

# Patterns of Injuries After Road Traffic Crashes Involving Bodabodas

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## Abstract

### Background

Trauma is a leading cause of morbidity and mortality in Africa. Bodabodas are a main form of transport in Kampala and are becoming a major cause of road traffic crashes. We examined the pattern of injuries attributed to bodabodas.

### Patients and Methods

We retrospectively reviewed the charts of all trauma patients who presented between June and August 2008 to the emergency ward of the Mulago hospital in Kampala and identified the patient characteristics and the nature of injuries sustained.

### Results

Road Traffic Crashes (RTC's) were the leading cause of trauma and bodabodas were involved in 41% of all trauma patients. Majority of the patients were young males below the age of 40. The commonest injuries were fractures, cranial trauma and soft tissue injuries. The lower limbs bore the brunt of the injuries.

### Conclusions

Injuries seen as a result of bodabodas constitute a majority of trauma cases and are hence a pressing problem in need of urgent solutions. The relevant authorities should ensure preparedness of the health system to cater for the care of these patients.

## Background

Globally, trauma resulting from road traffic crashes is a major cause of death and disability with majority occurring in developing countries (1). This is partly due to increased motorization but also due to failure by authorities to enforce necessary regulations.

Bodaboda is a term that refers to both bicycles and small motorcycles with low engine capacity. It is a corruption of the word 'border border' derived from the fact that the vehicles were first used to ferry passengers across the Kenya-Uganda border.

Bodabodas are a major form of transport in the city of Kampala and in other towns in East Africa. Kampala is a rapidly growing urban centre with majority of the city and its suburbs not well serviced by the shared taxis that constitute the other major form of transport. This forces the bulk of the population to rely on bodabodas which are also faster and meander better through traffic compared to the taxis. Since the introduction of bodabodas in Kampala in 2001, the proportion of accidents attributable to them has been increasing annually and currently a leading cause of accident scene fatalities in Kampala (2).

Road traffic crashes generally affect young people and this is most evident in bodaboda crashes because the

bodabodas business is predominated by youths as a means to a livelihood (3,4). In earlier studies in Uganda, bodaboda injuries accounted for 14.5% of patients sustaining long bone fractures and 25.6% of all tibial fractures (5,6).

Mulago has borne the brunt of managing patients with injuries caused by bodabodas since it is the most equipped public hospital in Kampala.

This study aimed at describing the magnitude and variety of trauma seen as a result of crashes involving bodabodas. We hypothesised that we would note an increase in the number of casualties compared to the figures published earlier in the decade and that majority of these injuries would affect the limbs especially the lower limbs. A retrospective review accorded us the opportunity to quickly, and effectively evaluate the current patterns of injuries attributable to bodabodas. Documenting the injuries will highlight the patterns of trauma that will confront the surgeon today. It will also highlight the changes in patterns of trauma in the last decade. This data will be essential to policy makers in re-evaluating the different resource allocation requirements for preventive curative and rehabilitation services.

Whereas the Galukande (7) study attempted to highlight some of the patterns of bodaboda injuries, this current

study investigated the magnitude of the problem and highlights the changes in these patterns in the last decade.

## Patients and Methods

This retrospective study included all patients admitted for trauma at Mulago hospital's emergency surgical ward in the three month period ending 30th August 2008. Patients with pathological fractures and burns were excluded. Cases that were seen as referrals after initial management at peripheral centres were also included. Charts initially retrieved for perusal that were found to be ineligible were excluded. Mulago is the National Teaching and Referral Hospital serving as the apex of medical care in Uganda and the teaching hospital for Makerere University. Mulago hospital also receives acute trauma cases that occur in the greater Kampala region and beyond. Patients seen at the Accident and Emergency for trauma are evaluated and those found to have major trauma are admitted to the Emergency ward. Here they are attended to by the residents and consultants in the various surgical fields. The patients were identified from the patient log in the emergency ward and their files retrieved from the records department and perused by the first author (JK). The demographic data was retrieved from the admission face sheet of the charts and the cause of trauma and diagnosis was retrieved from the case notes as recorded by the admitting doctor and the review notes of the resident on call.

A road traffic crash was deemed to have involved a bodaboda if the patient was hit by a bodaboda, was a passenger or a rider of a bodaboda (Fig. 1). It was difficult to divide the groups of patients into riders, passengers or pedestrians as this information was not clearly recorded in majority of the files perused.

The lower limb was considered as the pelvic girdle and the rest of the lower limb and the upper limb included the pectoral girdle. Injuries to the face and head including concussions were classified as head injuries. Injuries involving the thorax including rib fractures and injuries to the thoracic viscera were classified as chest injuries. Injuries to the abdominal wall and abdominal and pelvic

viscera were classified as abdominal injuries. The data was collected using a research tool designed for that purpose and later keyed in to a computer using MS Excel and for proportions.

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Fig. 1. A bodaboda rider with 3 passengers

## Results

Nine hundred and twenty of 1500 (61.4%) files identified from the admission log for possible perusal were retrieved. Road traffic crashes (RTCs) contributed 51% (n=470) of all trauma patients seen. Of the patients admitted after RTCs, 73 % were due to bodaboda accidents (n=344).

Males were involved in 81% of the cases with a male to female ratio of 4.4:1. The peak age was 21-30 years and the average age was 29.1 years. About two thirds of the patients were between 20 and 40 and 85% of patients were below 40 years of age (Figure 1).

Only about 10.4% of patients sustained multiple injuries (n=36). About half of the cases seen were limb fractures (n=163) and 78.53% were closed injuries (n=128). Cranial trauma and soft tissue injuries comprised majority of the remainder (Fig.2).

About three quarters of all limb fractures were in the lower limbs (n=122) with most being the long weight bearing bones. Both limbs were fractured in 10.5% of cases.

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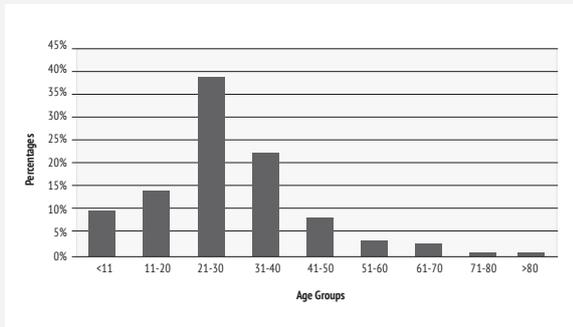


Fig 1 Age Distribution of patients surviving bodaboda trauma

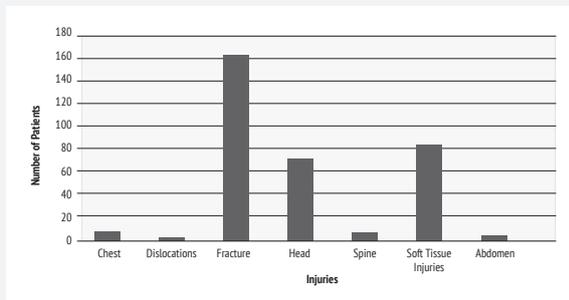


Fig. 2 Pattern of injuries following bodaboda collisions

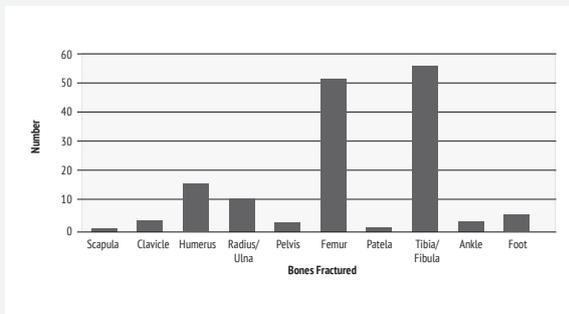


Fig. 3 Distribution of fractures in bodaboda injuries

The leg was involved more than the thigh (Figure 3).

Discussion

Bodabodas were responsible for about three quarters of all injuries caused by road traffic crashes (RTCs). This is a very high figure when compared to other countries in the region. A study in Rwanda estimated that motorcycles were responsible for about 30% of all RTC's (8). This exposes the dependence on bodabodas as a form of transport in Kampala and indeed in the rest of Uganda though the Rwanda study included both inpatient and

outpatient data. Our study results depict an evolution of an important public health problem. In 2001 Naddumba found that bodabodas contributed only 25% of all accidents compared to the current 75% (4). This indicates that the number of bodabodas has increased substantially replacing other forms of transport. It may also indicate a lack of proportionate increase in the regulation of the subsector and education of the riders.

Most of the patients admitted due to injuries related to bodabodas were young men under the age of 30. This was the finding of Naddumba in 2001 and Galukande in his 2009 survey (4,7).

Bodaboda riders are prone to injuries when compared to other road users. Most crashes tend to involve collisions with motor vehicles and the unprotected bodaboda riders and passengers bear the brunt of the impact (4).

About one fourth of the injured had cranial trauma. Given the potential grave consequences of head injury, this finding is significant.

Majority of bodaboda riders and their customers do not wear helmets which are protective against cranial trauma (7). In 2001 cranial trauma comprised about 10% of bodaboda trauma patients; our results show that this has increased to 20%. This may be due to an increase in the recklessness of the riders or a reduction in the use of protective helmets. Forensic studies using computer simulation have shown that the passenger on a motorcycle that rams into a vehicle is more likely to suffer severe brain trauma because he is usually thrown over the rider into the vehicle ahead (9). Cyclists and pedestrians are also more likely to suffer more severe cranial trauma when compared to vehicle occupants (10).

Fractures comprised 47% of all injuries. This is comparable to the 41% noted in 2001 but at variance with the high figure of 80% quoted by Galukande (4,7). We found that majority of the fractures were in the lower limb with the leg being more involved. This was also found to be the case in 2001. The lower limbs are relatively exposed with the leg dangling precariously as the bodaboda meanders through traffic.

The leg is hence likely to be caught between vehicles, injured when the bodabodas ram into other vehicles and crushed by the weight of the bodaboda should it fall. Forensic studies have shown that in cases of side impact it is the back seat passenger that bear the brunt of the injury as his lower limbs are crushed between the car and the motorcycles' metallic body (9). Another study has also found that

the likelihood of sustaining lower limb fractures is higher in cyclists and pedestrians due to the impact on the lower limbs by car bumpers (10).

This study had limitations. The lumping together of different groups of patients weakens the study somewhat but this accords the opportunity to review all injuries related to bodabodas. We faced challenges in retrieving the charts identified for perusal and in data collection in the retrieved charts as some had missing entries and pages. A prospective study including all patients involved in bodaboda related crashes with stratification of the various categories of patients would provide additional information.

## Conclusion

Injuries seen as a result of bodabodas constitute a majority of trauma cases. They are a pressing problem and efforts should be made to seek solutions aimed at mitigating this. Rural hospitals in East Africa are ill equipped to handle the current orthopaedic trauma (11). With the expected increase in accidents from the haphazard introduction of bodabodas coupled with poor enforcement of traffic rules, hospitals in the periphery are likely to be overwhelmed by the increased trauma cases. Efforts should be made by the relevant authorities to ensure preparedness of the health system to cater for the effects of introduction of bodabodas in various parts of the country.

## References

1. Krug E, ed. Injury: a leading cause of global burden of disease. Geneva: WHO, 1999. [www.who.int/violence-injury-prevention/index.html](http://www.who.int/violence-injury-prevention/index.html).
2. Central Police Station Road Traffic Accidents (2000-2002) Kampala, Uganda Police Records
3. Injury Control Injury Surveillance Reports (2000 – 2003) Injury Control Centre, Kampala
4. Naddumba E.K. A Cross-sectional retrospective study of Bodaboda injuries at Mulago Hospital in Kampala – Uganda. *East and Centr Afr J of Surg* 2004;9(1):44-8
5. Otieno E.S: Prevalence, etiology and types of long bone fractures in children 18yrs and below as seen at Mulago Hospital, Unpublished Dissertation Makerere University 2001
6. Lule J, Pattern of tibial shaft fractures and early complications as seen at Mulago Hospital complex –Unpublished Dissertation Makerere University 2000
7. Galukande M, Jombwe J, Fualal J, Gakwaya A. Bodaboda injuries a health problem and a burden of disease in Uganda: a Tertiary Hospital Survey. *East and Centr Afr J of Surg* 2009;14(2):33-7
8. Twagirayezu E., Teteli R., Bonane A., Rugwizangoga E. Road Traffic Injuries at Kigali University Central Teaching Hospital, Rwanda. *East and Centr Afr J of Surg* 2008;13(1):73-6
9. Guo Lei et al. Study of injuries combining computer simulation in motorcycle–car collision accidents. *Forensic Science International*. 2008;177: 90–6
10. Toro K., Hubay M., So'tonyi P., Keller E. Fatal traffic injuries among pedestrians, bicyclists and motor vehicle occupants. *Foren Sci. Int.* 2005; 151: 151–6
11. Ojuka D. Skills upgrading for newly qualified surgeon: Is the district hospital in Kenya suitable? *The Ann of Afr Surg* 2008 3:10-14.