

EPIDEMIOLOGY OF TRAFFIC ACCIDENTS IN TEHERAN*

III. HOST: THE INJURED AND DEAD

Kiumarss Nasserì

Abbas Sing

Firouz Azordegan

Aboul Hassan Nadim**

SUMMARY

In this study, the total of 6,700 casualties by car accidents in the city of Teheran, during one year period (1973) was examined. Amongst these casualties 4,159 persons were referred to the Sina Hospital, of whom 3,276 were males, 852 were females and the remaining persons were unknown.

In terms of seriousness of the accident of these individuals involved, 24.0 per cent were treated at the out-patient department, and the remaining 76.0 per cent have been hospitalized.

The study shows no significant variation for the daily referral of accident cases to the hospital.

The data also reveals that during the year under study, the total of 560 persons were killed due to the accidents, of which 123 were females and the remaining 437 were males.

According to the existing death registration the most important causes of death are: brain haemorrhage and skull fracture.

INTRODUCTION

A great number of individuals suffer injuries or die in road accidents around the world and the total number is increasing every year.

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** Department of Epidemiology and Biostatistics, School of Public Health, University of Teheran, P.O. Box 1310, Teheran, Iran.

A conservative global estimate by the World Health Organization gives the figure of 250,000 deaths per year⁽¹⁾. Road accident mortality has exceeded the mortality from infectious diseases in developed countries and is among the first five killers in the developing countries. Death is only one aspect of the problem and it is estimated that for each person killed on the road, about 40–50 persons receive serious and minor injuries⁽²⁾. The unproportional wastage of active human life is another important aspect of the problem and up to 50% of the deaths in the age group of 15–24 has been due to road accidents in some European countries⁽³⁾.

The present paper attempts to describe the various important characteristics of the injured and the killed individuals in traffic accidents in Teheran.

MATERIALS AND METHODS

All the available information on the records of the victims of traffic accidents which were referred to Sina Hospital, a teaching hospital affiliated with the University of Teheran, and the Bureau of Forensic Medicine, Ministry of Justice, in 1973 (actually from 21 March 1973 to 21 March 1974 corresponding to the Iranian Imperial year of 2532) were collected and analyzed. "Teheran" refers to the city which is under the jurisdiction of the Municipality. Only the files of the victims who were classified as road casualties were used.

RESULTS

Of the total of 6,700 casualties reported in the files of the bureau of traffic for the period of this study, 79 persons have died at the scene of accident and 4,159 of 62.8% have been referred to Sina Hospital. Of these, 24% have been treated as out patients and the rest have been hospitalized for an average of 2.35 days. There is no significant daily variation in the referrals to hospital and the seasonal variation of both the injured and the killed is similar to that of the occurrence of the accidents previously reported⁽⁴⁾. The time curve for arrival at hospital versus the time curve for the occurrence of the accidents are shown in Figure 1. The age and sex distribution of the 4,159 injured (3,276 male, 852 female, 31 unknown) referred to Sina Hospital is shown in Figure 2. About 85% of the hospitalized victims have entered hospital in complete consciousness and 80% of them have had minor wounds. About 50% of the injured classified as "drivers" were

riding a motorcycle, whereas for "non-drivers" 67% were injured by private cars. Tables 1 and 2 show the location and the extent of the lesions.

The age and sex distribution of 560 persons (123 females, 437 males) killed in the traffic accidents is shown in Figure 3. Apart from the 79 individuals who have died at the scene of the accident, 93 people have died at Sina Hospital (of which 55% has been during the first 24 hours after arrival (Table 3)). This gives a case fatality rate of 3% at the hospital. However, the estimate of general case fatality rate is 8.4%.

Among the immediate causes of death, the most important one is the fracture of skull and brain haemorrhage which accounts for more than 50% of all deaths (Table 4). An estimate of the risk of dying for those injured in the traffic accidents by age and sex is shown in Figure 4.

DISCUSSION

Apart from the incompleteness of the recorded data used for this study, certain interesting points are observed. As we have reported previously⁽⁴⁾ the crowdedness plays an important role in the occurrence and outcome of the accident. Moreover, it influences the transfer of victims to hospital and during the peak accident hours the lapse of time between the occurrence of the accident and referral to hospital reaches two hours (Fig. 1).

In referring to hospital, the general assumption that the victim is referred to the nearest hospital does not hold true and, in fact, two thirds of our victims have been referred to Sina Hospital which is well known for its emergency clinic. Similar findings have been reported by others too⁽⁵⁾. The discrepancy observed in the general case fatality rate of 8.4% and the low case fatality rate of 3% at Sina Hospital and also the rather mild nature of the collision impact on the victims at Sina Hospital (Tables 1 and 2) may reflect the fact that seriously injured are referred to the nearest hospitals which are not well equipped to handle such cases or simply die during transportation. However, such assumption needs verification. The age and sex distribution of the killed and injured follows a universal pattern of young male dominance based on the exposure. The male-female ratio for the injured and the killed are 3.8:1 and 3.6:1 respectively. However, the age distribution for the injured and killed females, Figures 2 and 3, respectively, points to a higher involvement and death in 0-4 and 5-9 years age groups. Even though the exposure theory and lack of quick response to the dangerous situation could partially explain the female injury pattern, the mortality pattern needs more

explanation. Figure 4 represents the estimated pattern of dying of the victims of traffic accidents by age and sex. As is shown, the risk of dying in the male, behaves like a chronic disease and increases with age, whereas the risk of dying in the female assumes a 'J' shape indicative of infectious diseases. The reason for such discrepancy is not known and should be looked into in the future.

FIG.1
COMPARISON OF THE COLLISION TIME AND ARRIVAL OF THE INJURED
AT SINA HOSPITAL, TEHRAN-1973

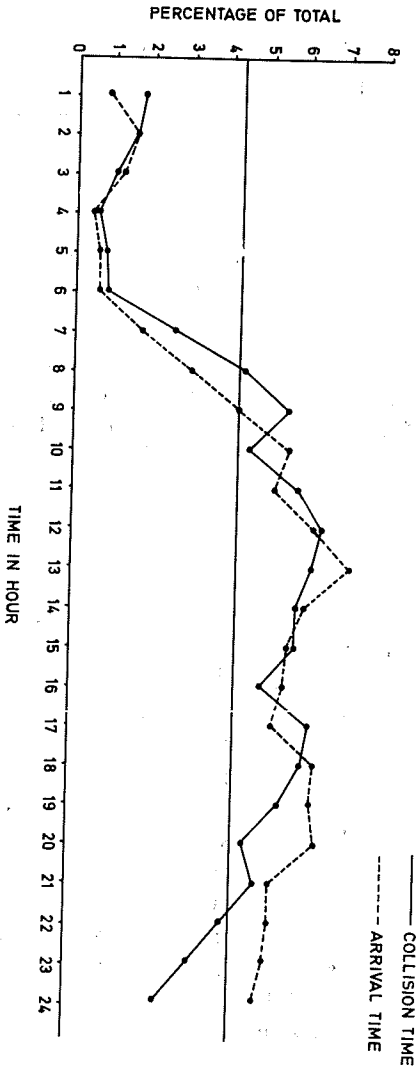


FIG.2
DISTRIBUTION OF THE INJURED IN THE TRAFFIC ACCIDENTS
BY AGE AND SEX - TEHRAN 1973

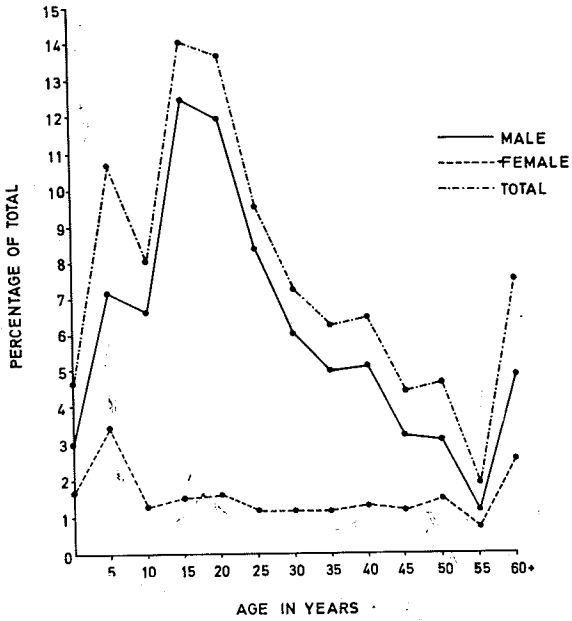


FIG.3
TRAFFIC ACCIDENT FATALITY BY AGE AND SEX
TEHRAN-1973

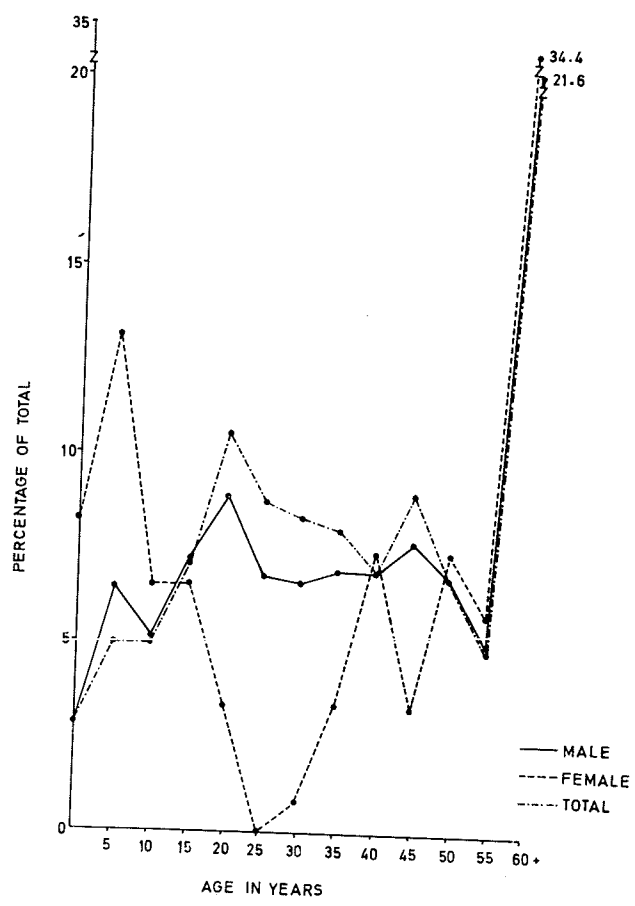
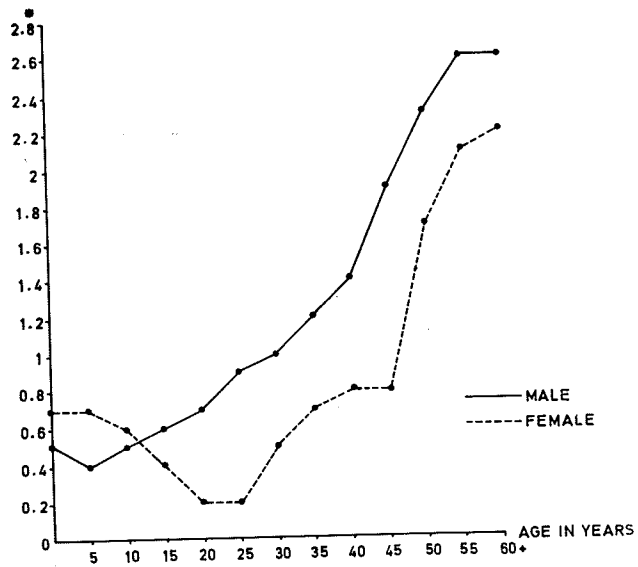


FIG. 4
RISK OF DYING IN TRAFFIC ACCIDENT CASUALTIES
TEHRAN 1973



● PROPORTION OF THE 15 YEARS MOVING AVERAGE PERCENTAGE OF THE KILLED OVER THE PERCENTAGE OF THE INJURED IN EACH AGE GROUP.

Table 1
Bodily distribution of trauma site on traffic accident victims
hospitalized at Sina Hospital
Teheran, 1973

Location	Number	Per cent
Extremities	1,407	44.57
Head and neck	1,064	33.70
Chest and abdomen	376	11.91
Mixture of various sites	218	6.91
Unidentified	92	2.91
Total	3,157	100.00

Table 2
Prevalence of various lesions of the traffic accident victims
in Sina Hospital
Teheran, 1973

Type of Lesion	Number	Per cent
Contusion	1,587	50.27
Laceration	1,400	44.35
Bone Fracture	1,027	32.53
Open Wounds*	276	8.74
Cranial Haemorrhage	109	3.45
Loxation	40	1.27
Internal Haemorrhage	25	0.79
Others	15	0.48

* Wounds requiring suture

Table 3
Time lapse between the arrival and death of the traffic accident victim
at Sina Hospital
Teheran, 1973

Time Lapse	Number	Per Cent
One day and less	52	55.91
2 days	5	5.38
3 days	4	4.30
4 days	1	1.08
5 days	2	2.15
6 days	1	1.08
7 days	2	2.15
7 days and more	6	6.46
Unrecorded	20	21.51
Total	93	100.00

Table 4
Causes of deaths in the victims of traffic accidents
Teheran, 1973

Cause of Deaths	Number	Per Cent
Skull fracture and cranial haemorrhage	326	58.32
Internal damage and bleeding	210	37.57
Others*	12	2.15
Unrecorded	12	2.15
Total	560	100.00

* Such as burning, external bleeding

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