Pulmonary Edema in Acute Carbon Monoxide Poisoning

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Summary. The chest radiograms and the arterial P\textsubscript{\text{O}}\textsubscript{2} values were studied in 61 patients suffering from severe acute CO poisoning. 22 patients (36.1%) showed abnormalities on chest film taken at the time of admission. The radiologic pulmonary abnormalities were classified into three patterns: 1. ground glass density, 2. interstitial edema, and 3. intraalveolar edema.

Particular emphasis was placed on the diffuse, homogenous and hazy density like ground glass on chest films, as the patients who presented "ground glass density" showed marked hypoxemia at the time of admission. Clinical symptoms of pulmonary edema were manifested in 4 cases (6.6%) in this series of patients.

Pulmonary edema in acute CO poisoning is far commonner than previously considered, and possible mechanism to develop it was discussed.

Key words: Pulmonary edema — Acute carbon monoxide poisoning — Ground glass density — Vascular permeability — Hyperbaric oxygenation.

Although the frequent occurrence of abnormal respirations in acute carbon monoxide (CO) poisoning, little is known about pulmonary edema in CO poisoning with the exception of occasional case reports [5]. The reason is mainly that the documentation of the radiologic pulmonary abnormalities is usually difficult because of the intensive resuscitation. The purpose of this clinical study is to classify the radiologic pulmonary appearances of the patients suffering from acute CO poisoning, and also to elucidate the incidence and the possible mechanisms to develop pulmonary edema.

Materials and Methods

This series consists of 61 patients suffering from severe acute CO poisoning who were admitted to the respiratory care unit during these 2 years. There were 18 males and 43 females, ranging in age from 1 to 60 (average 28.1). The source of CO was city (coal) gas in 60 patients, and incomplete combustion from fire in 1 patient. The composition of city (coal) gas in Japan is shown in Table 1. Suicidal attempts accounted for 38 patients, occupational or accidental for 22 patients, and remaining one was unknown. All patients were comatose or semicomatose at the time of admission.
Fig. 1a and b. Chest radiograms of a fully recovered patient. "Ground glass density" on admission (a) disappeared after the first hyperbaric oxygen therapy (b)