

## Firearm-Related Mortality: A Review of Four Hundred-Forty Four Deaths in Diyarbakir, Turkey between 1996 and 2001

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GOREN, S., SUBASI, M., TIRASCI, Y. and KEMALOGLU, S. *Firearm-Related Mortality: A Review of Four Hundred-Forty Four Deaths in Diyarbakir, Turkey between 1996 and 2001*. Tohoku J. Exp. Med., 2003, **201** (3), 139-145 — The current study is based on a retrospective investigation of firearm deaths in Diyarbakir, which were autopsied by the Diyarbakir Branch of the Council of Forensic Medicine during the 6- year period. Four hundred-forty four deaths were investigated from January 1996 through December 2001, including homicide (296 cases, 66.7%), suicide (120 cases, 27%) and accidental shootings (28 cases, 6.3%). The age range of all firearm deaths in the study period was 5 to 75 years with a median age of 29.8 years. The majority were in the groups aged 16-25 years (38.7%). In the homicide group, 248 subjects (83.8%) were male, and 48 (16.2%) were female. The 31.1% of the homicide victims were in the group aged at 20-30 years. Of the 120 suicide victims, 56 (46.7%) were in the group aged 16-20 years. The head was by far the favoured site, accounting for 82 (68.3%) deaths: entry wounds in the right temple accounted for 72 of these. Twenty-eight cases were accidental shootings and 18 of them were male (64.3%). Twelve of the 28 accidental victims (42.9%) were in the group aged 0-10 years. The eight cases were due to their own accidental shootings, and the remaining 20 cases were shot by others. Our findings show that the contributing factors for increasing death by firearm are terrorists' activities, traditional habits of obtaining and using guns and blood feuds. ——— gunshot; handgun; firearm fatalities; Turkey; Diyarbakir  
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Easy access to potentially lethal weapons, especially a firearm, increases the risk of fatality from any violent altercation. Assaults in which a gun is used are alleged to be five times more likely to result in death than are assaults involving a knife, the next most lethal weapon (Rushforth et al. 1977; Kellerman et al. 1996; Elfawal and Awad 1997; Azmak et al. 1998).

The law in Turkey strictly limits the availability of private gun ownership, despite deaths due to gunshot still occur. However, unfortunately, the illegal availability of firearms, especially handguns, to the civilian population is very common in Diyarbakir. In the current study, we investigated the criteria of firearm fatalities in Diyarbakir and compared it with results of others studies elsewhere for assessing the contributing factors to the increasing firearm fatalities.

## MATERIALS AND METHODS

The current study is based on a retrospective investigation of firearm deaths in Diyarbakir which were autopsied by the Diyarbakir Branch of the Council of Forensic Medicine during the 6-year period from January 1996 through December 2001. During this period total number of criminal deaths were found to be 3000, and the three most frequent

reasons were traffic accidents with 997 (33.2%) deaths, falls from height with 484 (16.1%), and firearms with 444 (14.8%) deaths. According to The Turkish State Institute Statistics (SIS), the population of Diyarbakir is 1 362 708, with age distributions of; 406 073 (29.8%) persons in 0–10 years group, 185 473 (13.6%) in 11–15 years, 163 122 (11.9%) in 16–20 years, 140 386 (10.3%) in 21–25 years, 109 377 (8%) in 26–30 years, 151 045 (11.1%) in 31–40 years, 87 643 (6.4%) in 41–50 years, 56 812 (4.2%) in 51–60 years, 40 521 (1.3%) in 61–70 years, and 16 886 (1.2%) in 71–80 years group (SIS 2000).

All firearm fatalities occurring during that period, whether suicidal, homicidal or accidental were included in the study. Autopsy records were analysed to evaluate the cases in terms of age, sex, manner of death, site of entrance, type of firearm, circumstances surrounding the death, marital status of the victim for detecting family conflicts, relationship between the injury and season and the hospitalisation before death. Deaths caused by other explosives were excluded.

## RESULTS

### *Demographic data*

Four hundred-forty four deaths were investigated from 1996 to 2001. The age range of all

TABLE 1. *Age distribution of firearm*

Age group	Homicide		Suicide		Accident		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
0–10	2	0.7	—	—	12	42.9	14	3.2
11–15	20	6.7	6	5	6	21.4	32	7.2
16–20	46	15.5	56	46.7	6	21.4	108	24.3
21–25	44	14.9	20	16.7	—	—	64	14.4
26–30	48	16.2	12	10	—	—	60	13.5
31–40	52	17.6	12	10	—	—	64	14.4
41–50	52	17.6	8	6.7	2	7.1	62	14
51–60	16	5.4	4	3.2	—	—	20	4.5
61–70	14	4.7	—	—	2	7.1	16	3.6
71–80	2	0.7	2	1.7	—	—	4	0.9
Total	296	100	120	100	28	100	444	100

TABLE 2. *Sub-classification of gunshot deaths*

	Homicide		Suicide		Accident		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Male	248	83.8	70	58.3	18	64.3	336	75.7
Female	48	16.2	50	41.7	10	35.7	108	24.3
Married	198	66.9	40	33.3	6	21.4	244	55
Single	98	33.1	80	66.7	22	78.6	200	45

TABLE 3. *Death places of victims*

	Homicide		Suicide		Accident		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
House	58	19.6	96	80	10	35.7	164	36.9
Street	160	54	4	3.4	2	7.2	166	37.4
Farmland	58	19.6	10	8.3	16	57.1	84	18.9
At work	6	2	10	8.3	—	—	16	3.6
In car	12	4.1	—	—	—	—	12	2.7
Cafe	2	0.7	—	—	—	—	2	0.5
Total	296	100	120	100	28	100	444	100

TABLE 4. *Seasonal distribution of firearm fatalities*

Season	Homicide		Suicide		Accident		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Winter	60	20.3	24	20	4	14.3	88	19.8
Spring	86	29	38	31.7	10	35.7	134	30.2
Summer	90	30.4	26	21.7	8	28.6	124	27.9
Autumn	60	20.3	32	26.6	6	21.4	98	22.1
Total	296	100	120	100	28	100	444	100

firearm deaths in the study period was 5 to 75 years with a median age of 29.8 years (Table 1). Most of the victims (75.7%) were male and the male/female ratio was 3.1. The majority were in the groups aged 16–25 years (38.7%). Marital status was recorded in all deaths, 244 of whom were married (55%) and 200 were single (45%).

#### *Manners of deaths*

All cases retrieved were classified as suicide, homicide or accident on the basis of the

information surrounding the circumstances of the death and the information supplied from autopsy files of branch of the council of forensic medicine by the authors.

#### *Homicide deaths*

In the homicide group, 248 subjects (83.8%) were male, and 48 (16.2%) were female (Table 2). The 198 homicide victims (66.9%) were married. The 31.1% of the homicide victims were in the group aged at 20–30 years. In the 0–10 and 70+ aged groups homicides were 0.7%

TABLE 5. Entrance wound location according to the manner of death

Entrance site	Homicide		Suicide		Accident		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Head/neck	86	29	82	68.3	12	42.9	180	40.5
Chest	44	14.9	6	5	6	21.4	56	12.6
Abdomen	26	8.8	32	26.7	8	28.6	66	14.9
Extremities	8	2.7	—	—	2	7.1	10	2.3
Head/chest/abdomen/ext	10	3.4	—	—	—	—	10	2.3
Chest/abdomen	10	3.4	—	—	—	—	10	2.3
Head/chest	26	8.8	—	—	—	—	26	5.8
Head/chest/ext	14	4.7	—	—	—	—	14	3.1
Head/abdomen	—	—	—	—	—	—	—	—
Head/chest/abdomen	6	2	—	—	—	—	6	1.4
Head/ext.	10	3.4	—	—	—	—	10	2.3
Chest/ext.	16	5.4	—	—	—	—	16	3.6
Abdomen/ext.	18	6	—	—	—	—	18	4.0
Chest-Abd.-ext	22	7.4	—	—	—	—	22	4.9
Total	296	100	120	100	28	100	444	100

(Table 1). In 160 (54%) of homicide cases, death had occurred in street (Table 3). Handgun was used in 238 cases (80.4%), a shotgun in 28 cases (9.5%), and a rifle in 30 cases (10.1%). Of the homicide victims, 220 (74.4%) were exitus - entrance in emergency service. There was an increase in firearm fatalities in the summer season (30.4%) (Table 4). The sites of injuries illustrated that 29% of the homicidal shots were directed towards the head and neck (Table 5).

### *Suicide deaths*

There were 120 (27%) suicide victims in this series, in which 50 cases were female (41.7%). Forty (33.3%) of the 120 suicide victims were married. Fifty-six (46.7%) were in the group aged 16–20 years, 20 (16.7%) were in the group aged 21–25 years. There were only two suicide victims (1.7%) in the group aged 71 and over. In 92 of the suicide cases the weapon used was a handgun (76.7%), and in the remaining 28 cases a shotgun (23.3%). Ninety-six suicide cases occurred at home (80%). The head was by far the favoured site, accounting for 82 (68.3%)

deaths : entry wounds in the right temple accounted for 72 of these (Table 5). The 82 (68.3%) of the suicide victims were exitus - entrance in emergency service.

### *Accidental deaths*

Twenty-eight (6.3%) cases were accidental shootings, and eighteen of them were male (64.3%)(Table 2). Fourteen victims of accidental death were shot with shotgun, ten were shot with handguns. Twelve of the 28 accidental victims (42.9%) were in the group aged 0–10 years and 6 (21.4%) were in the group aged 11–15 years and 6 (21.4%) in the group aged 16–20 years (Table 1). The eight cases were due to their own accidents, and the remaining 20 cases were shot by others.

Sixteen (57.1%) accidental cases occurred in farmland, 10 (35.7%) at home, 2 (7.1%) in street (Table 3). In the accidental cases, 42.9% of victims were shot in the head, 28.6% in the abdomen, 21.4% in the chest and 7.1% in the extremity (Table 5). The 12 cases (42.9%) of the accidental victims were exitus - entrance in emergency service.

## DISCUSSION

Although, the law in Turkey strictly limits the availability of private gun ownership, the illegal availability of firearms, especially handguns, to the civilian population is very common in our region. This is mostly due to blood feuds, terrorist activities and traditional habits of owning and using weapons.

Firearm fatalities constituted 14.23% of all medicolegal autopsies in Diyarbakir. Among the 1.362 million population of Diyarbakir, 74 gunshot fatalities occurred annually during the 1996–2001 (5.69/100 000 living persons). Our results were different from other studies as reported by Elfawal (0.35/100 000 living persons), Azmak (1.58/100 000 living persons), Al Ragheb (1.4/100 000 living persons) and Riddick (53/100 000 living persons) (Abualragheb 1984; Riddick et al. 1993; Elfawal and Awad 1997; Azmak et al. 1998). There is no definite explanation for the above differences among the countries, since there are also differing results in local areas within the countries.

Among the total of 444 cases of homicides, suicides and accidental shootings, homicide accounted for 66.7% of the victims. This is similar to the previous results in the literature (Abualragheb 1984; Rouse and Dunn 1992; Riddick et al. 1993; Guileyardo et al. 1994; Kellerman et al. 1996; Elfawal and Awad 1997; Azmak et al. 1998; Moug et al. 2001).

Most fatalities in this study occurred in young males. Mean age of all fatalities was 29.8 years of whom 62.6% were lower than 30. These findings are similar to those Elfawal, Abu Al Ragheb and Al-Kolaly have reported (Abualragheb 1984; Al-Kolaly et al. 1992; Elfawal and Awad 1997), but different from those from Thomsen and Hardt-Matsen have reported (Hardt-Madsen and Simonsen 1983; Thomsen and Albrektsen 1991), where more fatalities occurred in older individuals. In our study, homicide was most frequent in 20–30 (31.1%) years, suicide in 15–25 (63.4%) years and

accident in 0–10 (42.9) years age groups. Riddick and Moug (Riddick et al. 1993; Moug et al. 2001) reports have shown that homicide victims are predominantly young males, whereas suicide victims are predominantly middle-age elderly men. In our study, rates of females were 16.2% in homicide and 41.7% in suicide groups. In the literature, females were reported to have used weapons for suicide less frequently (Knight 1977; Selway 1991; Elfawal and Awad 1997; Mitchell and Milvenan 1997). However, in our study, population rate of females who used weapons for suicide was found to be 28.7%.

The homicides tended to occur in street (54%), the suicides tended to occur at home (80%), the accidental tended to occur in farmland (57.1%). The eight cases of the accidental shootings were shot by themselves, and the remaining 20 cases were shot by others. Since our region is an agricultural area, shotgun is frequently used. Accidental deaths are occasionally caused by shotgun. Most of those (64.3%) are younger than 15 years of age. Accidental firearm fatalities and scene investigation are studied in detail by Copeland, Ornehult and Azmak (Copeland 1984; Ornehult and Ericksson 1987; Azmak et al. 1998). According to these papers most firearm accidents were caused by playing with a weapon, showing a firearm to another. Our findings of accidental fatalities are similar features. Our two fatalities had occurred at the balcony due to a gunshot during a show after a soccer match win.

The type of weapon used in firearms deaths differed depending upon the circumstances surrounding death. Hand guns were used in the majority of cases in this series (76.6%). The similar results were reported by Elfawal and Awad (1997), Azmak et al. (1998), Abualragheb (1984), Riddick et al. (1993), Muscat and Huncharek (1991). In our study, 92 of the suicide cases the weapon used was a handgun (76.7%), the remaining 28 cases using a shotgun



(23.3%) Fourteen victims of accidental death were shot with shotgun, ten were shot with handguns. Handgun was used in 238 (80.4%) of the homicide, a shotgun was used in 28 (9.5%), a rifle was used in 30 (10.1%). In the present study, similar to other reported studies (Eisele et al. 1981; Boyd 1983; Abualragheb 1984; Elfawal and Awad 1997; Azmak et al. 1998) but different from some studies (Hardt-Madsen and Simonsen 1983; Thomsen and Albrektsen 1991; Rouse and Dunn 1992; Avis 1994).

In presented series, the head (68.3%), chest (5%) and abdomen (26.7%) were the commonest sites of entrance wound in suicide by handguns (76.7%), and the entrance wound was located in the right temple in 60%. Selway (Selway 1991) has reported that suicides are, to a significant degree, committed by shooting at the head, in particular the right temple. All of the cases had single shot in suicides. Oral cavity is the most common site of entrance is stated In some reports in literature (Thomsen and Albrektsen 1991; Karlsson et al. 1993; Avis 1994). Homicides were mostly commitment by handgun (80.4%). The entrance sites are also similar for homicide and suicide and the most encountered entrance site is head (29%) (Eisele et al. 1981; Muscat and Huncharek 1991; Selway 1991; Chapman and Milroy 1992; Avis 1994; Azmak et al. 1998).

Although legislative restrictions on firearms were present on the illegal access to firearms, easy access to firearm is the most important factor for increasing death by firearm. In our region, the contributing factors for this phenomenon are terrorists' activities, blood feuds, traditional habits of obtaining and using guns.

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