

Kasuistiken/Casuistries

Homicidal and Camouflaged Carbon Monoxide Poisoning in Japan

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Summary. There were 1,985 fatal cases of CO poisoning in the Tōhoku district of Japan in the period from 1969 to 1980. Among them, 1,322 cases were suicidal, 662 accidental, and one homicidal, in which a man killed his wife with the self-made CO gas to obtain by fraud a large amount of life insurance. Our nationwide survey revealed four other cases of homicidal CO poisoning and two cases of camouflaged CO poisoning. The police and police surgeons should be cautious enough in cases of CO poisoning.

Key word: Carbon monoxide poisoning, homicidal CO poisoning

Zusammenfassung. Im Distrikt von Tōhoku/Japan wurden von 1969 bis 1980 1985 tödliche Kohlenmonoxidvergiftungen ermittelt. Dabei handelte es sich in 1322 Fällen um Selbstmord, in 662 Fällen um Unfall und in einem Fall um Mord. Ein Mann hatte seine Frau mit selbsthergestelltem Kohlenmonoxidgas getötet, um eine hohe Lebensversicherungssumme zu erhalten. Unser Überblick zeigt, daß in ganz Japan vier weitere Fälle von Mord durch CO und noch zwei Fälle von vorgetäuschter CO-Vergiftung bekannt geworden sind. Der Polizei und dem Leichenschauer ist sorgfältiges Vorgehen bei Verdacht einer CO-Vergiftung zu empfehlen.

Schlüsselwort: Kohlenmonoxidvergiftung, Mord

Introduction

Carbon monoxide (CO) poisoning is obviously increasing in parallel with the advance of civilization. We have, however, no detailed nationwide statistics of fatal cases of CO poisoning in Japan. In recent years, therefore, we have been making a thorough investigation into accidental and suicidal cases of CO poisoning and

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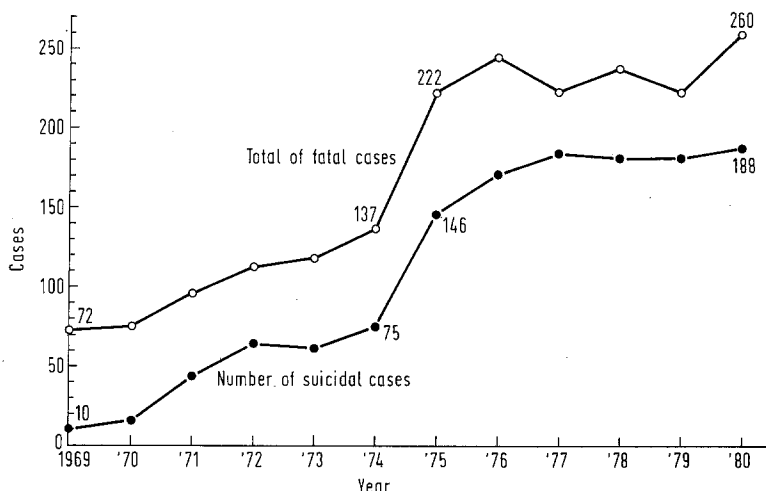


Fig. 1. Secular trend of fatal CO poisoning in the Tōhoku District of Japan (1969–1980)

sources of lethal CO in the Tōhoku (north-eastern) district of Japan, which were confirmed by the police and the departments of legal medicine in the district. This investigation has been made yearly through the Tōhoku Regional Police Bureau and the corpse examiner (Deputy chief of the first investigation section) of each Prefectural Police Headquarters. In this survey, CO poisoning in cases of death by fire is excluded.

It is not the main subject of this paper to report the above data in detail, and only the outline is shown in Fig. 1 and Table 1. In Fig. 1, the upper line depicts the number of all fatal cases of CO poisoning in each year in the period from 1969 to 1980, and the lower line depicts the number of suicidal cases among them. As shown in this figure, the abrupt increase in the number of all fatal cases in 1975 is due to that in the number of suicidal cases caused by the first 'oil shock', and it is noticeable that the number of accidental cases between the two lines has been almost stationary with some fluctuation in spite of the social education and the strengthened regulations for control of combustion equipments and dealers concerned.

On the other hand, Table 1 shows that the exhaust gas of cars is the first source of lethal CO and the city gas is the second.

On the whole, among 1,985 fatal cases, 1,322 (66.6%) were suicidal and 662 (33.4%) accidental. In addition, there happened a rare homicidal case in Yamagata Prefecture in 1973.

To compare the above result with that in the southern district, we asked in 1975 Mr. Y. Asakura, the then corpse examiner of the Hyōgo Prefectural Police Headquarters, to survey the fatal cases of CO poisoning in Hyōgo Prefecture in the period from 1969 to 1974 in the same way as in the Tōhoku district (Table 2). It is noticeable that in the Hyōgo Prefecture with a population of about half that of the Tōhoku district, the total of fatal cases of CO poisoning was contrarily over twice that of the Tōhoku district, and accidental and suicidal cases were more frequent in the Tōhoku district and Hyogo Prefecture, respectively. In short, CO poisoning in

Table 1. Sources of lethal CO in the Tōhoku District of Japan (1969–1980)

Prefectures	Sources									Total
	Car	City gas	Ko-tatsu ^a	Bath-room	Gas and oil stove	Kitchen range	Brazier	Instantaneous water heater	Others	
Aomori	145	35	12	5	12	11	2		10	232
Akita	141	99	14	22	43	21	3		1	344
Iwate	157	22	44	10	4	24	8		3	272
Yamagata	135	32	18	6	4	3	2		34	234
Miyagi	166	147	72	29	11	7	11	5	3	451
Fukushima	217	80	80	18	16	24	6	1	15	452
Total	956 (48%)	415 (21%)	240 (12%)	90 (5%)	90 (5%)	90 (5%)	32 (2%)	6 (0.3%)	66 (3%)	1,985

^a A briquet or charcoal foot warmer covered with a quilt

Table 2. Fatal cases of CO poisoning in the Tōhoku District and the Hyōgo Prefecture (1969–1974)

	Population (1971)	Total of fatal cases	Number of suicidal cases	Number of accidental cases	Number of homicidal case	The first cause	The second cause	The third cause
Tōhoku District	9,008,000	610	270 (44%)	339 (56%)	1 (Case 4)	City gas (35%)	Car (22%)	Kotatsu (21%)
Hyōgo Prefecture	4,665,000	1,347	1,103 (82%)	243 (18%)	1 (Case 1)	City gas (85%)	Car (5%)	Stove (3%)

the Tōhoku district is of rural type and that in the Hyōgo Prefecture is of urban type on the whole.

The homicidal cases in the Hyōgo and Yamagata Prefectures will be described in detail later as cases 1 and 4, respectively. As far as we know, the latter may be the first homicidal case in the world from the viewpoint of self-made CO gas. Not only the police but also we were surprised to learn that such a case happened in the most serene and peaceful district in Japan. Stimulated by this astonishing case, we surveyed cases of homicidal and camouflaged CO poisoning in 1975 with the help of the corpse examiners of all prefectures in Japan. Here, "homicidal CO poisoning" means that the direct cause of death was CO poisoning intended by another person, and "camouflaged CO poisoning" means that the victim was killed by means other than CO and thereafter CO poisoning was pretended. The cases obtained were as follows.

Case Report

Homicidal CO Poisoning

Case 1. On January 19, 1970, a man aged 33 was found dead alone in bed, and his paramour aged 31 with whom he had lived together was missing. The hose of the gas stove was found off, and city gas was being discharged into the room. The constricting metal ring of the hose was found on the floor near the hose. Autopsy revealed the cause of death to be CO poisoning, and at first an accidental death was suspected. However, the ring was difficult to come off spontaneously, and his paramour was suspected and arrested. She confessed that he had suggested her to dissolve their cohabitation. So, while he was sleeping, she took off the hose from the stove, discharged the city gas into the room, and ran away. She was sentenced to 8 years' penal servitude.

Case 2. On March 15, 1970, the decomposed corpse of a hostess aged 25 was found in the supine position on the kitchen floor, and the postmortem interval was estimated to be about 10 days. The gas stove was found turned over, the hose had been cut off and the stopcock had been shut. Autopsy revealed the cause of death to be CO poisoning (CO-Hb, 81%). The man, who had been cohabiting with her, confessed that he had stuffed the gas hose into her mouth while she was sleeping with her mouth open until she died, and ran away. He was sentenced to 8 years' penal servitude.

Case 3. On November 14, 1973, it was reported to the police that a man aged 38, who was a chronic alcoholic living alone, was found dead in the water of his bathtub. The lividity was bright cherry-red, and autopsy revealed the cause of death to be CO-poisoning (CO-Hb, 69%). However, the bath furnace had been equipped outside the bathroom and the possibility of CO poisoning while bathing, which is not rare in Japan, was not conceivable. Furthermore, marks of ligature were found on the arms and legs. The police inquiries revealed that the day before the victim's sister, who had been looking after him at times, found him behaving violently in the house and informed her brother aged 25 and brothers-in-law aged 43 and 40. They tied the extremities of the victim with ropes and put him onto the rear seat of their car. They intended to drive him to the police or the mental hospital. On their way, he began to rampage again. So, they stuffed him into the boot and shut down the boot-lid. Then, they induced the exhaust gas into the boot through a small hole for fixation of spare tire with a vinyl hose for about 30 min. During this time, they were praying with folded hands. Thereafter, they carried the corpse to his house and assumed the appearance of drowning in the bathtub.

The three brothers were all sentenced to 3 years in prison.

Case 4. Early in the morning of March 20, 1973, a farmer aged 46, living in the suburbs of Yamagata City, asked the ambulance station by telephone for help for his wife aged 43, whom he had found dying in the greenhouse. When the ambulance arrived, she had been carried to bed and had already died, and the greenhouse was being heated with two pieces of briquet. Postmortem examination by the police and the police surgeon revealed nothing suspicious, and they considered the cause of death to be accidental CO poisoning, and no autopsy was made.

Three months later, the inspector of the ministry of postal services became suspicious about the large amount of her insurance amounting to 80,240,710 yen in case of accident, i.e., about US\$ 300,000, which was obviously excessive and was being drawn bit by bit at Yamagata City and six other distant cities. This amount had already been paid to the husband.

The police investigation over several months revealed that before the accident the husband had been deeply indebted because of heavy losses on the stock market, and that he had purchased sulphuric acid, oxalic acid, caustic soda, flasks, glass tubes, etc. from several chemist shops using false names. The handwriting was identified as that of the suspect, and the fingerprints were detected on some sale bills. In addition, it was revealed that a man, apparently the suspect, visited the Dept. of Chemistry, Yamagata University School of Science, and asked the staff how to deodorize CO gas in the autumn of 1972.

The suspect was arrested and readily confessed his crime. His confession is very interesting as follows:

To pay off his debts and to obtain further funds to speculate on the stock market, he intended to get the money by fraud. Then he took out numerous life insurances on his wife at nine post offices in the period from January 27 to February 22, 1972.

To our extreme surprise, he read a second-hand textbook of legal medicine to study how to kill her without incurring suspicion and reached the conclusion that CO poisoning would be the best. Then, he read a textbook of chemistry and tried to get sulphuric acid and formic acid. However, the formic acid was not on the market. He studied again and learnt that boiling of the mixture of sulphuric acid and oxalic acid produces CO and CO₂ in 50% each. Then, he studied how to remove CO₂, and learnt that it can be removed through the solution of caustic soda. Thereafter, he purchased the materials and instruments 15 times and repeated the chemical experiment in the barn. In the long run, he succeeded in producing very dense CO gas. When he tested the smell of the gas, he almost lost consciousness and fell down for a while. Some days later, he visited the Dept. of Chemistry, Yamagata University, and asked the staff how to deodorize the gas, but he failed to get a satisfying answer. So, he purchased a deodorant on the market, and succeeded in deodorizing the gas. Then, he caught a rat and confirmed the toxicity of the gas. The rat died within a moment when he put it into the bag. Finally, he collected the gas into a large agricultural polyethylene bag, and deodorized the gas with two pieces of deodorant, which were taken out later on. Then he marked the bag with "CO" in magic ink. Besides, he prepared another bag, filled with air, which he marked with nothing. And he placed the two bags between the double doors of the greenhouse. He had prepared two face masks, one for each bag, in advance.

At midnight of the following day, he woke up his wife and urged her to go to the greenhouse with him to check up on the heating. Just before she entered the greenhouse, he warned her of the danger of CO gas from the briquet and urged her to imitate him. First, he connected the bag full of air to his mask, and untied the string. Then he made her connect another bag to her mask and untied the string of the bag.

When she entered the greenhouse two or three steps, she fell down and did not move at all. To our surprise, according to his confession, he removed her mask and bag soon after she collapsed, because he was afraid that he would be suspected if autopsy revealed a high difference between CO-Hb of the victim and the concentration of CO in the air of the greenhouse. About 1 h later, he carried the corpse into the bedroom, and phoned the ambulance station as stated previously.

To sum up, he intended a perfect crime, and even the police could not see through his ingenious scheme at first. Even if a medicolegist had attended the scene, we think he probably would not have easily penetrated into his deception either and would have assumed the cause of death to be accidental CO poisoning as diagnosed by the police surgeon. Fortunately, this case was solved on account of the large amount of the life insurance.

The police made a domiciliary search and discovered the evidence, such as the polyethylene bag marked with "CO", the seals which were used when he bought the chemical materials under his own name at first and thereafter under a false name, gas detector tubes, face masks, and so on. Intending a perfect crime, he had made serious errors.

The public prosecutor concerned requested us to examine experimentally whether or not such a dense CO gas could be produced by the process as confessed by the suspect and whether the gas could be lethal in such a short time as stated by the suspect. The scheme of the experiment by the suspect was principally the same as shown in the textbook of chemistry, and our experiments demonstrated that there is nothing doubtful in his confession. The inspection of evidence at the scene suggested that the victim fell down about 3 s after she inspired the gas in the bag. Theoretically, it is known that such a dense CO gas as 50% or more is lethal within a few seconds. On the other hand, the chemical experiments by the Identification Section of the Yamagata Prefectural Police Headquarters proved that the concentration of CO in the gas made according to the suspect's confession was about 80%.

After all, the suspect was brought to justice, judged guilty, and sentenced to life imprisonment. He did not appeal against the decision.

In Japan, CO poisoning is probably the second most frequent accident next to traffic accidents, and it is increasing year by year. Besides, several cases of murder with CO have been detected as presented in this paper. However, in these cases city gas was used. Accordingly, this case is the first one using the self-made CO gas in Japan, and, as far as we know, it may be the first case in the world. Furthermore, it is quite surprising that such an ingenious crime was planned

and carried out by a farmer who graduated from agricultural school only. Since this case, the life insurance has been checked up in any fatal case of CO poisoning in Japan.

Case 5 [1]. On February 5, 1978, a bachelor aged 37 was found dead in his room. The stopcock of the gas pipe had been turned on, and the room was filled with city gas. At first, an accidental death by CO poisoning was presumed. Police investigation revealed that he had a drunken brawl with someone and a policeman settled the quarrel on the previous night. Autopsy revealed CO-Hb to be 78% and the blood alcohol content to be 0.19%. After all, the suspect confessed as follows: After the quarrel mentioned above, he dropped in the victim's room and found the victim sleeping with legs into kotatsu (an electric foot warmer). So, he turned on the stopcock of gas pipe and ran away with a transistor radio of the victim. He was sentenced to 8 years' penal servitude.

Camouflaged CO Poisoning

Case 6. On March 21, 1953, it was reported to the police that an idiotic girl aged 21 was found dead with her head into the kotatsu, a charcoal foot warmer with a coverlet. The policeman found small excoriations on the neck, of which her mother aged 57 explained that she had a habit to scratch the neck with fingernails. Two police surgeons detected no petechiae on the conjunctivae and presumed the cause of death to be CO poisoning. Thereafter, according to the rumor, re-examination was made just before the cremation. Many petechiae were found on the conjunctivae, and CO-Hb was negative in the heart blood. Autopsy revealed the cause of death to be "asphyxia" by throttling.

The confession of the victim's brother aged 34 was as follows: She abused him in foul language, and so he pushed her down and killed her by throttling and mugging her neck. Then, he put her head into the kotatsu, assuming the appearance of CO poisoning, and went out. At the evening meal, the mother found her dead.

In this case, it seems that the two police surgeons did not reverse the eyelids enough.

Case 7. On January 31, 1971, a woman aged 36, formerly a hostess of some cabaret, was found dead on the bed. The door had been locked and the door-chain had been put on. The lower part of the body was naked. The lock of the pilot burner of an instantaneous water heater was open and the room was full of city gas, and an accidental CO poisoning was presumed. Autopsy revealed, however, that CO-Hb was negative and the cause of death was "asphyxia" by throttling.

On the night of the same day, the man aged 31, who was cohabiting with the victim, turned up on the scene and was inquired by the police. He confessed as follows: He had represented himself to be a detective of the Metropolitan Police and was cohabiting with her. After a while, she perceived his lie, and on the night of her death she rejected sexual intercourse. Therefore, he killed her by throttling her neck with both hands. After camouflaging as mentioned above, he locked the door and escaped through the window. He was sentenced to 9 years' penal servitude.

Discussion

The Tōhoku district of Japan consists of six prefectures; the area occupies about 18% and the population about 8.2% of all Japan (1979). This district is situated in the northeast of the mainland of Japan, and the ambient temperature is lower in general than in the southern districts. So, heating is used longer in the cold season. Fatal cases of CO poisoning, however, seem to be more frequent in the southern districts rather than in the northern districts as speculated from Table 2.

On the other hand, according to the Vital Statistics of Japan in 1974 [2], the numbers of fatal CO poisoning are described as follows:

Accidental poisoning by carbon monoxide from incomplete combustion of domestic fuels (E874): 256.

Accidental poisoning by other carbon monoxide (E875): 13.

Poisoning by gases in domestic use, undetermined whether accidentally or purposely inflicted (E981): 45.

There were, however, 62 cases concerning E874 and E875 in the Tōhoku district and 41 cases in the Hyōgo Prefecture in the same year. So, the Vital Statistics may be unreliable at least in regard to fatal cases of accidental CO poisoning. Furthermore, cases of homicidal or camouflaged CO poisoning have not been described in the Vital Statistics before, but they have really existed in Japan as already mentioned. These cases include only those that were detected and confirmed by the police. In reality, some other cases of suspected homicidal CO poisoning, which had been dealt with as accident some years ago, are recently known. It is not clear whether these cases are included in E981 mentioned above.

On the other hand, Prof. Dr. Georg Schmidt, Institute of Legal Medicine, University of Heidelberg (FRG), was so kind as to inform us of the literature concerned and to advise us to publish this paper. Abstracts of cases in the literature were as follows:

Dolenc [3] described that it is sometimes difficult to discern whether the death from CO poisoning in the car within a garage is suicidal or accidental, mentioning the following two cases: (1) A married man and his lover were found dead from CO poisoning by the man's wife in the car within the closed garage. (2) A professional car driver aged 23 and a woman aged 27 were intoxicated with CO in the garage. In a state of mental derangement, he dragged her out of the car and laid her down on the ground. On the next day, she was found dead by a passerby. He recovered consciousness in the ambulance car, and complained to the doctor of tinnitus, confusion, and headache. Autopsy of the victim revealed 60% CO-Hb, aspiration of the stomach content into the trachea, and expansion of the lung. After a long trial, he was acquitted of the charge on the basis of the expert opinion.

Dutra [4] reported of a young man who put kantharidin into the drink of a girl. While driving his car, she lost consciousness, and so he induced the exhaust gas into the car to pretend an accident due to exhaust gas, and she died. He parked near the police station, pretended to have lost his consciousness, and fell down from the car. Blood examination revealed toxic and low concentrations of CO-Hb in her and his blood, respectively. He confessed his crime.

Verburt [5] reported of a man who induced the exhaust gas through a floor hole of the bed room with a metal pipe from the garage, intending to kill his wife and daughter. He confessed his crime.

Lewin [6] reported of a man who intoxicated his wife with opium and induced city gas into the room through the gas pipe injured intentionally. The doctor, who made the postmortem, believed in gas intoxication, but autopsy revealed nothing. The identification of traces of opium on the pillow led the man to confess his crime.

To learn something about the combined case of CO poisoning and homicide, we have referred to Medline, into which over 1,451,100 papers from 2,686 world-wide medical journals in the period from 1976 to 1981 have been included. The output result was as follows: papers concerning CO poisoning 395, those concerning homicide 557, and the combination of both only two [7, 8]. These two papers, however, are not concerned with homicidal CO poisoning itself. After all, we failed to find out such a case in recent years. It may well be so, because practical cases of CO poisoning and those of homicide have rarely been reported even in

medico-legal journals. Reuter [9] reported in 1958 extensively on some cases of homicidal poisoning by CO, also those described by Holzer and Laves [10]. Weimann [11] mentioned other cases and Holzer [12], too, described one case of murder and one of attempted murder.

As mentioned above, Dolenc [3] stated that it is difficult to determine whether each case of CO poisoning in a garage is suicidal or accidental. Far from that, it is more difficult to distinguish between accidental and homicidal CO poisoning, and the consequence in case of misjudgment is more serious than taking accident for suicide and vice versa. Accordingly, the Investigation Section of the police is desired to deal deliberately enough with cases of CO poisoning in co-operation with the Identification Section and the Department of Legal Medicine lest any homicidal case should be overlooked. This situation would be common throughout the world because the Japanese are not particularly more clever or crafty than other people.

In addition, it is evident that there are much more cases of non-fatal accidental CO poisoning than those of fatal accident because of the recent remarkable improvement in airtightness of house and the wide spread of oil and gas heaters. The public health authorities should therefore make administrative efforts to decrease cases of CO poisoning.

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