A new chinese restaurant syndrome: the 'chinese fondue' carbon monoxide mass intoxication

Bernard-Alex Gaüzère, Yasmina Djardem, Arnaud Bourdé and Philippe Blanc

Address: Service de Réanimation, CHD Félix Guyon, 97405 Saint-Denis, Réunion, France.

Correspondence: Dr bernard-Alex Gaüzère, Service de Réanimation, CHD Félix Guyon, 97405 Saint-Denis, Réunion, France.
Tel: 0262 90 56 90; fax: 0262 90 77 36; e-mail: bgauz@guetali.fr

Keywords: carbon monoxide, intoxication, chinese fondue

Received: 10 December 1997
Revisions requested: 11 March 1998
Revisions received: 4 June 1998
Accepted: 16 February 1999
Published: 15 March 1999

Crit Care 1999, **3**:55

The original version of this paper is the electronic version which can be seen on the Internet (http://ccforum.com). The electronic version may contain additional information to that appearing in the paper version.

In this paper, we report a rare and original case of carbon monoxide (CO) mass intoxication. CO is produced in large amounts in industry as well as by gasoline engines, home appliances and the incomplete combustion of wood, natural gas, and tobacco products. It is rapidly absorbed through the lungs and binds to hemoglobin, forming carboxyhemoglobin (COHb), with an affinity 210 times that of oxygen. CO is a toxic gas that interferes with oxygen transport and utilization. It produces its adverse effects by reducing the amount of available oxyhemoglobin, and by displacing the oxygen–hemoglobin dissociation curve to the left. The net effect is profund tissue hypoxemia [1].

A traditional component of the Réunion island gastronomy, the chinese fondue, attracts many people. On 17 August 1996 (in the southern hemisphere winter) several children and then adults among 100 customers in a chinese restaurant suddenly presented dyspnea, nausea, vomiting, headache, confusion and clumsiness. Neither loss of consciousness nor syncope were noted. The victims (17 children, including an infant, mean age 10 ± 4 years, and 36 adults, including a pregnant woman, mean age 41 ± 10 years) were sitting around several chinese charcoal-pans cooking a chinese fondue. The atmosphere was confined, with closed windows and a non-functioning air conditioning system. The relief team removed the victims from the site of exposure, administered normobaric oxygen (10 l/min), and evacuated them to the nearby hospital. Out of 53 subjects, two refused to undergo further medical attention and left the hospital, having received oxygen and before any blood samples were taken.

After 60–90 min intensive oxygenation, the average level of COHb measured in patients was as follows (38 results only could be traced by the time of the study): one case, 12% (47-year-old female); eight cases, 10% (6-year-old male, 11-year-old female, 12-year-old female, 12-year-old male, 35-year-old female, 39-year-old female, 45-year-old male and 61-year-old female); one case, 7.4%; seven cases, 4.8%; and 21 cases, 2% or less.

The CO intoxication was confirmed by the carboxyhemoglobin dosages, bearing in mind that the CO half-life decreases to 40–80 min when breathing 100% oxygen.

As symptoms resolved with oxygen, there was no indication of hyperbaric oxygen therapy [2,3]. Nevertheless, the infant and the pregnant woman required treatment for several hours as fetal hemoglobin has a high affinity for carbon monoxide. Twenty-one victims were hospitalised for 12–24 h. All fully recovered.

The clinical manifestations, although mild, the combustion of charcoal in a confined atmosphere, and the moderately elevated levels of COHb after intensive oxygenation all confirm the CO intoxication. CO intoxication is a rather rare event in a tropical environment, where the winter is mild. This is the first case of CO intoxication ever reported in our hospital, and is the first instance of the chinese fondue being the prime cause.

References

1. Mofenson HC, Caraccio TR, Brody GM: **Carbon monoxide poisoning.** *Am J Emerg Med* 1984, **2**:254–261.
2. Coric V, Oren DA, Wolkenberg FA, Kravitz RE: **Carbon monoxide poisoning and treatment with hyperbaric oxygen in the subacute phase.** *J Neurol Neurosurg Psychiatry* 1998, **65**:245–247.
3. Norkool DM, Kirkpatrick JN: **Treatment of acute monoxide poisoning with hyperbaric oxygen: a review of 115 cases.** *Ann Emerg Med* 1985, **14**:1168–1171.