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In agreement with the study by Fazekas and colleagues [1] in a recent issue of Critical Care, an increase in the concentration of carbon monoxide (CO) has been observed after surgery and cardiopulmonary bypass and during sepsis [2]. Although inflammation induces heme oxygenase and the above-mentioned conditions do lead to inflammation, a clear association in humans has not been established, underlining the relevance of the remarks made by Cove and Pinsky [3] in the same issue of Critical Care. We would like to present data that illustrate that inflammation does increase CO in humans in vivo.

During experimental endotoxemia in humans, a controlled immune response is evoked, leading to increased levels of several pro- and anti-inflammatory markers [4]. Recent experiments demonstrated that, in 38 healthy male volunteers infused with US Standard Reference Endotoxin (National Institutes of Health, Bethesda, USA) obtained from Escherichia coli O:113 at a dose of 2 ng/kg, tumor necrosis factor-alpha concentrations increase at t = 2 hours to a median of 610 pg/mL (interquartile range of 400 to 853 pg/mL; Friedman test $P < 0.001$) and arterial carboxyhemoglobin levels increase by 42% at 4 hours after lipopolysaccharide infusion (Friedman test $P = 0.0057$) (Figure 1). During these experiments, subjects breathed ambient air in a climate-controlled room; therefore, Cove and Pinsky’s claim that an increase of CO is due to an increase in inhalation is unlikely.

Interestingly, the anti-inflammatory effects of CO have also been studied in this model. Although CO has had clear beneficial effects in several animal studies, inhaled CO during experimental endotoxemia failed to influence the inflammatory response in humans [5], making it unclear whether the artificial increase of CO could benefit critically ill patients.

**Abbreviation**

CO, carbon monoxide.

**Competing interests**

MJD is a recipient of an AGIKO grant of the Netherlands Organization for Health Research and Development (ZonMw).

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Published: 23 April 2012

References

doi:10.1186/cc11295
Cite this article as: Dorresteijn MJ, Pickkers P. Carboxyhemoglobin levels during human inflammation. Critical Care 2012, 16:424.