Burning Charcoal: An Indigenous Method of Committing Suicide in Hong Kong

Chi Ming Leung, M.R.C.Psych.; Wai Sau D. Chung, M.R.C.Psych.; and Eddie P. M. So, F.R.A.N.Z.C.P.

Background: Carbon monoxide (CO) poisoning by burning charcoal has become one of the most common ways of committing suicide in Hong Kong since late 1998. The evolution of the phenomenon was explored in the current study.

Method: Information about completed suicides between January 1996 and December 1999 was obtained from the Hong Kong death registry and hospital authority, and information about ambient temperature and humidity was obtained from the Hong Kong Observatory. News on completed suicides by burning charcoal was collected by computer search using the data bank of 6 major Hong Kong newspapers. The data were analyzed.

Results: CO poisoning by burning charcoal rose from 0% of all Hong Kong suicides in 1996 and 1997 to 1.7% in 1998 and 10.1% in 1999. The monthly incidence rate bore a reciprocal relationship with the ambient temperature. Suicidal pacts were overrepresented, and past history of mental illness was uncommon. Both demographic and clinical features of suicides by burning charcoal resembled those of suicides by domestic gas poisoning. The overall suicide rate remained unchanged in the above period.

Conclusion: Suicide by burning charcoal is a new variant of domestic gas poisoning. A host of biopsychosocial and ethnological factors are responsible for the birth and indigenization of the method.

(J Clin Psychiatry 2002;63:447–450)

Received April 6, 2001; accepted Nov. 15, 2001. *From the Department of Psychiatry, the Chinese University of Hong Kong (Drs. Leung and Chung), and the Department of Psychiatry, Tai Po Hospital (Dr. So), Hong Kong, China.*

The authors report no financial affiliation or other relationship relevant to the subject matter in this article.

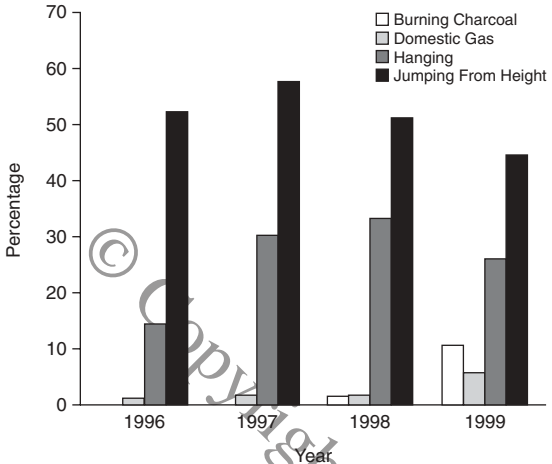
Corresponding author and reprints: Chi Ming Leung, M.R.C.Psych., Department of Psychiatry, the Chinese University of Hong Kong, 11/F, Prince of Wales Hospital, Shatin, Hong Kong, China (e-mail: cmleung@ha.org.hk).

Committing suicide with carbon monoxide (CO) poisoning is a de novo invention compared with other traditional methods such as hanging and drug poisoning. The origination of the method coincided with industrialization, first as domestic gas when domestic gas supply became available[1] and then as car exhaust with an incidence rate in direct proportion to the increasing availability of private motor vehicles.[2,3] Efforts to cut the CO content of domestic gas and car exhaust have resulted in variable effects on suicide rate.[1,2,4] While accidental CO poisoning with faulty heating systems is common, committing suicide by burning charcoal was not described in the literature until it was first reported in Hong Kong.[5] The first incident of suicide by burning charcoal took place locally in November 1998 and was followed by a series of similar acts. Between January 1996 and October 1998, CO poisoning by domestic gas constituted merely 1.6% of total local suicides.[6] However, preliminary investigations showed that suicide by means of burning charcoal constituted about one tenth of local suicides in the last 2 months of 1998.[7] The current article reports a follow-up study on the evolution of a phenomenon that has so far remained local. The relationship with seasonal temperature and humidity is also explored, as this suicide method is associated with the generation of much heat and the first cases appeared in winter.

METHOD

The data about completed suicides by different methods including burning charcoal between January 1, 1996, and December 31, 1999, were obtained from the Hong Kong death registry and hospital authority. Computer search into the data bank of 6 major Hong Kong news papers (Hong Kong News Bot), using the keywords *burning charcoal* and *suicide*, was used to collect news on completed suicides by burning charcoal. The mean monthly ambient temperature and humidity between January 1996 and December 1999 were obtained from the Hong Kong Observatory. The data on suicides from 1996 to 1999 were analyzed and compared using the Statistical Package for the Social Sciences, version 9.0 (SPSS, Inc. Chicago, Ill.).

Figure 1. Distribution of Popular Methods of Suicide in Hong Kong, 1996–1999



RESULTS

A total of 2284 completed suicides occurred in Hong Kong between January 1, 1996, and October 31, 1998, as recorded by the death registry. The suicide rates per 100,000 population were 12.6 (1996), 12.0 (1997), and 12.8 (1998) (12.6 for 1998 up to October 31). There was no significant difference in suicide methods used and no significant difference among the suicide methods in distribution of age and sex in these 3 years (January 1, 1996–October 31, 1998). The main categories included jumping from height (54.1%), hanging (31.6%), drug poisoning (5.3%), drowning (3.3%), and domestic gas poisoning (1.6%). The mean ages at death (in years) for each of the methods were as follows: jumping from height, 47.2; hanging, 55.1; drug poisoning, 51.4; drowning, 56.4; and domestic gas poisoning, 36.7. Male-to-female sex ratios were as follows: jumping from height, 1.4; hanging, 2.0; drug poisoning, 1.1; drowning, 1.0; and domestic gas poisoning, 3.3 to 1. Three individuals died of CO poisoning by car exhaust inhalation. There were 2 completed suicide pacts in these 3 years; 1 in 1997 by jumping from height and 1 in 1998 by drowning.

In 1999, a total of 882 completed suicides were recorded, including jumping from height (44.8%), hanging (26.0%), drug poisoning (4.9%), drowning (2.1%), and CO poisoning (15.4%), of which 10.1% was by burning charcoal and 5.3%, by domestic gas. One person died of CO poisoning by car exhaust. The overall suicide rate was 12.6 per 100,000 population. There were a total of 8 completed suicide pacts, of which 6 involved burning charcoal and 2, jumping from height. When compared with that of previous years, the percentage of suicide by jumping and hanging decreased significantly ($p < .005$), while that of CO poisoning, by both burning charcoal and domestic gas, increased substantially and significantly ($p < .000$). Figure 1 shows the distribution of popular methods of suicide between 1996 and 1999.

There were a total of 104 suicides due to CO poisoning by means of burning charcoal recorded between November 1998, when such a case was first reported, and December 1999, with 15 cases in 1998 and 89 cases in 1999. The mean age at death was 38.7 years (range, 20–65 years), which was significantly younger than that of other modes of suicide ($p < .001$) but similar to that of domestic gas poisoning. The male:female sex ratio was 2.3:1, which differed significantly from that of other methods ($p < .05$), with the exception of domestic gas poisoning and hanging.

During the same period, 9 of 104 suicides by burning charcoal were suicide pacts. All occurred in 1999, with the first in March 1999. Six pacts were completed, each involving a male-female couple, and all died in the incidents. One such pact was treated as suicide-homicide; the couple committed suicide and killed their 2 children by burning charcoal. There was no significant age difference between the pact and non-pact suicide victims ($p > .05$). The other 3 pacts, each involving 2 members, were incomplete, as one member died while the other survived.

Thirteen suicides (12.5%) by burning charcoal occurred at motels or in a resort. Nine (8.7%) of 13 cases took place in a resort island, an overrepresented group in terms of geographical distribution when compared with suicides by other methods ($p < .0001$).

Eight (7.7%) of 104 individuals who committed suicide by burning charcoal had a past history of mental illness. This percentage was significantly lower in comparison to that of non–burning charcoal cases (25.1%; $p < .0001$), while not significantly different from that of domestic gas poisoning cases (12.5%; $p > .05$).

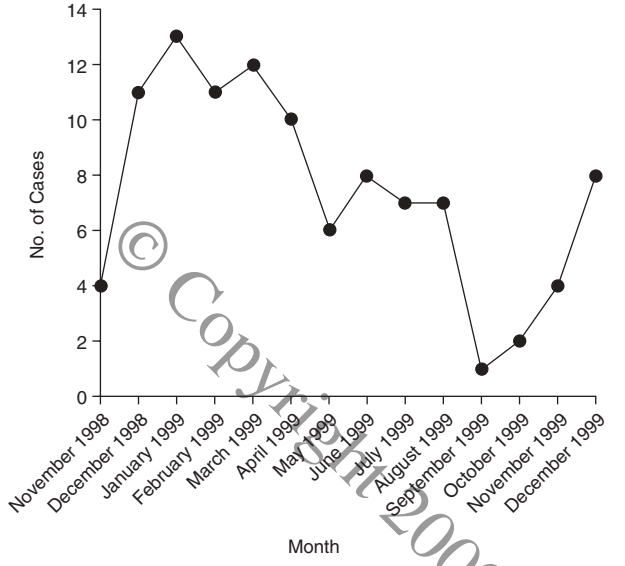
Figure 2 shows the incidence rate of suicides by burning charcoal according to month. The incidence climbed steeply after its debut in November 1998 and reached a peak in December 1998/January 1999, then returned to lower levels in the following months before a second peak in December 1999.

The incidence of suicide by burning charcoal showed a strong inverse relationship with the mean monthly ambient temperature [burning charcoal = −3.97 + 257.36 (1/temperature); $R^2 = 0.363$, $p < .02$]. No other suicide methods, including domestic gas poisoning, bore a similar relationship. Suicide by jumping from height and hanging was associated positively with humidity; Pearson coefficients = 0.54 and 0.37, respectively; $p < .01$ for both.

DISCUSSION

The first case of suicide by burning charcoal in late 1998 was initially thought of as an isolated and idiosyncratic event. When serial cases appeared in the subsequent months, their occurrence was treated as a copycat

Figure 2. Suicide by Burning Charcoal in Hong Kong According to Month, November 1998–December 1999



phenomenon.[7,8] The incidence of suicides by this method dropped during the hot and humid summer of 1999. However, its return in November of the same year signaled the arrival of an indigenous suicide innovation.

In Western societies, CO poisoning with domestic gas had at one time been very popular until the agent was detoxified in the 1960s.[1] However, CO poisoning as a suicide method did not disappear. Car exhaust became the prevalent CO poisoning method when motor vehicles became widely available to the average family and is now among the most common suicide methods in several developed countries, e.g., Australia.[3] In Hong Kong, because the number of vehicles per capita has remained low at 5%,[9] suicide by exhaust fumes is correspondingly rare.[2] However, although domestic gas supply is available to most households, suicide by domestic gas poisoning has also been rare.[6]

The current study shows that individuals who committed suicide by burning charcoal have a compatible sex ratio, similar age group, and a low rate for past history of mental illness in comparison to those who committed suicide by domestic gas poisoning, suggesting that the former is a variant of the latter. A typical victim would be a 40-year-old demoralized Chinese man or woman overcome by a relationship or financial problem who, after much thought and planning, chooses to die alone in a quiet or remote place, if not a resort house, and wishes to leave his or her body intact at death, unlike those who die by jumping or hanging.[5] This new variant, burning charcoal, is deemed superior to domestic gas poisoning by being odorless and posing no risk of explosion, which may account for the popularity of the method.[5] Furthermore, it is portable and could be set up in any indoor location, and charcoal is readily available at local shops.

The burning charcoal method is also ideal for pact suicide.[10] The act itself has a romantic connotation, with the couple lying close together or holding onto each other and awaiting their painless death. Other individuals incorporate cultural rituals and practices of homage, e.g., burning paper money and other burial items with the charcoal, allegorically enacting their own funeral, and asking for pardon from gods and deities so as to facilitate their transit into the next world. These features might also explain why burning charcoal was practiced in the suicide-homicide case in which parents took their small children with them to the grave.[11]

Apart from psychosocial factors, ambient temperature was shown to have a significant impact on the incidence of suicide by burning charcoal, a rather unique phenomenon.[12,13] Although the explanation is self-evident, the role of temperature must be relative, since Hong Kong, with an average temperature of 23 °C (73 °F), is never cold by any standard and is not an ideal place for the birth of such a method of suicide, whereas in northern China, although people keep warm in winter by burning coal under their stone beds, no such means of self-harm has ever been reported.

The emergence of burning charcoal as a way to take one's life illustrates the process of how an indigenous suicide method comes into being. The use of charcoal is an age-old domestic practice. Accidental deaths from CO poisoning secondary to faulty heating systems are well known.[14] In Hong Kong, charcoal is now used mainly in barbecue fires. How it has evolved into a lethal tool remains obscure, although the evolution of the method could well just be accidental, like many discoveries or inventions. However, propagated by extensive media coverage and sensational newspaper photographs, burning charcoal, with its advantages over other suicide methods, takes on a life of its own and makes an unprecedented impact on the vulnerable mind.[15–17] Although suicide by burning charcoal has remained localized, the psychosocial and ethnological principles underlying the etiology and evolution of the phenomenon could be applicable to other cultures.

Besides the rise in suicide deaths by burning charcoal, a concomitant rise in suicide deaths by domestic gas poisoning occurred in 1999, lending further evidence to the possibility that the traditional and the new methods of killing oneself with CO are variants of the same phenomenon. However, the overall suicide rate did not change significantly, since the rise in CO poisoning suicides was compensated for by a fall in both jumping and hanging suicides. This finding tends to support the theory that new methods replace old ones without adding to the incidence of suicide.[3]

The ease of accessibility and lethality of the method make prevention difficult. Effective strategy should curtail

sensational reports,[18–20] consider the role of the media, and publicize the availability and accessibility of crisis services.[21]

Although uniquely capturing the birth and evolution of a new suicide method, the current study is limited by a short duration of follow-up and a lack of the exact details of each suicide. Suicide by multiple means further complicates the picture. A larger study is being planned to look further into the issue, with an aim to explore the psychopathology of victims and to test the hypotheses raised in the current article.

REFERENCES

1. Kreitman N. The coal gas story: United Kingdom suicide rates, 1960–1971. Br J Prev Soc Med 1976;30:86–93
2. Lester D, Frank ML. The use of motor vehicle exhaust for suicide and the availability of cars. Acta Psychiatr Scand 1989;79:238–240
3. Burvill PW. The changing pattern of suicide by gassing in Australia, 1910–1987: the role of natural gas and motor vehicles. Acta Psychiatr Scand 1990;81:178–184
4. World Health Organization. Changing Patterns in Suicide Behaviour: Report on a WHO Working Group. Copenhagen, Denmark: WHO Regional Office for Europe; 1981:1–45. EURO Reports and Studies, No. 74
5. Chung WS, Leung CM. Carbon monoxide poisoning as a new method of suicide in Hong Kong. Psychiatr Serv 2001;52:836–837
6. Coroner's Reports 1996, 1997, 1998, 1999. Hong Kong, China: Hong Kong Coroner's Office, Government of the Hong Kong Special Administrative Region; 1996–1999
7. Phillips DP. The influence of suggestion on suicide: substantive and theroretical implications of the Werther effect. Am Sociol Rev 1974;39:340–354
8. Jonas K. Modelling and suicide: a test of the Werther effect. Br J Soc Psychol 1992;31:295–306
9. Hong Kong in Figures. Hong Kong, China: Census and Statistics Dept, Government of the Hong Kong Special Administrative Region; 2000
10. Fishbain DA, Aldrich TE. Suicide pacts: international comparisons. J Clin Psychiatry 1985;46:11–15
11. Akaishi S, Oshida S, Hiraiwa K, et al. Homicidal and camouflaged carbon monoxide poisoning in Japan. Z Rechtsmed 1982;88:297–304
12. Preti A. The influence of climate on suicidal behaviour in Italy. Psychiatr Res 1998;78:9–19
13. Wang YT, Wang D, Wang XY. Suicide and meteorological factors in Huhhot, Inner Mongolia. Crisis 1997;18:115–117
14. Penny DG. Carbon Monoxide Toxicity. Boca Raton, Fla: CRC Press; 2000
15. Philips DP, Carstensen LL. Clustering of teenage suicides after television news stories about suicide. N Engl J Med 1986;315:685–689
16. Stack S. The effect of the media on suicide: evidence from Japan, 1955–1985. Suicide Life Threat Behav 1996;26:132–142
17. Gould MS. Suicide and the media. Ann N Y Acad Sci 2001;932:200–221
18. Etzersdorfer E, Sonneck G. Preventing suicide by influencing mass-media reporting: the Viennese experience 1980–1996. Arch Suicide Res 1998;4:67–74
19. Michel K, Frey C, Wyss K, et al. An exercise in improving suicide reporting in print media. Crisis 2000;21:71–79
20. Leenaars A, Cantor C, Connolly J, et al. Controlling the environment to prevent suicide: international perspectives. Can J Psychiatry 2000;45:639–644
21. Goldney RD. Suicide: the role of media. Aust N Z J Psychiatry 1989;23:30–34