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Background: Disability following road traffic accident is expected to increase dramatically in developing countries resulting in a decline in the size of the labour force. Adolescents and young adults are at the greatest risk of limb injury resulting from road traffic accidents. The objective of the study was to identify patterns of major limb trauma based on the definition given by the WHO scientific group.

Methods: This audit was conducted by the author who recorded the relevant findings on every patient that was referred to the orthopaedic department between October 1st 2004 and April 31st 2007.

Results: The results of a two and a half year audit (2004 -2007) made in the Eastern Ethiopia are reported. During this period a total of 1487 patients were managed in our orthopaedic department, of whom 1248 had suffered major limb trauma. Of these 1012 were males (68%) and 475 females (32%) giving a ratio of approximately 2 to 1. The majority 883 (70%) were between the age of 15 and 54 years. Fractures formed the largest group 1044 (83%), followed by amputation 68 (6%), open wounds 58 (5%), dislocation 52 (4%), crush injuries 10 (0.8%) and neurovascular injuries 16 (1%). There were no cases of burns to the extremities in the study period. The commonest causes of injury were road traffic accident (RTA's) 533 (43%), a fall in 444 (35%), machine and tools in 246 (20%). Suggestions are made as how best to reduce the size of this problem.

Introduction

Road traffic accidents are among the top ten causes of mortality and the disease burden. Disability following road traffic accident is expected to increase dramatically in developing countries resulting in a decline in the size of the labour force. Adolescents and young adults are at the greatest risk of limb injury resulting from road traffic accidents^{1,3}. The global health burden of injuries in the year 2020 is projected to be equal to that of communicable diseases, and to be even greater in some developing countries. Injury related problems are expected to be higher in Ethiopia due to recent increase in industrialization, road traffic and the use of unsafe technology and working conditions^{2,3,4}. Out of all musculoskeletal injuries nearly 50% are to the upper limb and 36% of injuries to the lower limb (RR = 1.4)³. Of all injuries upper limb fracture accounts for 12% and lower limb fractures for 10% (RR = 1.2). RTA's, fall, machine and tool injuries in this decreasing order of frequency are the leading causes of limb injuries^{3,4,5}. Trauma caused 22% of major upper limb amputations and 18% of major lower limb amputations (RR = 1.2). RTA's, fall, machine and tools were respectively the causes of 45%, 11% and 9% of major limb amputations⁶.

Operational definition: The definition of major (severe) limb trauma according to a WHO scientific group includes all fractures, dislocation, crush injuries, open wounds, amputations, burns and neurovascular injuries to the extremities¹. Spine, mandibular, nasal and skull fractures are not included in the definition and are hence excluded from my audit. The objective of the study was to identify patterns of major limb trauma based on the definition given by the WHO scientific group.

Patients and Methods

Dilchora Hospital is the only government health facility providing specialised orthopaedic and trauma management in the Eastern part of Ethiopia which has a population (catchment area) of

about 5 million. The hospital has 230 beds, of which 24 are for orthopaedic and trauma patients. There is only one specialist orthopaedic surgeon available, but general surgeons and general practitioners provide some orthopaedic and trauma care. This audit was conducted by the author who recorded the relevant findings on every patient that was referred to the orthopaedic department between October 1st 2004 and April 31st 2007.

Results

During the two and half years 1487 (1012 males 68%, 475 females 32%) were managed by the author. This is a sex ratio of 2 to 1. Of this grand total, 1248 (84%) were considered to have suffered major limb trauma (Table 1) and 883 (70%) were between the ages of 15 and 54 years (Table 2). The upper limb was injured in 749 (60%) and the lower limb was injured in 499 (40%). The categories of injuries are summarised in Table 3, and to note there were no burn injuries. The responsible agents of injuries are shown in Table 4 and as seen RTA's were the leading cause.

Table 1. Distribution of Limb Trauma Cases by Gender and Severity of Injury.

Gender	All Cases of Limb Trauma		Total
	Major	Minor	
Male	850 (57%)	162 (11%)	1012 (68%)
Female	398 (27%)	77 (5%)	475 (32%)
Total	1248 (84%)	239 (16%)	1487 (100%)

Table 2. Distribution of Limb Trauma Patients by Age and Severity of Injury.

Age In Years	All Cases Of Limb Trauma		Total
	Major	Minor	
0-4	39 (3%)	6 (3%)	45 (3%)
5-14	173 (14%)	39 (16%)	212 (14%)
15-24	234 (18%)	61 (21%)	295 (20%)
25-34	274 (22%)	66 (28%)	340 (23%)
35-44	239 (19%)	44 (18%)	283 (19%)
45-54	136 (18%)	10 (4%)	146 (10%)
55-64	58 (5%)	10 (4%)	68 (5%)
65-74	47 (4%)	3 (1%)	50 (3%)
75-84	42 (3%)	-	40 (2%)
>84	6 (0.6%)	-	8 (1%)
Total	1248 (100%)	239 (100%)	1487 (100%)

Table 3. Distribution of cases of major (severe) limb trauma by location and nature of injury.

Nature Of Injury	Location of Major Limb Trauma		Total
	UET	LET	
Fracture (#)	616 (49%)	428 (34%)	1044 (83%)
Open wound	26 (2%)	32 (3%)	58 (5%)
Amputation	56 (5%)	12 (1%)	68 (6%)
Dislocation	37 (3%)	15 (1%)	52 (4%)
Crush	3 (0.2%)	7 (0.6%)	10 (0.8%)
Neurovascular	11 (1%)	5 (0.4%)	17 (1%)
Burn	-	-	-
Total	749 (60%)	499 (40%)	1248 (100%)

Table 4. Distribution of Major Limb Trauma Cases by Mechanism and Location of Trauma.

Mechanism of injury	Location of major limb trauma		Total
	UET	LET	
RTA	219 (29%)	314 (63%)	533 (43%)
Fall	329 (44%)	115 (23%)	444 (35%)
Machine and tools	196 (26%)	50 (10%)	246 (20%)
Bullet / blast injury	5 (0.7%)	20 (4%)	25 (2%)
Burn	-	-	-
Total	749 (100%)	499 (100%)	1248 (100%)

Discussion

The results of this audit showed that the majority (70%) of major limb trauma occurred in the 15 and 54 years age group. People of working age are largely affected by major limb trauma and this finding is similar to that reported by a WHO scientific group and by others authors^{1,3,4}. Major limb trauma occurred more in the upper limb than the lower limb (RR =1.5). This is consistent with other reports^{3,5,6}. Fracture, dislocations and traumatic amputations accounted for the majority (93%) of the diagnosis in the identified patterns of major limb injuries. Previous study at TAUH agrees with the finding⁴. RTA, fall accidents, machine and tools in their order of decreasing frequency are the leading causes of major limb trauma in the Eastern part of Ethiopia. Many reports showed similar results^{1,3,4,5,6}. These are preventable causes seriously affecting the labour forces in our country. Improving roads (design, construction, complete separation of pedestrians from vehicles), traffic education of drivers and the public in general, establishment and enforcement of health and safety measures at work (e.g machine guards, protective gear) are suggested to be implemented to reduce the size of the problem.

Conclusion and Recommendations

To reduce the economic impacts of major limb trauma I suggest:

1. Appropriate measures on preventable causes must immediately be implemented by all those involved.
2. A nation wide study should be conducted which should lead to the establishment of an organised health information system on the incidence and cost of trauma and thus allow further development of preventive measures.

Acknowledgement

I would like to express my thanks to Professor Geoffrey Walker FRCS for his help in the preparation of this manuscript. The cooperation of Dr. Tezera Chaka, Head - Department of Orthopaedic Surgery, AAU, is appreciated.

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