EMERGENCY TREATMENT OF TRAUMA VICTIMS
A study of 1000 Patients at Emergency Department of Jinnah Hospital, Lahore

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ABSTRACT

The first death due to traffic accident reported in the literature took place in New York on 13th September 1899. As number of vehicles on the roads increased the death due to accidents also increased. In order to control accidental injuries "National Safety Council" was established in USA in 1914. The World Health Organization Statistics (1984) have shown that 74% of 2.67 million deaths due to injuries and poisoning took place in the developing countries. Much has been done to prevent occurrence of accidental injuries and treatment of the injured all over the world. A lot is to be done in Pakistan. The present study was carried out at Jinnah Hospital, Lahore to find out the: (1) personality of the trauma victims (2) the location and nature of the accidents; (3) the types of the fractures and the soft tissue injuries; (4) the type, cost and outcome of acute care provided during the first 24 hours. Present study has shown that male to female ratio of patients was 3.3:1, 32% were less than 45 years of age, 73% were laborers, house wives and students, 88% had education less than Metric, 48% injuries were due to RTA, 83% of the RTA took place on city roads, 52% accidents took place within 10 km. from the hospital, 21% patients were multiply injured, 10% of all soft tissue injuries were amputations and arterial injuries, 17% patients arrived in distress or shock, 43% patients required procedures and mean cost of emergency treatment (excluding service and hospital charges) of these patients was Rs. 2722.50. It is recommended that government of Pakistan must take serious measures to prevent the occurrence of injuries and develop facilities for on time effective treatment of injured.

INTRODUCTION

It has been estimated that during the third millenium, approximately one million people will die and another fifteen million will be injured because of road traffic accidents every year. If average life expectancy is assumed to be 50 years, then in the world with population of five billion, it is estimated that two persons in every 200 will die because of the injuries sustained during a road traffic accident (Hutchinson, T. P., 1987).

Injury is the leading cause of death in the first 4 decades of life (Templeman D. C., 1999). The cost to society from hospitalization and lost productivity approaches $100 billion per year in United States of America (five times more than the annual GDP of Pakistan). The cost of treatment of per hospitalized patient due to accidental injuries range from $7,000 to 20,000 (Templeman, D.C. 1999).

During 1987 more than 500 million Cars and commercial vehicles and 150 million motorcycles were in use all over the world (MVMA, 1987). It was then established that in a country such as

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Sweden one motor vehicle in four hundred was involved in a fatal crash at some stage in the year; in Australia about one in three hundred; in Philippine one in forty; and in Ethiopia one in six. By the end of 20th century these figures must have increased.

It has been shown by the Hutchinson, T. P. (1987), UN Statistical year book, World Health statistics, and Accidents Facts of National Safety Council of USA (1986) that for every 10,000 vehicles there are 2.5 death in Sweden, 2.7 in USA, 3.2 in UK, 44 in Turkey and 98.2 deaths in Pakistan. This shows very unsatisfactory level of Traffic Safety in Pakistan.

During the 2nd World Conference on prevention of Accidents, it was recommended that 40% of road surface must be reserved for the non motorized vehicles and pedestrians in developing countries, not enough in this aspect has been done in Pakistan.

This has been shown that for every 100 deaths due to road traffic accidents 50 deaths occur during the first 20 minutes after the accident due to vital organ failure, 30 deaths occur during the next 3 hours due to the delayed or defective emergency care, and 20 deaths occur during the next three weeks due to different complications during the treatment. Improvements in critical care have reduced the mortality associated with multiple organ failure from 90% to 50% (Templeman, D. C., 1999).

Injuries from gunshots have increased at an alarming rate over the last decade. In 1994, there were an estimated 38,500 deaths and 90,000 nonfatal injuries in the USA due to gunshots.

The immediate care of multiply injured patients consists of determining what is injured and repairing those injuries in correct order of importance and in a timely fashion. The subsequent care involves monitoring the patient and preventing complications. The prophylactic therapies indicated include: (1) meet the nutritional needs; (2) Prevent stress bleeding, venous thrombosis, and pressure sores; and (3) antibiotic coverage.

Although much has been done in the world to: (1) prevent the accidental injuries; and (2) to treat the injured, not much has been done in Pakistan. This is made clear by the study conducted by the author during 1991 at Mayo Hospital Lahore. All 40,280 trauma victims who presented in the accident and emergency department of Mayo Hospital during 1991 were studied and analyzed. The study showed that 79% trauma victims were male, 72% were below 30 years of age, 77% were injured by RTA, fall or violence, 60% were illiterate, 60% were brought to the hospital on a Rickshaw (a three wheeler) or a motor cycle, 57% were either laborers or students, and 76% trauma victims reached hospital within 6 hours after the accident (Rizwan, N., and Awais, S. M., 1994).

The present study was carried out at the department of Orthopaedic Surgery, Allama Iqbal Medical College and Jinnah Hospital, Lahore during year 2000. Data regarding consecutive 1000 patients was analyzed. The aims were to find out the: (1) personality of the patients; (2) the location and nature of the accidents; (3) the types of the fractures and the soft tissue injuries; (4) the type of acute care provided during the first 24 hours at the accident and emergency department of Jinnah hospital; (5) the cost of the acute care: and (6) the outcome of the treatment.

MATERIAL AND METHODS

All patients (all ages and both sexes) presented to the accident and emergency department of Jinnah Hospital, Lahore (except every Tuesday) during year 2000 were included in the study.

RESULTS

Out of 1000 patients, 766 (76.6%) were male and 234 (23.4%) were female. Of the total patients 82% were less than 45 years old. Table 1 shows distribution of patients in different age groups.

Table 1: Distribution of patients according to age (N = 1000).

Age in Years	No. of Patients	Percentage
0-15	275	27.5%
15-25	252	25.2%
25-45	290	29%
45-65	128	12.8%
65 and above	55	5.5%
Total	1000	100%

Majority of the patients (73%) were laborers, house wives or students. Table 2 shows the distribution of patients according to the professions.

Table 2: Distribution of patients according to professions.

S. No.	Patients Occupation	No.	%
1.	Labourers	354	35.4
2.	Housewives	200	20.0
3.	Students	176	17.6
4.	Businessman	86	8.6
5.	Miscellaneous	184	18.4
	Total	1000	100%

Majority of the patients were illiterate (48%), had education less than 5 years of schooling (20%), more than 5 years and up to 10 years of education (22%), more than 10 years and up to 14 years of education (5.9%), and above 14 years of education were only 4.1%.

Most of the patients in this study did not have enough income to support their treatment if implant surgeries were indicated. Table 3. shows the distribution of patients in different income groups.

Table 3: Shows distribution of patients in different income groups.

S. No.	Group	No. of Patients	%
1.	Monthly income above 50,000	4	0.4
2.	Monthly income (15,000-50,000	30	3.0
3.	Monthly income (10,000-15,000) Upper middle	216	21.6
4.	Monthly income (3,000-10,000) Lower middle	700	70.6
5.	Monthly income (less than 3,000) Lower	50	5%
	Total	1000	100%

In the present study majority of patients (72.5%) had closed growth plates of their bones. 968 (96.8%) patients presented in the orthopaedic service at the emergency department were trauma victims, only 32 patients (3.2%) presented because of other reasons. Table 4, shows the distribution of patients according to the distance of the site of the accident from Jinnah hospital.

Table 4: Shows the distance of accident site from Jinnah Hospital.

S. No.	Location	No. of Patients	Percentage
1.	Local = 10 km from JHL	688	68.0%
2.	Peripheral = 10-100 km	240	25.0%
3.	Distant = 100 + km	60	7.8%
	Total	968	100%

Most of the patients presented due to injuries were victims of RTA as shown in Table 5.

Table 5: Shows causes of injuries of 968 patients.

S. No.	Cause of Fracture	No. of Patients	Percentage
1.	RTA	478	48.8
2.	Domestic	200	21.0
3.	Work	160	16.1
4.	Sports	110	12
5.	Firearm	14	2.0
6.	Miscellaneous	6	0.5
	Total	968	100%

The type of roads on which the accidents took place were non-metalloid 16 (3.3%), city roads 401 (83%), highways / express ways 39 (8.15%), and motorway 22 (4.6%).

Majority of patients in this study presented with single bone fracture as shown in Table 6.

Table 6:
Shows distribution of patients according to the number of bones broken (N = 925).

S. No.	Number of Bones Fractured	No. of Patients	Per-centage
1.	Pt. with Single bone fracture	731	79
2.	" " Two " "	132	14.3
3.	" " Three " "	41	4.4
4.	" " Four " "	12	1.4
5.	" " Five " "	9	0.9
	Total	925	100%

In 925 patients 1050 bones were fractured (Table 7). Radius and tibia were the most common bones fractured.

Table 7: Shows distribution of fractures in different bones

S. No.	Bone Involved	No. of Bones	%
1.	Humerus	102	9.71%
2.	Radius	184	17.52%
3.	Ulna	104	9.9%
4.	Hand	104	9.9%
5.	Clavicle	38	3.61%
6.	Scapula	8	0.95%
7.	Ribs	12	1.14%
8.	Vertebra	16	1.52%
9.	Pelvis	19	1.8%
10.	Femur	143	13.6%
11.	Patella	10	0.95%
12.	Tibia	178	16.95%
13.	Fibula	30	2.85%
14.	Ankle	29	2.76%
15.	Foot	71	6.7%
16.	Mandible	2	0.19
	Total	1050	100%

73% fractures were close and 27% were open. Some patients presented with soft tissue injuries without fractures. Total number of soft tissue injuries recorded were 415 and their distribution is given in table 8.

Table 8: Showing distribution of soft tissue injuries (n=415).

S. No.	Soft Tissue Injured	No. of Bones	%
1.	Skin injury	265	63.85
2.	Muscle injury	75	18.07
3.	Nerve injury	33	7.95
4.	Vascular injury	11	2.65
5.	Traumatic amputation	31	7.46
	Total	415	100%

Out of 1000 patients in this study, 494 (49.4%) had received some form of emergency treatment before arriving at Jinnah Hospital. On arrival the physical status of patient as given in Table 9 was that 171 (17.1%) patients were in distress or shock.

Table 9: Shows the physical status of patients on arrival at Jinnah hospital (N = 1000).

S. No.	Patients Status at Arrival	No. of Patients	%
1.	Stable and conceious	829	82.9%
2.	In distress	145	14.5%
3.	Shock	26	2.6%
	Total	1000	

The duration after accident until arriving in the Jinnah Hospital in 90% patients varied from few minutes to 12 hours as given in the Table 10.

Table 10: The distribution of the delay between the injury to presentation of the patient at Jinnah Hospital.

S. No.	Response Time	No. of Patients	%
1.	Upto 6 hours	690	69%
2.	6-12 hours	207	20.7
3.	12-24 hours	87	8.7
4.	24 hours plus	1i6	1.6
	Total	1000	100%

Most of the necessary medicines required during emergency treatment were provided free of charge by the hospital to the patients. However, traction devices, splints, few medicines, implants etc. were purchased by the patients. The cost of acute care at the department of accident and emergency surgery during the first 24 hours was calculated in each patient and the mean of the amount spent are given in Table 11.

Table 11:
Showing mean cost of acute care at the department of accident and emergency department of Jinnah Hospital.

Sr. No.	Cost Arranged by Hospital In Rs.	Cost Arranged by Patient In Rs.	Total In Rs.
Min.	10	135	145
Max.	2500	2800	5300
Mean	1255	1467.5	2722.5

During first 24 hours in the accident and emergency department the treatment provided has been summarized in Table 12 and out come of treatment has been given in Table 13.

Table 12:
Summary of different treatments provided to patients in emergency department.

Sr. No.		
1.	No procedure	57
2.	Dressing + stitches + splints	415
3.	Soft tissue procedures Amputations	
	Arthrotomy, Tenden repair	15
4.	POP cast	407
5.	External fixation with soft procedures	90
6.	Internal fixations	16
	Total	1000

Table 13:
Shows outcome of treatment at accident and emergency department.

Sr. No.	Outcome	No. of Patients	%
1.	Treated and diacharged	580	58
2.	Admitted	386	38.6
3.	LAMA	12	1.2
4.	Refered to other department	22	2.2
	Total	1000	100%

DISCUSSION

The Harvard School of Public Health , World Health Organization and the World Bank with collaborations of many private foundations have performed a comprehensive analysis of the current status and projected changes by the year 2020 for major diseases and injuries affecting world population. This survey entitled, The Global Burden of Diseases and Injury Series gives the first clear picture of the world's evolving health needs from the year 1990-2020. Project developed a new standardized measure to analyze, impact of different health problems throughout the world. New measures, called Disability Adjusted Life Years (DALY) have been introduced which in simple term is a lost year of healthy life. Examination of disease burden from fifteen leading causes in the world between 1990-2020 measured in DALYs, reveals that road traffic accidents will move from 9th to 3rd place on the list (Browner, B. D., 1997)

Road traffic accidents result in a significant number of musculoskeletal injuries. Orthopaedic surgeons all over the world are involved in the treatment and rehabilitation of patients with these injuries.

The findings of the present study (n=1000) carried out at Jinnah Hospital during year 2000 has been compared with the study carried out by the author in 1991 at Mayo Hospital, Lahore (n = 40,280).

Table 14:

Sex	Mayo Hospital (1991)	Jinnah Hospital (2000)
Male-Female Ratio	3.8 : 1	3.3 : 1

Table 15:

Age Distribution	Mayo Hospital (1991)	Jinnah Hospital (2000)
Children	25%	26%
Young Adults	60%	61%
Elderly	15%	13%

The above tables show that, although geographic locations of both hospitals is different but the distribution of patients according to the sex and age group is closely similar.

Table 16:

Distribution of patients according to Education	Mayo Hospital	Jinnah Hospital
1. Illiterate	60%	48%
2. Up to 5 year of Education	24%	20%
3. Between 5 to 10 year Education	15%	22%
4. Above 10 year of education	1%	10%

Distribution of patients according to the education grades is not same in both localities. Number of illiterate patients is 20% more at Mayo Hospital than Jinnah Hospital, whereas number of patients with education above Metric is more at Jinnah Hospital.

Table 17:

Mode of Injury	Mayo Hospital (1991)	Jinnah Hospital (2000)
Road Traffic accidents	34%	48%
Fall at home	31%	21%
Violence	10%	2%
Industrial	6%	16%
Sports	2%	12%
Miscellaneous	17%	1%
	100	100

Occurrence of injuries at home and due to violence were more in patients in the Mayo Hospital area, whereas RTA and sports injuries were more in patients presenting at Jinnah Hospital.

Table 18

Distance between site of injury and Hospital	Mayo Hospital	Jinnah Hospital
1. Up to 10 km.	67%	68%
2. Between 10 to 50 km.	23%	25%
3. Above 50 m.	10%	7%

Table 19

Distribution of patients according to Professions	Mayo Hospital (1991)	Jinnah Hospital (2000)
Laborer	25%	35%
House Wives	9%	20%
Students	17%	17%
Business- employed	10%	9%
Miscellaneous / Jobless	39%	18%
	100	100

7% patients presented with multiple injuries at Mayo Hospital, whereas 21% patients presented at Jinnah Hospital had multiple injuries.

As has been shown in the table No. 6 that 21% of the patients presented at Jinnah Hospital had multiple injuries. Number of bones broken in single patient varied from two to five. This factor highlights the need to strengthen the treatment facilities at the accident and emergency department of Jinnah Hospital. As has been mentioned already in the introduction that according to the order of burden of disease on global population, the impact of Traffic Injuries has raised to number three. This alone is an important and alarming fact and require rearrangement of lot of facilities in our hospitals to meet the need of the patients.

The cost of emergency treatment of each trauma victim (Definitive treatment carried out after admission which is much more expansive than the emergency treatment not included) as calculated is Rs. 2722.50. This shows that to provide free emergency treatment to trauma

victims a budget of approximately Rs. three million is required for each 1000 patients.

As has been agreed by the policy makers that without making better arraignments at the higher level, improvements at lower level remain meaningless, it is proposed that better policies regarding prevention of accidents and treatment of trauma victims may be developed at federal, provincial and local hospital level.

CONCLUSIONS AND RECOMMENDATIONS

When measured in terms of years of life lost, traffic accidents rank with cancer and heart disease as one of the most frequent cause of death. To meet this challenge, a quite fundamental rethinking is required. Federal, Provincial, Departmental and Hospital administrations need to acknowledge far more explicitly, than ever before, the need to prevent injuries and to effective treatment of injured. All levels mentioned earlier are expected to improve their policies regarding, exposure control by improving the traffic safety, crash prevention by improving designs of vehicles, roads and traffic, behavior modification of road users, injury control by taking necessary measures, post injury management and rehabilitation of the injured.

4. Injury control by taking necessary measures.
5. Post injury management and rehabilitation of the injured.

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