Carbon monoxide poisoning in wood pellet storerooms

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Background and objectives

• Carbon monoxide (CO) is the leading cause of mortality due to unintentional poisoning in Europe and the USA.

• The main sources of CO in unintentional exposures are internal combustion engines, gas water heaters, wood stoves and fireplaces.

• In Europe the use of wood pellet heating has increased in recent years due to its low cost and „eco-friendliness“

• Life-threatening CO concentrations were reported in large wood pellets storerooms aboard ships, only a few cases in household storerooms
Case report

- An unconscious victim was found in a wood pellet storeroom.
- A team of firemen evacuated the victim and performed CPR.
- Soon afterwards, they experienced headache, nausea, dizziness and fatigue.
- 15000 ppm of CO was detected in the pellet storeroom.
- Carboxyhaemoglobin (CO-Hb) levels in firemen ranged up to 10%. They were treated with oxygen until their symptoms resolved and CO-Hb levels were normal.
- The autopsy of the victim confirmed CO poisoning.
Discussion

• CO forms in wood pellet storerooms due to the degradation of wood at usual temperatures and humidity mainly in freshly produced or recently filled pellets.

• Emission rate factors are: storage temperature, headspace to the pellet volume ratio (oxygen level), wood species and age of pellets.

• Wood pellets may constitute an occupational and domestic health hazard.

• Precautionary steps: CO detectors, ventilation systems, warning signs and locks on access doors, strict entry procedures.