toole K. *Prehosp Emerg Care* 2008; 12 (1): 48.

Background

Calls for carbon monoxide (CO) alarm activation are common among fire and EMS agencies. However, while monitoring a structure for CO levels is common, the relationship between ambient CO and carboxyhemoglobin (COHb) levels in exposed individuals is unknown. Objectives: A novel strategy was implemented using a non-invasive (SpCO) device to determine whether a correlation existed between ambient CO levels and COHb in the exposed occupants.

Methods

As part of a QI initiative, noninvasive SpCO monitors (RAD-57, Masimo) were placed with three heavy rescue companies which were routinely dispatched to CO alarms. Responders obtained COHb levels on all occupants in a structure where environmental CO was measured with a standard four-gas meter. Age, gender, vital signs, and treatment disposition were documented in all patients. The relationship between ambient CO and COHb levels was identified with a Pearson's Correlation Coefficient.

Results

94 patients from 48 separate incidents had COHb and ambient CO levels recorded. 75.5% of calls were for audible CO alarms while the remaining were dispatched by the first arriving EMS crews as suspicious for CO poisoning. 63 (67%) of subjects were female and 64 (68%) were smokers. Nine (11%) subjects were transported to the emergency department (ED). All of these patients transferred to the ED were symptomatic with mean on-scene COHb level of 27.8% (19.5, 36.1). ED serum COHb levels obtained in these nine patients were 22.1% (17.0, 27.2). Mean COHb for those not transported to the ED was 3.2% (2.6, 3.8) and no individual had a level higher than 10%. Ambient CO levels ranged from 0-1500 ppm with a mean of 84.0 (95% CI: 34.6–133.5). Ambient CO and COHb measured noninvasively on the scene were correlated highly ($r^2 = 0.66$, $p < 0.001$).

Conclusions

Noninvasive COHb accurately identified subjects with elevated serum CO. In this cohort, ambient CO levels below 200 ppm were never associated with COHb levels above 10% although the duration of exposure could not be accurately determined. CO oximetry may be a useful adjunct when assessing occupants from a CO contaminated structure.