Z Rechtsmed (1985) 95:51–57

Zeitschrift für
Rechtsmedizin
© Springer-Verlag 1985

Suicidal Fire Deaths Revisited

A. R. Copeland

Medical Examiner Department, 1050 NW 19th Street, Miami, FL 33136, USA

Summary. A study of self-immolation or suicidal fire deaths was performed on the case files of the Office of the Medical Examiner of Metropolitan Dade County in Miami, Florida, during the 8-year period from 1977 to 1984. A total of 24 cases, representing 0.96% of the suicides that occurred during this period, were collected and analyzed as to age, race, sex cause of death of the victim along with the blood alcohol content at autopsy, drugs detected at autopsy, and the terminal carboxyhemoglobin. Additionally, the scene circumstances, geographic location of the terminal incident, the reason for the suicide, whether or not there was a past suicide attempt, a past psychiatric history, how the fire was started, presence or absence of an outside example, time of occurrence, presence of hospitalization, and presence of a suicide note were also noted. Most of the victims were white women of over 50 years of age who died of thermal injuries. Half of the time the blood alcohol content was negative at autopsy, 1/3 of the time the drug screen was negative, and 1/3 of the time a small amount of carboxyhemoglobin was noted. Most fires originated at home, although motor vehicles were also common. Reasons for the suicide were varied. Of the cases 1/3 had a precious suicide attempt and approximately 1/2 of the cases had a psychiatric history. Commonly, the fire is started by pouring a flammable liquid on oneself as isopropyl (rubbing) alcohol or gasoline and igniting it. No outside media examples were noted. These events occurred more frequently in the afternoon or evening. Most were hospitalized and most did *not* leave a suicide note.

Key words: Self-immolation – Suicide, fire deaths – Burns, pathology and biology

Zusammenfassung. In der vorliegenden Studie wurden die Selbstmörder durch Feuertod während der Jahre 1977 bis 1984 untersucht. Vierundzwanzig Fälle bzw. 0.96% der Suizidrate während dieser Zeit wurden in bezug auf Alter, Rasse, Geschlecht, Todesursache, Blutalkoholgehalt Drogenanalyse und CO-Hämoglobin untersucht. Ebenfalls wurden der Tatort, die Örtlichkeit, der Grund für den Selbstmord, frühere Versuche, die psychia-

trische Anamnese, die Art der Brandlegung und die Tageszeit analysiert. In der Mehrzahl der Fälle handelt es sich um Weiße und zwar um alte Frauen mit negativem Blutalkohol, ein Drittel mit negativer Drogenanalyse und ein Drittel mit geringem CO-Gehalt. Das Feuer wurde im Hause oder im Auto gelegt. Die Gründe dafür waren verschieden. Es wurden in einem Drittel der Fälle frühere Versuche ermittelt. In der Hälfte der Fälle fand sich eine psychiatrische Geschichte vor.

Schlüsselwörter: Selbstmord, Feuertod – Tod durch Verbrennen

Self-immolation or suicide by burning oneself is rare in the United States. Given such a rarity, it behooves the forensic pathologist to study the event to understand and detect its occurrence. Research reports [1–5] are few and have tended toward anecdotal case reports. Accordingly, this study was performed to delineate the situational dynamics of self immolation as it occurs in a large urban area.

Material and Methods

Metropolitan Dade County is a growing community of 2,000 square miles and a 1980 population of approximately 1,600,000. The office of the Medical Examiner is empowered by statuatory law to investigate those deaths which occur within the county of a violent, unnatural, or unexpected means. Some 3,500 cases are investigated annually; about 2,800 cases of these are autopsied. For this study, all cases of self-immolation, or suicide by burning, that occurred from 1977 to 1984 were collected and analyzed as to age, race, and sex of the victim. The cases were also analyzed as to the cause of death of the victim, the blood alcohol content of the victim at autopsy, the carboxyhemoglobin at autopsy, the scene circumstances, the geographic location of the terminal incident, the reason for the suicide, whether there was a past suicide attempt or a past psychiatric history, how the fire started, whether there was an outside example, when the incident occurred, whether the victim was hospitalized, and whether a written suicide note was present. A total of 24 cases of 2,512 suicides (or 0.96%) that occurred during the 8-year period were studied.

Results

In reviewing the case files on these self immolation cases, a large amount of data was available. Some of these data are listed in the attached tables. Briefly, the age distribution is given in Table 1. Essentially, the majority of the victims are aged 50 years or more. Of these 24 cases, 22 were white and two were black; 18 were females and 6 were males.

The cause of death most frequently listed (17 cases) was multiple burns or extensive thermal injury. Occasionally, the terminology used was smoke inhalation (two cases), pneumonia due to thermal injury (two cases), contributory sharp force injury to the neck (one case), "self-immolation" (one case), or even the term "vehicular conflaguration" (one case).

Toxicologically, ten of the cases lacked a blood alcohol determination, 16 of the cases lacked a screen for drugs of abuse (e.g., a Urine EMIT® drug screen),

Table 1. Age distribution of the self-immolation victim

Age (years)	No. of cases
0–20	1
21–25	2
26–30	0
31–35	1
36–40	2
41–45	1
46–50	0
51–55	4
56–60	4
61–65	3
Over 65 years	6

Table 2. Scene circumstances

Scenario	No. of cases
Found on fire in home or apartment, not otherwise specified	6
Went to bathroom, set him-/herself on fire	4
Fire in motor vehicle, made no attempt to vacate	4
Went to field, vacant lot, set him-/herself on fire	2
Went to utility shed, got flammable liquid, ignited	2
Set bed on fire	2
Set him-/herself on fire, ran down hallway	1
Set him-/herself on fire, friend extinguished, brought to emergency room	1
Set him-/herself on fire, extinguished, went to local doctor	1
Unknown	1

and 14 of the cases lacked a carboxyhemoglobin determination. This reflects the large degree of emergency fire rescue intervention and/or hospitalization which would render such analyses useless. However, in the remaining cases, the blood alcohol content was negative in 12 cases and was within the range of 0.01% up to 0.1% in two cases. The Urine EMIT® drug screen (or other methods where indicated, such as radioimmunoassay (RIA) or gas chromatography) was negative in seven cases with one case having a positive for opiates, reflecting medical care. Carboxyhemoglobin, measured using a CO-oximeter, was negative in three cases and was within the range of 0 up to 20% in seven cases.

Tables 2–4 present the scene circumstances of the suicidal fire death. Essentially, these tables itemize the "final action" of the victim and the locations of these actions. Commonly, the victims set themselves on fire at home; however, motor vehicles are also common (Tables 2, 3). Table 4 gives the data on how the fire was started. Usually, a flammable liquid, such isopropyl (rubbing) alcohol or gasoline, is used.

Table 3. Geographic location of the terminal incident

Locale	No. of cases
Home (place of residence)	17
Specific area:	
Home, not otherwise specified	5
Bathroom	4
Bedroom	3
Dining room	1
Living room	1
Kitchen	1
Porch	1
Backyard	1
Motor vehicle	4
Vacant lot, open field	2
Hospital room (bathroom)	1

Table 4. How was the fire started?

How?	No. of cases
Poured flammable liquid on him-/herself, ignited	14
Specific liquid used:	
Rubbing alcohol (isopropyl)	7
Gasoline	5
Cleaning fluid, not otherwise specified	1
Perfume, not otherwise specified	1
Flammable liquid used in motor vehicle (containers found in wreckage), ignited	4
Specific liquid used:	
Gasoline	3
Lighter fluid	1
Poured flammable liquid on bed, ignited	1
Specific liquid used:	
Rubbing alcohol (isopropyl)	1
Flammable liquid on floor, ignited	1
Specific liquid used:	
Cleaning fluid	1
Set him-/herself on fire, not otherwise specified	1
Unknown	3

The reason for the suicide is an important consideration in any investigation or study. Here in Miami, Florida, it is common practice for the police and the medical examiner to ascertain why the persons may have wished to kill themselves. This information is obtained by interviewing witnesses, families, or friends of the victim along with a careful search of the premises for a note indi-

Table 5. Reason for the suicide

Reason	No. of cases
"Bored" or tired with life	2
Living in US, desire to return to native country	2
Marital problems	2
Felt rejected or not loved	2
Family and financial problems	1
Felt a "burden to children"	1
Recent paranoid behavior, not otherwise specified	1
Problems with children's immigration to US	1
Thought had a brain tumor	1
History of concocting lawsuits	1
Husband never home	1
Missed children who had been removed from home	1
Lack of ambulation and husband with cardiac condition	1
Parents separated, mother with cancer, physical scar	1
Psychiatric history, not otherwise specified	1
Depressed, not otherwise specified	1
Unknown	4

cating the nature of the actions. On the basis of these investigations, which are included in the medical examiner's case file, Table 5 gives the reasons for the suicide. Usually, a reason is apparent. In only four cases it was unknown.

Additional information concerning the victim was also evident in the case file. A past suicide attempt was apparent in seven cases, and ten cases had a history of past psychiatric care. Accordingly, the final death scenario is not surprising. Many of the victims (14 cases) performed this "death act" in the afternoon or the evening rather than in the morning. A suicide note was absent in 19 cases. Furthermore, in analyzing all the information available, an outside example (e.g., seeing someone burn himself on television or reading a report about this (e.g., Buddhist monks in Viet Nam) was not evident.

As alluded to earlier, most of the victims (20 cases) were hospitalized to some degree prior to their demise. Survival times were varied in this hospitalized group. Eleven persons died within 12 h of the incident, four died within 13–24 h, one died within 3–7 days, three died within 1–2 weeks, and one died within 1–2 months. Truly, a great deal of information is available on these victims in the case files of the medical examiner.

Discussion

Death by fire is a fascinating area of study from several aspects ranging from fire rescue intervention and emergency medical services to forensic investigation of the death and the origin of the fire. For the forensic pathologist, these cases are interesting and challenging. While the cause of death is usually self-

explanatory, the manner of death can be problematic since one must ascertain whether it is accidental, homicidal, or suicidal. It is with this latter manner of death that this paper concerns itself to categorize such fatalities. It is realized, however, that this study is limited in that only fatalities are studied. Those who attempt suicide by fire and ultimately survive are beyond the scope of this project. This latter population has been reported as large as 9% of modern university hospitals burn units' population [2]. Accordingly, this study confines itself to a very small group of people indeed.

Given the limitations of the study, several points of comparison and contrast can be made. First, as compared to earlier studies from this office over 20 years ago [1], one notes that the estimated percentage of suicide by self-immolation is approximately the same. This is interesting given the changes in society that have occurred in a 20-year period. Furthermore, comparing the scenarios involved in that case report [1] to this study, one sees a similarity in that flammable liquids used at home are a frequent method (Tables 2–4). However, the type of flammable liquid used has changed somewhat as kerosene use was not observed in this recent 8-year study (Table 4). The reason for the suicide (Table 5) and the psychiatric background of the individuals appear similar in both studies. This may well represent the psychologic make-up of the type of individual who would kill himself by fire. This latter point, however, is best discussed by clinicians and psychologists. It is beyond the realm of this study. One can conclude, however, that it is interesting to compare this phenomenon with earlier reports [1] from this office. Evidently, certain types of cases in forensic science are always noted. Yet, the real reason for the expression of suicide by self-immolation remains enigmatic.

Other comparisons are also noteworthy. As compared to accidental fire deaths [6] in the same population, suicide by fire is rare. Furthermore, accidental fire deaths frequently involve a bimodal age population of children and the elderly who are predominantly white males. This study (Table 1) indicates that suicidal fire deaths are more commonly in an older, white female population. While the home is the locale for the incident in both accidents and suicides (Table 3), the origins of the fire are different. In accidents, cigarette-lighter-related and electric problems predominate, whereas in suicidal deaths the use of flammable liquids occurs most frequently (Table 4). This latter point should be kept in mind by forensic investigators and law enforecement personnel who are confronted by a fire death and who must search for clues to establish either an accidental or suicidal manner of death for the fatality.

As compared to other forms of suicide in an older population [7] in the same geographic area, one notes a difference in that the usual non-fire-related suicide victim is a white male, and the self-immolation victim (Table 1) is a white female. Other differences include a higher percentage of suicide notes and a more frequent reason for the suicide being a "concern over health" among the non-fire-related group [7] (Table 5). However, both groups frequently have their terminal scenario at home. Truly, the self-immolation suicide fatality is an interesting and unique population requiring further study.

Such future studies can involve several areas. One study that should be performed is a comparison with homicidal fire deaths that occur within the same

geographic area. Also noteworthy would be a study by clinicians of those individuals who survice a suicidal attempt by fire. A discussion of the salvage, both physically and psychologically, would be most relevant. Finally, studies from other countries would be very interesting and stimulating.

In summary, this study on self-immolation has characterized the population group involved by several parameters and compared such a group with previous studies on the phenomenon, with accidental fire deaths, and with other types of suicide. It is suggested that future studies be made both by clinicians and by forensic scientists in other countries for comparison with this article.

References

1. Davis JH (1962) Suicide by fire. J Forensic Sci 7:393–397
2. Scully J, Hutcherson R (1983) Suicide by burning. Am J Psychiatry 140:905–906
3. Persley F, Pegg S (1981) Burn injuries related to suicide. Med J Aust 1:134
4. Ashton J, Donnan S (1979) Suicide by burning – A current epidemic. Br Med J 2:769–770
5. Modan B, Nissenkorn I, Lewkowski S (1970) Comparative epidemiologic aspects of suicide and attempted suicide in Israel. Am J Epidemiol 91:393–399
6. Copeland AR (1985) Accidental fire deaths – The 5-year Metro Dade Country experience from 1979 until 1983. Z Rechtsmed 94:71–79
7. Copeland AR (1985) Suicide among the elderly – The Metro Dade County experience during the years 1981, 1982, and 1983. Med Sci Law (in press)

Received February 26, 1985