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### A study of acute carbon monoxide poisoning cases by charcoal-based kotatsu (a Japanese foot warmer)

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**Objective:** To elucidate the occurrence factors, as well as the presence or absence of sequelae in acute carbon monoxide (CO) poisoning caused by charcoal-based kotatsu, which is a kind of coffee table equipped with a heater to keep your legs and feet warm that is traditionally used in the winter in Japan.(1)

**Methods:** The subjects included patients treated for acute CO poisoning caused by use of a charcoal-based kotatsu between April 2017 and February 2018. We recorded the estimated CO exposure time, the patient's position at the time of discovery, presence or absence of consciousness, percutaneous concentration of carbon monoxide (SpCO) and concentration of carbon monoxide (CO-Hb) measured on arrival at the medical institution, presence or absence of hyperbaric oxygen therapy, head CT / MRI findings, presence or absence of sequelae, and reasons for using a charcoal-based kotatsu.

**Results:** Six patients, two males and four females, met the criteria for this study. Their mean age was 79.5 years. Estimated exposure time was calculated for three of the subjects, with an average length of 316 minutes. Regarding position at the time of discovery, two subjects had their full body under the kotatsu, whereas the other four subjects had only their legs underneath. The average SpCO level was 24.8%, and that for CO-Hb was 19.2%. Five subjects were unconscious at the time of discovery, on whom hyperbaric oxygen therapy was performed; the remaining subject was excluded due to having drunk alcohol and vomiting. All subjects survived; however, the two subjects who had exposed their whole body to CO had abnormal findings in head CT or MRI. In addition, those subjects exhibited prolonged consciousness disturbance or delayed encephalopathy. In all subjects, the reasons for using charcoal-based kotatsu were that it was inexpensive, and elderly people traditionally tended to use it for a long time without upgrading to an electricity-based version.

**Conclusion:** This study suggests the possibility that the risk of prolonged consciousness disturbance or delayed encephalopathy is high in cases of whole body CO exposure caused by use of a charcoal-based kotatsu.

#### References:

(1) Nakamura T, Setsu K, Takahashi T, et al. Chronic exposure to carbon monoxide in two elderly patients using a kotatsu, a traditional Japanese charcoal-based heater. *Psychogeriatrics*. 2016 16:323-6.