

# Preliminary survey of aetiological factors in femoral shaft fractures

*'there is occasions and causes why and wherefore in  
all things'*

Shakespeare, Henry V, Act V.

THIS PRESENTATION is by no means an exhaustive study, merely a pilot survey, undertaken to review briefly factors contributing to femoral shaft fractures. Available data considered noteworthy are here entered into the record, providing thereby a basis for further comparative study at a later date.

The series comprises the first one hundred cases of femoral shaft fractures admitted to the orthopaedic service of this hospital. The University Hospital, situated at the new township of Petaling Jaya, does not serve any stipulated demographic zone of the general population. Instead, the series contains cases of countrywide distribution though of somewhat modest number.

This article is based on information obtained from the history sheets of all the cases as well as those acquired from personal interviews of 61 patients shortly prior to writing this paper. A total of one hundred cases, involving 103 fractures, two cases having sustained bilateral fractures, spent a total period of 6,439 days of hospitalisation, the mean average being 64.4 days. Forty-eight cases having coincident injuries included 42 cases with fractures elsewhere and six with multiple soft tissue injuries.

The data obtained are organised in tabular form to

by *Q.M. Iqbal*

FRCS

Lecturer,

Department of Orthopaedic Surgery,

University of Malaya,

Kuala Lumpur

demonstrate the various parameters involved in the aetiological factors. It appears from the tables that shaft-of-femur fractures are essentially the results of accidents involving severe trauma. The lesion is confined mainly to young males (92) and is more common among road users (71) both motorised (60) and pedestrian (11). Domestic accidents accounted for 15 cases, industrial accidents for nine cases and miscellaneous causes for the remaining five cases. Of the last five cases, only one case was the result of spontaneous fracture through secondary malignant deposit and another, a fracture in a case of pseudohypertrophic muscular dystrophy, the injury being sustained while the patient was being massaged. Sixty-eight cases occurred on weekdays. Public holidays and weekends accounted for 28 cases, the remaining four being unknown. Right sided lesions predominate by taking a toll in 64 cases, the remainder being left sided.

The ethnic bias is towards the Chinese who

accounted for 56, followed by Indians 24, Malays 17 and others three cases, in that order.

In general, the time of occurrence of fractures seem to maintain an even plateau throughout the working hours. Among the road accidents, there are two definite periods when the injury tends to occur more frequently, the periods coinciding roughly with the peak traffic hours.

**Table No. 1**  
**CAUSE OF FRACTURE**  
100 CASES

CAUSE OF FRACTURE		NO. OF CASES	
Road Traffic Accident	71	28.2 years	
Domestic accidents	15	28.6 years	
Industrial accidents	9	37.0 years	
Other causes	5	30.8 years	
<b>TOTAL</b>	<b>100</b>		

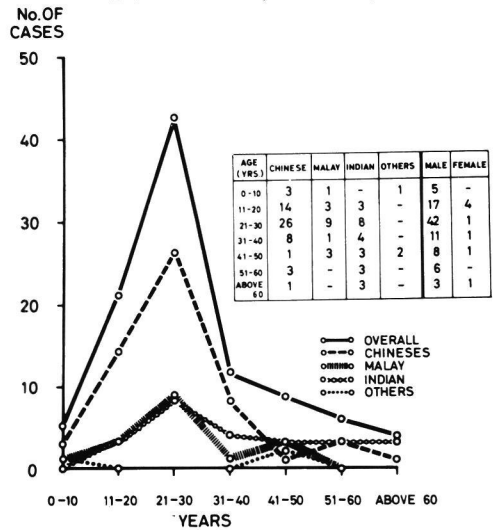
In the sample of cases involved in road accidents, the injury occurs more frequently in built-up areas where 31 of the accidents occurred. Accidents in rural areas/roads accounted for 18 and highways seven cases. Twenty-six cases in this series could not be accounted for. Only five out of the 71 cases confessed to have taken alcohol before the accident and none in the series, both road accidents and industrial injuries, had employed any form of protectives, restrainers or harness. Accidents following use of two wheeled vehicles totalling 52 cases far exceeded those due to car accidents which took a toll of eight cases only.

**Discussion:**

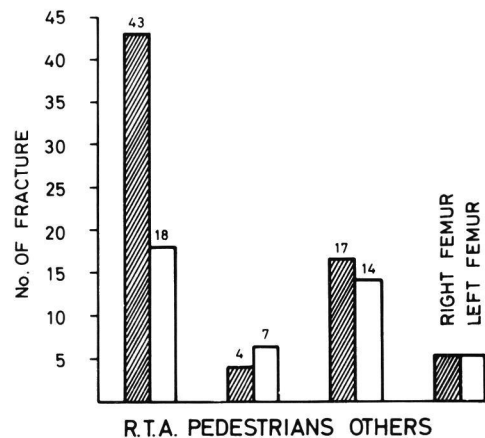
From the data available, a definite demographic concentration in males between the ages of 20s and 30s, essentially the wage earners, appear apparent, the bulk of toll being taken by road users. In the motorised cases, the predominance of the injury in youths, in built-up areas, exhibiting diurnal variations during peak traffic hours, suggests the motivation of use of transport in most cases, to be pursuit of occupational activity rather than irresponsible youthful use of high speed vehicles. The rise in the peak of accidents between 6 pm – 9 pm is possibly the result of late homecoming, coupled with the hazards of road illumination.

The predisposition of the lesion to affect the right side in the road accident series, in country where traffic flows on the left, is presumably the result of

**Table No. 2**  
**AGE, SEX & ETHNIC**  
**DISTRIBUTION (100 CASES).**



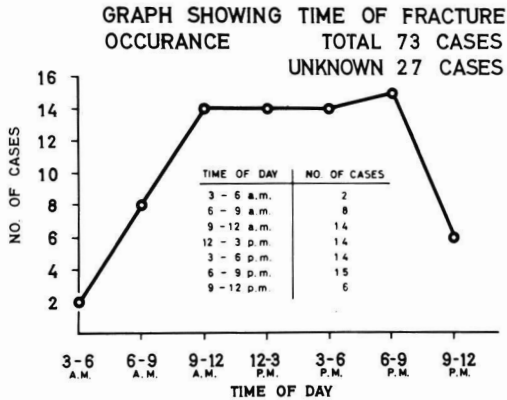
**Table No. 3**  
**SIDE OF FRACTURE**



either head-on collision or overtaking from either side or accidents at road junctions, a hypothesis substantiated to some extent by tables nos. 3 and 8 but needs further investigation. The complete lack of any form of physical restrainers in either road accident or industrial series is a practice deprecated for some time among the more technocratic countries

## FEMORAL SHAFT FRACTURES

**Table No. 4**

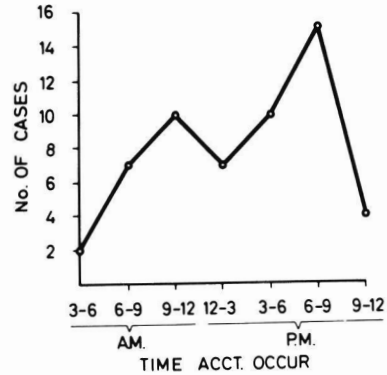


**Table No. 5**

### TIME OF DAY ROAD TRAFFIC ACCIDENT OCCUR

TIME OF DAY	No. OF CASES
3 - 6 a.m.	2
6 - 9 a.m.	7
9 - 12 a.m.	10
12 - 3 p.m.	7
3 - 6 p.m.	10
6 - 9 p.m.	15
9 - 12 p.m.	4

# 16 CASES NOT KNOWN



**Table No. 6.**

### SITE OF ROAD TRAFFIC ACCIDENTS

SITE	NO. OF CASES
Built up areas	31
Rural area/road	18
Highway	7
<b>TOTAL</b>	<b>56</b>

15 cases unaccountable

Only five cases gave history of taking alcohol before accident occurred. None of the cases among the road accident series had used any form of protectives.

and the compulsory use of which has been long since legislated.

It appears, therefore, that accidents in general and road accidents in particular, tend to exhibit certain physical variables in respect to age, sex, ethnic distribution, diurnal variation, etc., comparable to the biological variables of conventional disease. Furthermore, should the traditional concept of host, agent and environmental interplay as a cause of lesion be applied to this series, it would follow that preventive measures, when contemplated, must encompass all the three parameters. The host remains the prime medical responsibility. By his training and insight into biological science and by caring for the physical and psychological integrity of the host, the physician helps keep factors involved in human variables to an optimum.

The recognition and understanding of the limits of human perception and ability, both physical and psychological, by the science of ergonomics and the application of such knowledge in the designing and

**Table No. 7**

### CLASSIFICATION OF CASES WITH AGES IN ROAD ACCIDENT SERIES

Patient	C	M	I	O	Total	Average Age
Car driver	3	1	—	—	4	22.3 years
Motorcycle rider	21	4	7	—	32	28.7 years
Bicycle rider	2	1	3	—	6	29.5 years
Passenger/pillion	9	5	3	1	18	20.1 years
Pedestrian	4	2	4	1	11	39.6 years
<b>Total</b>	<b>39</b>	<b>13</b>	<b>17</b>	<b>2</b>		

C = Chinese; M = Malay; I = Indian; O = Others.

Table no. 8

**TYPE OF VEHICLE AND CAUSE OF ACCIDENT  
IN ROAD ACCIDENTS**

Vehicle	No. & cause of accident					Total
	H.O.	R.J.	O.F.	Sk.	Uk.	
Motorcycle	18	8	7	11	2	46
Bicycle	1	—	3	2	—	6
Cars	2	—	1	3	2	8
						60
						† 11

pedestrians

H.O. = head on collision  
 R.J. = accident at road junction  
 O.N. = onflow traffic accident  
 Sk = skidding  
 Uk = unknown

manufacture of vehicles, enable constant modification and alterations in vehicular designs which help curtail some of the physical basis of accidents. It is for the last factor, a rapidly changing

environment of high speed vehicles, of highways and expressways, of traffic lights and traffic regulations, of road illumination and road surfaces (to mention but a few) that we need to invoke a close cooperation and collaboration between different branches of planning and engineering with biological sciences. To be effective, such an organisation needs to be at local, state and national level.

Without further detailed and factual information, it is not possible to state if this represents the national trend today but in view of the nationwide road network envisaged and rapid urbanisation already on the way, unless adequate steps are taken in time, this may well be the picture of tomorrow.

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5. Shakespeare, Henry V, Act V.