

## *Pattern of Injuries from Road Traffic Accidents Among Children*

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### **Summary**

**Ebong, W. W. (1980).** *Nigerian Journal of Paediatrics*, 7(1), 20. **Pattern of Injuries from Road Traffic Accidents Among Children.** One hundred and ninety-four cases of traffic injuries seen during a 12-month period in children under fifteen years of age were studied prospectively. Four-fifths of the subjects were pedestrians, most of whom were struck down by cars or lorries. A third of the injuries were multiple. Fractures of bones were the commonest injuries, and the lower limb was the commonest body area to be injured. 89.5 per cent of the victims survived the accident.

ACCIDENTS have now replaced infectious diseases as the major cause of death in children in Western Europe and North America (Gissane and Bull, 1962; MacKay, 1973). Since an increasing proportion of these accidents occur on the roads, there have been numerous reports from these technically developed countries on the incidence (Slatis, 1967), the mode of injury (Ekstrom, Gastrin and Qvist, 1966) and the types of injury sustained (Moore and Lilienfeld, 1960) from traffic accidents.

In developing African countries however, infections and malnutrition are the major causes of morbidity and mortality in childhood (Hendrickse, 1967), while traffic accidents are low down on the list of medical priorities. Thus, studies on traffic accidents are unfortunately almost completely neglected, and consequently, basic data which are essential in planning for control or prevention and for comparative studies both within tropical African countries and between the latter coun-

tries and the industrialised nations are almost non-existent (*Journal of Tropical Paediatrics*, 1959; Sinnette, 1969).

This paper describes the pattern of injuries sustained in road traffic accidents by children as seen at the University College Hospital (UCH), Ibadan, during a twelve-month period.

### **Materials and Methods**

A prospective study was undertaken of all patients with skeletal and associated soft tissue injuries seen in the Casualty Department or Fracture Clinic, UCH, Ibadan, in the twelve-month period beginning March 1, 1975 and ending February 29, 1976. The general pattern of these injuries has been reported elsewhere (Ebong, 1977; Ebong, 1978a; Ebong, 1978b). Of the 2,579 patients seen during the period-826 were injured in traffic accidents. One hundred and ninety-four (23.5 per cent) of the road,

traffic victims were children aged between 1 and 14 years. Analysis of the data on these children provides the basis of this report.

**Results**

*Incidence*

There were 100 males and 94 females (Table I). Eighty-six (86 per cent) of the 100 boys were aged between 5 and 14 years, and 83 (88.3 per cent) of the 94 girls were in the same age group. Thus, a majority of those involved in traffic accidents were in the school age population.

TABLE I

*Age and Sex Distribution of 826 Traffic Casualties Seen at UCH, Ibadan*

Age (Years)	Male	Female	Per cent of Total
Under 1	1	0	0.5
1-2	2	1	1.5
3-4	11	10	10.8
5-6	16	20	18.6
7-8	15	17	16.5
9-10	20	21	21.1
11-12	21	9	15.5
13-14	14	16	15.5
Total	100	94	-
15 and above	512	120	-
Grand Total	612	214	-

There was no significant monthly difference in the distribution (Fig. 1), but the largest number of accidents occurred during the holiday and festive month of December (28 cases) and the fewest in March (11 cases). Similarly, Saturdays, Sundays and Wednesdays were the days when most of the injuries commonly occurred, while Tuesdays were the least common days of occurrence (Fig. 2). Ninety per cent of the injuries

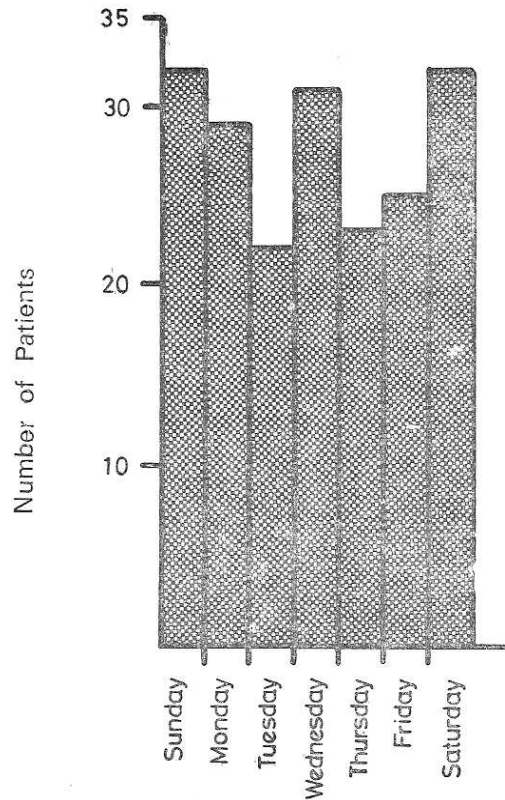


Fig. 1. Monthly Distribution of Traffic Injuries in Ibadan Children

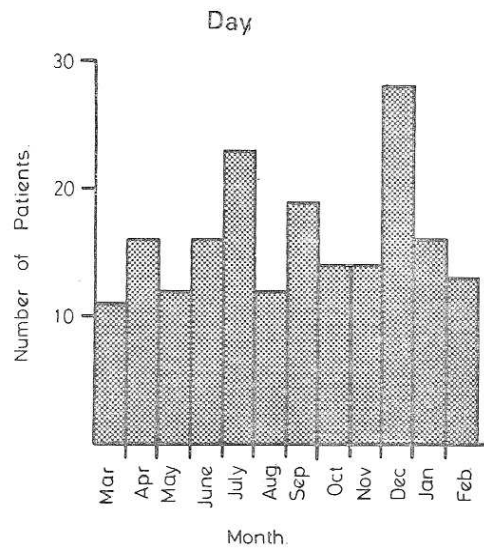


Fig. 2. Day of Injury of Traffic Casualties in Children.

occurred during the day, between 6 a.m. and 6 p.m., the peak periods coinciding with the times of going to, and returning from school.

#### *Arrival at hospital*

All but one of the injured children were seen in the Casualty Department, while the remaining child was referred from another hospital to the Fracture Clinic. One hundred and seventy-two victims (88.7 per cent) reported on the day of injury and 185 (95.4 per cent) were seen within 48 hours of the accident. One child delayed in attending the hospital for six weeks after the injury. The largest number of patients (Fig. 3) was seen on Mondays (34 cases), followed by Wednesdays (30 cases) and the fewest on Tuesdays and Thursdays (24 cases on each day).

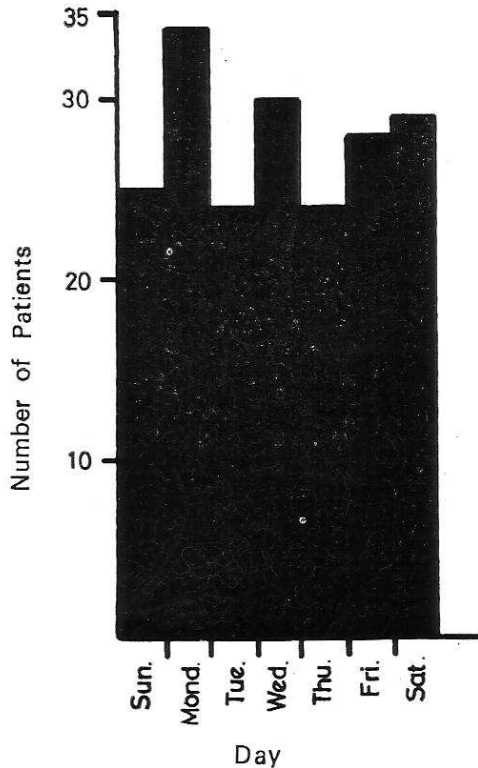


Fig. 3 Day of First Presentation of Children Injured in Traffic Accidents.

#### *Mode of transport*

Table II shows the number of the injured according to the mode of transport. One hundred and sixty-five (84.6 per cent) of the 194 children were pedestrians; very few were in cars or lorries, or on motorcycles or pedal cycles. The sex incidence of children injured as pedestrians was similar, in contrast with the marked male

TABLE II

*Number of Injured Victims According to Mode of Transport*

Mode of Transport	Age (Years)			Per cent of total < 15
	< 15	15 and above	Total	
Pedestrian	165	154	319	51.7
In car or lorry	18	324	342	5.3
On motorcycle	3	138	141	2.1
On pedal cycle	8	16	24	33.3
Total	194	632	826	23.5

preponderance of pedestrians aged 15 years and above (Table III). Male children injured as car or lorry occupants outnumbered their female counterparts by two to one. The number of children injured whilst on motorcycle or pedal cycle was very small.

#### *The injuries*

The injuries were single in 131 patients and multiple in 63 (32.3 per cent); few had more than two injuries each and the maximum number of injuries sustained by a person was four. Altogether, the 194 children sustained 278 injuries (Table IV) which included fractures (210), dislocations (3), large soft tissue wounds (32), cerebral concussion (15), cerebral contusion (8) and closed abdominal trauma (5). Thirty-two of the fractures were open injuries. The lower extremity was the commonest body area to be injured (Table V). Femoral shaft, followed by both bones of the leg, were the commonest bones to be fractured.

TABLE III

Age and Sex Distribution of Pedestrian Victims of Traffic Casualties in Ibadan

Age (years)	Male	Female	Total
Under 1	1	0	1
1-2	0	1	1
3-4	11	8	19
5-6	16	19	35
7-8	14	15	29
9-10	17	18	35
11-12	15	9	24
13-14	8	13	21
Under 15	82	83	165 (51.7 per cent)
15 and above	106	48	154 (48.3 per cent)
Total	188	131	319 (100 per cent)

*Pedestrian accidents.*

One hundred and sixty-five (84.6 per cent) of the 194 children involved in accidents were pedestrians (Table II). Their sex incidence was about even. However, girls aged between 3 and 10 years and boys aged between 3 and 12 years predominated. Three-quarters of the children were struck down by cars or lorries, just over a fifth by motorcycles and the rest were knocked down by pedal cycles. The body area most frequently injured was the lower limb, followed by the head and neck and the upper limb; thoracic and abdominal injuries were rarely encountered (Table V). In the lower limb, fracture of the shaft of the femur and of both bones of the leg were the commonest injuries. The most frequent head injury was cerebral concussion, followed by skull fracture and cerebral contusion; in the upper extremity, fracture of the clavicle predominated.

*Car or lorry occupants*

Eighteen (9.2 per cent) of the children were injured as car or lorry occupants (Table II). A

TABLE IV

Types of Injuries Sustained in Traffic Accidents by Ibadan Children

A. Head, Spine and Trunk	Number of Injuries
Fracture-skull	10 (5 open)
Fracture-facial bones	6 (1 open)
Fracture-ribs	2
Fracture-pelvis	5
Cerebral concussion	15
Cerebral contusion	8
Intra-abdominal trauma	5
Lung collapse	1
Vaginal laceration	2
Large wound	11
Total	65
B. Upper Limb	
Fracture-clavicle	18
Fracture-humerus (neck)	5
Fracture-humerus (shaft)	7
Fracture-humerus (distal end)	4
Colles' fracture	1
Fracture-radius alone	5
Fracture-ulna alone	4 (1 open)
Fracture-both bones forearm (NOT Colles' or Smith's)	8 (1 open)
Fracture-carpal bone	1
Fracture-metacarpal bone	1
Dislocation sternoclavicular joint	1
Large wound	1
Total	56
C. Lower Limbs	
Fracture-femur (neck)	1
Fracture-femur (shaft)	61 (1 open)
Fracture-femur (distal end)	1
Fracture-both bones, leg	45 (19 open)
Fracture-tibia alone	17 (1 open)
Fracture-fibula alone	1
Fracture-ankle (malleolus)	2 (both open)
Fracture-tarsal bones	2
Fracture-metatarsal	1 (open)
Fracture-one or more phalanges	2 (1 open)
Dislocation ankle	2 (both open)
Burn	1
Torn ligament	1
Large wound	20
Total	157
Total number of injuries sustained by 194 children	278

majority were aged between 11 and 14 years, and males outnumbered females by two to one. The 18 children sustained a total of 23 injuries; nearly three-quarters of these were fractures of long bones of the extremities. Two children each had cerebral concussion and large soft tissue

TABLE V

*Area of Body Injured in Traffic Accidents, According to Mode of Transport*

<i>Mode of Transport</i>	<i>Head and neck</i>	<i>Thorax</i>	<i>Abdomen</i>	<i>Spine and Pelvis</i>	<i>Upper Limb</i>	<i>Lower Limb</i>	<i>Number of patients</i>
All cases	25.8	1.5	2.6	3.6	28.9	80.9	194
Pedestrians	26.1	1.8	3.0	3.6	24.8	84.2	165
Car/Lorry passengers	22.2	0	0	5.6	44.4	55.6	18

wounds; and one each had fracture of the pelvis and facial bone.

#### *Mortality*

Three deaths (1.5 per cent) were recorded in pedestrians who were struck down by cars. One was a five-year old girl; the others were boys aged 6 and 12 years, respectively. The girl and the six-year old boy died of cerebral contusion and closed abdominal trauma 2 and 19 hours, respectively, after arrival in the casualty department; the other boy, a known sickler (HbS), died of ruptured spleen and bilateral femoral shaft fractures 12 hours after admission. The sickler had sustained 3 injuries, while the other deceased had 4 injuries each.

#### **Discussion**

Children formed a significantly higher proportion (23.5 per cent) of traffic victims in this series compared with reports from the developed nations. In the latter countries, the reported proportion is 6.2 per cent in Birmingham (MacKay, 1967), 10.9 per cent in Australia (Jamieson and Tait, 1966), and 16.3 per cent in Sweden (Slatis, 1967). The high incidence of children in our series probably to be explained by their larger proportion in the population.

A striking feature in our series is the marked preponderance of pedestrians and the very few numbers of car or lorry occupants injured. This finding contrasts with reports from elsewhere in which car occupants predominate (Ryan, 1969);

it is consistent with the view that in developing countries unprotected road users run a higher risk of injury and death than protected road users (Giraldo, 1973). This preponderance of pedestrians is largely a function of exposure, and also a consequence of the attitude of many of the drivers towards children crossing the road.

Children will benefit from all general measures aimed at traffic accident prevention like improved road condition, speed limit and other forms of legislation as well as stringent judicial attitudes. Special measures that will be of particular importance to our children include intensive health education on the safe use of highways by children, on the importance of providing guardians for young children in the street by the parents and on the need to drive with due consideration for other road users by the drivers.

#### **References**

- Ebong, W. W. (1977). Pattern of casualty admission at the University College Hospital, Ibadan. In: *Care of the Injured* pp. 33-40. Published by the West African College of Surgeons.
- (1978a). Pattern of bone injury in Ibadan. *Int. Surg.* **63**, 14-17.
- (1978b). The pattern of fractures and dislocations in Western Nigeria. *Injury*, **9**, 221-224.
- Ekstrom, G., Gastrin, U. and Qvist, O. (1966). Traffic accidents among children. Proceedings of the second congress of the International Association of Accident and Traffic Medicine, Stockholm, Sweden.
- Giraldo, C. A. (1973). Fatal traffic accidents in Medellin, Columbia, South America. In: Proceedings of the International Conference on biokinetics of impacts, p. 59, Amsterdam.
- Gissane, W. and Bull, J. (1962). Injuries from accidents. *Practitioner*, **188**, 489-497.

- Hendrickse, R. G. (1967). Major causes of death in infancy and childhood at University College Hospital, Ibadan. In: Colloquium on living conditions of the child in rural environment in Africa, pp. 123-127, Institut de Pediatric Sociale, Paris.
- Jamieson, K. G. and Tait, I. (1966). Traffic injury in Brisbane, Canberra, Australia. National Health and Medical Research Council Special Report Series **No. 13**.
- Journal of Tropical Pediatrics (1959). Accidents in the tropical environment. *J. trop. Pediat.*, **5**, 33-34.
- MacKay, G. M. (1967). Road accident research. Project report **No. 4**, Human engineering section, Department of Transport and Environmental Planning, University of Birmingham, England.
- (1973). The epidemiology of injury—a review. In: Proceedings of the International conference on the biokinetics of impact, p. 11, Amsterdam.
- Moore, J. O. and Lillienfeld, R. (1960). The child in injury—producing automobile accidents. *Traffic Safety Res. Rev.*, **4**, 16.
- Ryan, G. A. (1969). Children in traffic accidents. *Pediatrics. Suppl.*, **44**, 847-854.
- Sinnette, C. H. (1969). The pattern of childhood accidents in South-western Nigeria. *Bull. W.H.O.*, **41**, 905-914.
- Slatis, P. (1967). Injuries on road traffic accidents. *Ann. Chir. Gynaec. Fenn. (Suppl.)*, **56**, 150.