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Application of Forensic Toxicology to the Problem of Domestic Violence

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ABSTRACT: The role of the forensic toxicologist in helping to determine causes of death or in aiding in the resolution of "driving under the influence" or similar cases is well known and clearly understood. Less clearly defined is the position of the forensic toxicologist vis-à-vis other socially significant problems. However, as the 21st century approaches, it is worth considering how forensic toxicology can help in unraveling some of these problems.

The problem of violence between intimates—that is, domestic violence—is a social problem in which it has been long felt that alcohol has played a part. Until now, though, no carefully controlled toxicological studies have been conducted to substantiate this or to determine whether other drug use is associated with domestic violence.

At the San Francisco Medical Examiner's Office, toxicological data from both the victim and the suspect in 20 cases of domestic violence that ended in homicide have been gathered. It was found that alcohol or other drugs or a combination of these factors was invariably present in the suspect, the victim, or both.

The implications of these results and how they can be used to develop a toxicological strategy to help reduce the most serious consequences of domestic violence are presented.

KEYWORDS: toxicology, violence, domestic violence, alcohol, abuse drugs

Domestic violence has been defined in various ways [1-4]. But essentially it can be regarded as violence between intimates which would evoke legal action if directed towards a stranger. It is a major problem—for instance, 16 000 000 Americans are assaulted each year by members of their own families [5]—and it is a complex problem. This was recognized in the 1985 Surgeon General's Workshop on Violence, which said that domestic violence must be recognized as a public health menace with which police alone cannot cope [6].

Domestic violence affects all segments of society. Historically, though, women have been its major victims. If all the forms of violence are considered, it has been estimated that up to 6 000 000 women are abused each year by their husbands, ex-husbands, boy-friends, or lovers [7,8]. And wife abuse is a major cause of injury to women, accounting for nearly three times as many medical visits as motor vehicle crashes [5].

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Domestic violence recurs and escalates in frequency and severity over time. Often a history of assaults is the preface to spousal murder. For example, it was found that in 85% of the domestic violence homicides in a two-year period in Kansas City, police had been called to the residence at least once on a domestic violence incident prior to the death. In 50% of the cases, police had responded at least five times [9-11]. Nationally, 20 to 24% of all homicides involve family relations, and at least 30% of women who are killed are murdered by husbands or lovers [2,12].

It has long been felt that alcohol plays a significant role in domestic violence. The view that the archetypal wife-beater is a "drunken bum" and that alcohol and other drugs "take the place of love and reasonableness and responsibility and healthy fear of unknown consequences" has often been accepted without question [13,14]. However, when this view has been investigated more closely, it has been concluded that alcohol use is far from being a necessary cause of or sufficient justification for wife abuse [15].

Given these contradictory claims, it is difficult for the criminal justice system to weigh correctly the significance of alcohol or other drug use when evaluating domestic violence problems and to develop a strategy to combat these problems. The task is compounded by the fact that most reports of alcohol and other drug use in connection with domestic violence are based on anecdotal accounts. Thus, a clear need exists to define more precisely the relationship between an abuser's intake of alcohol and other drugs and the frequency, severity, and lethality of domestic abuse. This is the purpose of this study.

For many years, it has been the practice in the Toxicology Department of the San Francisco Medical Examiner's Office to conduct as full a toxicological examination as possible on physiological specimens obtained from suspects in homicide cases, as well as to perform a complete toxicological evaluation on all homicide victims. During the period May 1985 through June 1988, the San Francisco Medical Examiner's Office Toxicology Department received specimens from both the victim and the suspect in 20 homicides that had been identified as domestic violence cases by members of the Family Violence Project of the San Francisco District Attorney's Office, the advocacy unit which assists victims of domestic violence. While the largest category of cases involved partners (spouses and intimate cohabitants), one involved a child killed by its parent. In many of the cases there was a history of domestic violence which was reflected in various police and other agency reports. The results from the analyses of those specimens are presented and their value in developing a sound response by the criminal justice system is discussed.

Methods and Materials

Samples from the victims of domestic homicide were collected at autopsy. Blood, liver, kidney, gastric contents, and vitreous humor were obtained in all cases. Urine, bile, and cerebrospinal fluid were collected when these samples were available. Blood and urine samples were collected from the live suspects in the domestic violence cases when they were apprehended. In all cases, apprehension occurred at or close to the crime scene and all arrests were made very soon after the homicide was committed. As far as possible, both blood and urine were collected from the suspect so that the drug status of the individual at the time of the crime could be more precisely determined. Two of the cases studied were homicides/suicides, so the suspects' samples were also collected at autopsy in these cases.

Analyses for alcohol, cocaine, amphetamines and other stimulants, phencyclidine, and benzodiazapines were conducted on samples from the victim and suspect in all the cases studied. Analyses for barbiturates, morphine-type alkaloids, and tricyclic antidepressants and analytically related compounds were conducted on all the victims. Depending on the sample type and availability, some of these tests were also performed on the suspects.

The alcohol concentrations were determined using a Bendix 2600 gas chromatograph

with a flame-ionization detector (FID) attached. A 40% castorwax 100/120 chromosorb WAW DMCS column was used. For other drugs, an initial examination procedure using the enzyme multiplied immunoassay technique (EMIT) system (Syva, Palo Alto, California) was conducted in cases where urine samples were available. The ETS System of Syva (an essentially fully automated EMIT System) later superceded the EMIT system in such cases. Any urine specimen that gave a positive result on this initial analysis and all blood samples were extracted via standard procedures for the drugs under investigation [16], and the extracts were introduced into a Hewlett-Packard 5710A gas chromatograph fitted with either a FID or a nitrogen-phosphorus detector (NPD), using a 3% OV-17 80/100 chromosorb W HP column. Gas chromatography/mass spectrometry (GC-MS) was then used to confirm and quantitate any drugs that appeared to be present in this system, using a Hewlett-Packard 5890 gas chromatograph with a 5970 series mass selective detector (MSD) and an Ultra-1 column.

Results

The results of the toxicological analyses of the samples from the 20 cases of domestic violence which ended in homicide in San Francisco between May 1985 and June 1988 are summarized in Tables 1 through 3. All drugs that were detected were recorded.

The data in Table 1 refer to the percentage of cases in which a specific drug was found. Since one drug could have occurred in either the suspect, the victim, or both, or more than one drug could have been found in either the suspect or the victim (as shown by the frequency and type of drug use data in Table 2), the numbers in Table 1 do not add up to 100%. However, the data in Table 1 and Table 2 do show that alcohol was by far the most widely detected drug, being found in 85% of the cases studied. In particular, 70% of the suspects and 45% of the victims had alcohol present. (Interestingly, the lowest concentration of alcohol detected in both the suspects and the victims was 0.06%, with the range of alcohol concentrations found in the suspects being 0.06 to 0.26% and that in the victims being 0.06 to 0.40%; the average alcohol concentration was 0.13% in the suspects and 0.21% in the victims.) The second-most used drug was cocaine, which was

TABLE 1—Incidence of drugs in suspect and victim in 20 lethal domestic violence cases.

Drug	Percentage of Cases (No.)		Percentage of Total Cases (No.)
	Suspect	Victim	
Ethyl alcohol	70 (14)	45 (9)	85 (17)
Cocaine	30 (6)	15 (3)	35 (7)
Benzoyllecgonine	30 (6)	15 (3)	35 (7)
Methamphetamine	0 (0)	5 (1)	5 (1)
Δ -9-Tetrahydrocannabinol	5 (1)	0 (0)	5 (1)

TABLE 2—Frequency and type of drug use in 20 lethal domestic violence cases.

Drug	Percentage of Cases			
	Suspect	Victim	Suspect and Victim	Total
Ethyl alcohol	25	10	20	55
Cocaine and benzoyllecgonine	5	5	0	10
Ethyl alcohol and cocaine	10	0	10	20
Ethyl alcohol and methamphetamine	0	5	0	5
Ethyl alcohol, cocaine, and Δ -9-tetrahydrocannabinol	5	0	0	5
None	0	0	5	5

TABLE 3—*Drug status of suspect and victim in 20 lethal domestic violence cases.*

Drug Status ^a		Percentage of Cases
Suspect	Victim	
+	+	35
+	-	40
-	+	20
-	-	5

^aPresent (+) or absent (-).

found (always along with its metabolite, benzoylecgonine) in a little more than a third of the cases. As with alcohol, considerably more suspects (30%) than victims (15%) had cocaine and benzoylecgonine present. The combination of alcohol and cocaine (and benzoylecgonine) was found in 20% of the cases. Tetrahydrocannabinol was found in one suspect and methamphetamine was found in one victim, each in combination with other drugs. No other drug was detected in any of the cases.

In Table 3, the drug status of the suspect or victim refers to whether alcohol or any other drug was present (either singly or in combination) or absent in any of the samples that were analyzed. These data clearly show that in 95% of the cases, a drug or drugs was found in either the suspect or the victim or both.

Discussion

The role of alcohol in violent interpersonal crimes has been studied extensively, and a number of reviews on the relationship between alcohol use and domestic violence have been presented [8,13,17-19]. A variety of conclusions has been drawn. Some studies have indicated that there is little association between alcohol use and domestic violence, whereas others have suggested either a strong connection or at least some involvement [15,20]. The question of whether a relationship between other drug use and domestic violence exists has not been clearly addressed.

The data in the current study clearly show that, in the case of lethal domestic violence, it is highly probable that alcohol or other drugs or both will be present and that alcohol or other drug use will not be confined exclusively to either the suspect or the victim. Also, since the range of cases investigated included male-female, male-male, and adult-child relationships, the presence of alcohol and other drugs in domestic violence is not dependent on the nature of the interpersonal association of the suspect and the victim.

Clearly, there are many questions raised by these facts; for example, does alcohol and other drug use produce domestic violence, or does domestic violence create a reliance upon alcohol and other drugs? However, the present investigation was not designed to address these questions specifically, nor does it attempt to define precisely any exact relationship between specific drug use (alcohol or cocaine, for instance) and violent behavior. It does show, though, that there is an overwhelming likelihood that alcohol and other drugs will be present in domestic violence situations, especially in lethal domestic violence cases. This means that clear strategies based upon toxicological, rather than anecdotal, considerations can be used by the criminal justice system to combat the domestic violence problem.

Thus, police department handling of domestic violence cases will be improved through training to note whether alcohol or other drugs are present and to ensure that blood and urine samples are always collected for toxicological analysis from the suspect at the time an arrest is made. The results of these analyses can then be used in various ways. For instance, they can assist prosecutors when agreeing on a case settlement, as well as help

in determining whether the court should impose drug-related treatment on the defendant as part of the sentence, whether a drug treatment program should be a mandatory part of any probation, or whether state correctional facilities should provide alcohol and other drug counseling to committed offenders [21,22].

Conclusions

In the past, only anecdotal information from the victim or the suspect or both has provided the basis for how the criminal justice system reacted to the problem of alcohol and domestic violence [3,13,23]. The reaction generally has been wide-ranging, ill-defined, and inconsistent [13,24]. Since precise toxicological data have now established that alcohol or other drugs almost certainly will be present in lethal domestic violence, it is imperative that the criminal justice system respond promptly and aggressively and that it conduct a complete toxicological investigation when confronted with a domestic violence problem. In such situations, police must pursue mandatory arrest [25] and drug analysis rather than mediation and counseling, otherwise there will be a recurrence and escalation of the violence which, in all likelihood, may well end in a homicide, where it is highly probable that alcohol or other drugs will have played a part.

For a long time, police, the courts, and forensic toxicologists have been intimately involved with the consequences of the illegal use of drugs. "Driving under the influence" is a good example of this. The increase in the participation of all parts of the criminal justice system in the problem of domestic violence, as now suggested, is an extension of that involvement. It is an important extension, since there very likely will be larger numbers of lethal domestic violence cases as a result of the universal increase in drug use. And, as in many areas of drug taking that have social and legal consequences and in which toxicology assists in alleviating the problem, the forensic toxicologist has an important role to play in helping to reduce the level of domestic violence.

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