

Carbon monoxide (CO) poisoning, a silent epidemic

VICENÇ FERRÉS-PADRÓ¹, SILVIA SOLÀ MUÑOZ¹, JAVIER JACOB RODRÍGUEZ², SILVIA MEMBRADO-IBÁÑEZ¹,
MONTSERRAT AMIGÓ TADÍN³, SANTIAGO NOGUÉ XARAU³

¹Prehospital Emergency Department in Catalonia (SEM), Barcelona, Spain

²Hospital de Bellvitge, Spain

³Hospital Clínic i Provincial de Barcelona, Spain

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Dear Editor,

We have read carefully the article “Co-morbidities in the multiple victims of the silent killer in carbon monoxide poisoning”, recently published in your magazine [1]. Our team has recently analyzed the performance of prehospital emergency systems in Catalonia, with a coverage of 7.5 million inhabitants (18% of the population of the Spanish state), regarding the performance of patients exposed to toxic substances (especially CO and fire smoke). We found interesting to share similarities and differences between both populations. Poisoning is 3% (5400 cases/year) of the activity performed by the Advanced Life Support (ALS) Units of the Medical Emergency System in Catalonia, of which 15% cases are related to CO poisoning (2015: 681 cases; 2016: 862 cases; 2017: 892 cases). In Spain, poisoning by CO and smoke from fires represents 1.5% of the total poisonings treated in the emergency services, with about 3000 cases/year (250–300 cases/year in Catalonia), being associated with a fire in more than 66% of cases [2]. Far below the poisonings caused by drugs taken care of in hospital emergency services, which in Spain can represent up to 50% of total poisonings [3]. On the other hand, CO poisoning is present in 3–4% of the reasons of consulting in pediatric emergency services [4] and much higher than other poisonings treated in these services, such as cannabis poisoning, although the latter has a greater media impact [5]. Mortality related to fires in Spain has increased during the last four years, after a tendency to decrease from 1980 since 2015 (Figure 1). A study carried out by the medicalized teams of the firefighters in Catalonia showed that 57.8% of those affected were men and 73% of the cases were between 18–65 years. The smoking habit was present in 14% and we observed a relevant background in 17.4% of the patients. Baseline oxygen (oxyhemoglobin) saturation (SpO₂) was lower than 95% in 11.1% of patients and 11.4% had CO (carboxyhemoglobin) saturation (SpCO) levels $\geq 10\%$ [6]. In a study that included the performance of all ALS Units of Catalonia prehospital emergency service, 1676 episodes were collected in adults due to exposure to CO, which accounted for 10% of total assistances for toxic substances. In 66.1% of cases, SpCO record was obtained with pulse oximetry, with a SpCO $>10\%$ in about 30%. Males predominated (58.2%), with an average age of 46 years and standard deviation (SD) of 18.8, in the context of exposure to accidental CO at home, affected by smoke from a fire and with a duration of exposure less than one hour. In our study, no pathological background of interest was identified in the majority of cases (71.3%), 3.2% had previous respiratory pathology. In 2.8% of cases, there was suicidal ideation (Table 1). The most used treatment was oxygen therapy, administered in 73.7% of the episodes and of these, in 75.8% of cases was supplied with an inspired fraction of oxygen expressed in concentration and measured in percentage (FiO₂) $>80\%$. Hydroxycobalamin was given in 25 (1.5%) cases. There were eight (0.5%) cases of death at the exposure site. During the study period, the compliance of 11 quality indicators already defined in 2006 by the *Spanish Toxicology Association* was analyzed in five of them the recommended standard was not reached. These data lead us to insist on the need of carrying out actions to improve the level of care in these patients from the first moment by the prehospital emergency systems [7, 8].

Conflict of interests

The authors do not have conflict of interests.

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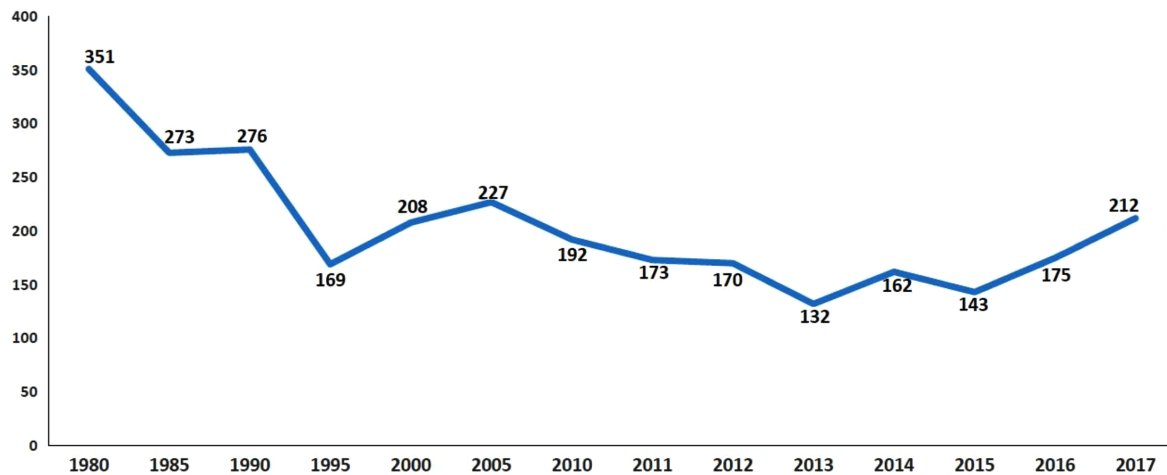


Figure 1 – Mortality related to fires in Spain (1980–2017).

Table 1 – Comparison between patients with SpCO measured and not measured

	Total (n=1676)	Measured SpCO (n=1108)	Not measured SpCO (n=568)	p-value
Age [years], median (SD)	46 (18.8)	45.1 (18.4)	47.7 (19.3)	0.007
Age >50 years	641 (38.2)	400 (36.1)	241 (42.4)	0.012
Males	976 (58.2)	655 (59.1)	241 (56.5)	0.307
CO plus more toxics	1473 (87.9)	953 (86)	527 (91.5)	0.001
No relevant background	1175 (71.3)	787 (71.5)	388 (70.8)	0.775
Previous respiratory pathology	53 (3.2)	32 (2.9)	21 (3.8)	0.309
Psychiatric pathology	46 (2.8)	37 (3.4)	9 (1.6)	0.046

CO: Carbon monoxide; n: No. of patients; SD: Standard deviation; SpCO: CO (carboxyhemoglobin) saturation.

Corresponding author

Vicenç Ferrés-Padró, RN, PhD, Prehospital Emergency Department in Catalonia (SEM), C/ Pablo Iglesias, 101–115, 08908 L'Hospitalet de Llobregat, Barcelona, Spain; Phone 0034932644400, e-mail: vicencferres@gencat.cat

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