

ABSTRACT

A community based cross sectional survey was conducted in the district of Kandy to determine the incidence of road traffic injuries during the preceding one year, prevalence of disability following road traffic injuries any time in life, proportion of under-reporting of RTIs and the cost borne by the households due to road traffic injuries during the preceding one year period (2007).

In the community survey the sample was selected using the stratified multistage cluster sampling technique. 77 clusters comprising 40 households in each were selected according to the population proportion to size in the PHM areas. Individuals from the selected households were screened for history of any road traffic injury events using an interviewer administered structured questionnaire. Individuals who reported any RTI or death due to RTC 12 months prior to date of data collection and any individual having a disability following a RTI anytime in life were included in the study. Sample size calculation was done based on the World Health Organization (WHO) guidelines for conducting community-based surveys on injuries and violence (WHO, 2004). Accordingly, the sample size was 3080 households.

Component two of the study was a hospital based prospective study of inward patients being admitted following a RTC to the Teaching Hospital of Peradeniya (THP) and General Hospital Kandy (GHK), following a RTC, over a period of three months commencing from the 1st of December 2008. The study included all the road users injured from a RTC and admitted to the GHK and the THP during the study period.

The ethical clearance was obtained from the Ethical Review Committee, Faculty of Medicine, University of Peradeniya, and from the Ethical Review Committee, General Hospital Kandy for the hospital based component of the study. Informed verbal consent was obtained from each respondent prior to the commencement of the interview.

Results: Information on 11,724 persons in 3,080 households was obtained in the community based study. It was revealed that 149 RTI victims were identified giving an annual incidence rate of 12.7 per 1000 population (96% CI, 12.4-12.9), with an annual incidence of RTD 1.4 per 1000 population (96% CI, 1.3-1.5), with a fatal index of 10.7%. The under reporting of the RTIs was found to be 56.4%, and the estimation of annual incidence of RTI projected to the general population of Kandy district was 4.9 times higher than what was recorded in official statistics. Among the fatal injuries 12.5% were not reported in the official statistics. The middle and lower socioeconomic groups were the most affected by RTIs and the male to female ratio was 3:1. The victims those were in paid employment at the time of crash were 56.4%, and among them, 32.6% of them were daily paid workers. Pedestrians (34.2%) and passengers (26.8%) were the most affected road users. Motorcycles and three wheelers were the commonest type of vehicles involved in all types of crashes whereas the vehicle to pedestrian was the commonest type of crash reported (36.9%). Pedestrians being the most vulnerable 19.1% of them were hit while on the pedestrian crossing. Nearly quarter of the (24.0%) of the motorcyclists did not use a helmet, the majority (82.4%) of the vehicle occupants were not wearing a seat belt at the time of crash. The majority 103 (69.1%) of the injured had taken their initial treatment at government hospitals. The majority had minor injuries, whereas 43.6% had grievous to fatal injuries. It was revealed that 50.0% of the deaths had occurred immediately following the crash, of which the majority were males (81.1%) and in the productive age group (81.2%). Nearly one fifth of the victims (18.6%) happen to change their occupational position to a lower position, another (12.8%) had lost their jobs following RTC. Fifty nine (39.6%) of the households of the RTI victims had experienced a loss of income following RTC. Loss of working days was significantly high for the daily paid workers (87.9%) than those who were on monthly pay (43.1%) $p < 0.001$. For over half (58.4%) some other person has accompanied the victim for injury care to the hospitals. Twelve of 19 (63.2%) of those who cared for the injured had loss of pay due to loss of working days. The mean household spending for healthcare due to RTI was Rs. 11,693.63, which ranged from Rs.100.00 to Rs. 185,000.00. Mean total out of pocket spending for vehicle damage, repair of other damaged structures, for paying

compensation, for increase in the insurance premium, and other expenses was Rs. 48,266.39, which ranged from Rs.750.00 to Rs. 699,000.00. The majority of the RTI victims (85.9%) did not have any social insurance coverage. Only 20.1% received some form of compensation. The average amount taken as a loan was Rs.32, 920.00, which ranged from Rs.2500.00 to Rs. 400,000.00.

Out of 25, 14 were still paying their loans with interest. The average amount they received from selling their belongings was Rs.28,055.56, which ranged from Rs. 7,500.00 to Rs. 75,000.00. The average overall household expenditure for the RTI was Rs.34,244.38, which ranged from Rs. 100.00 to Rs. 700,000.00. The highest mean cost was borne by the households of rural areas. Fifty seven (12.7%) of all RTI victims were disabled, with a prevalence of 4.8 per 1000 populaion (95% CI, 4.7 -4.9) with 14.0% of them were having class IV (moderate disability).

Hospital based prospective study recorded 683 RTI inpatients from GHK and in THP during the study period. Annual incidence rate of RTI from both hospitals was 70.3 per 1000 surgical casualties per year. Annual incidence of RTD among all admitted RTI patients from GHK and THP was 7.3 per 1000 RTI admissions per year. Based on GHK police post Accident Register the fatality index was 10.0% during the study period. 71.3% of the recorded RTIs had occurred within the Kandy district. The annual estimated expenditure by the state for the RTI inpatients in GH Kandy and TH Peradeniya was Rs.171, 034,719.20.

Motorcyclists including the pillion riders 220 (32.3%), and the passengers of the motorized three wheel and four wheel vehicles 179 (26.2%) were the most affected road users among RTI inpatients. Majority of the motorcyclists (80.6%) were in the 20 to 49 year age group. Four hundred and forty eight of those in the age group of 20 to 49 years were the most affected age groups. However, 58 (8.5%) children and 79 (11.6%) of those

who were ≥ 60 years old were also injured by RTCs. The males were affected three times more than the females ($p < 0.001$).

Out of all injured persons 406 (59.4%) were in paid employment at the time of the crash. Twenty two (29.7%) of the injured were professional drivers, out of whom 14 were three wheel drivers. Vehicle to vehicle crash was the commonest type of crash and it was 209 (30.6%) whereas motorcycles, three wheelers, vans, and lorries were the commonest type of vehicles to be involved in RTCs.

Among the motorcyclists including the pillion riders 37 (16.8%) were not wearing a helmet at the time of the crash, and 98.5% of the vehicle occupants who were injured were not wearing a seat belt at the time of the crash. Twenty three drivers (9.3%) of all vehicles did not possess a driving license at the time of the crash. Among the RTI inpatients 14.1% were under the influence of alcohol at the time of the crash. Six hundred and eighty three RTI cases were admitted to both GH Kandy (GHK) 552 (80.8%) and TH Peradeniya (THP) 131 (19.2%) during the study period. The difference in the number of patients admitted to the two hospitals during the same study period was due to hospitals' admission policy where surgical casualty cases are admitted to THP only one day a week. The mean hospital stay for the victims was 7.8 days \pm 12.7 days. Mean stay in ICU was 10.1 days in GHK and 9.7 days in THP. All injuries sustained by RTI victims showed that injury to lower limbs were the commonest 579 (84.8%) among the 683 RTI inpatients in both hospitals. Of the fractures lower limb fractures were the commonest 186 (27.2%). However, there were 60 (8.8%) with head injury with fracture of the skull bones and another 123 (18.0%) had been admitted with loss of consciousness and admitted for head injury observation. Overall there were 469 (68.7%) of all types of head injuries that had been admitted during the study period. By using the abbreviated injury scale the injury severity, over half 430 (62.9%) of the RTI inpatients had moderate to severe injuries. Based on ISS severity score, most of the RTI inpatients 246 (36.0%) had an ISS score of 9 to 39. Twenty injured road users had an ISS score of ≥ 40 , with the

mean ISS score of 7.8 ± 10.5 . Those having the ISS severity score of > 15 were 65 (9.5%). Per patient day cost of all cost centers was high in THP in comparison with GHK. This may be due to the lower number of cases in THP compared to that in GHK. Per hour operation theater (OT) cost was Rs.52, 962.80 in GHK, and in THP this cost was Rs. 16,499.96. The majority of the RTI inpatients had shared all categories of services, still the cost of surgery was incurred by 368 of the injured and the surgical mean costs (Rs. 64740.65) was the highest cost of all costs. The expenditure to the state for 683 RTI inpatients admitted to GHK and THP during the study period was Rs. 42,758,679.80. ICU, Plastic surgery, Neuro surgical, and Orthopaedic surgery wards were the wards which had the highest mean cost of Rs. 326,870.09, Rs.218,762.32, Rs. 194,033.51, and Rs. 107,535.04 respectively. The significant high mean cost difference $p=0.008$ seen in the surgical wards at TH Peradeniya compared to GH Kandy was clearly due to the low utility with less number of patients admitted there. The major cost was incurred by those in the category of ISS >15 than those with ISS < 15 (minor). This difference was statistically significant $p<0.001$. Absence of an injury surveillance system is a draw back in identifying injury is a huge burden on the hospital care as a total.

Conclusion and recommendation:

RTI is a major public health problem causing an enormous economic impact to the household as well as the state. Under reporting of RTIs in the official data, non availability of injury surveillance system in the major hospitals leads to poor utilization of available resources and low prioritization of trauma care in the district. These finding of the study could be used as a baseline data for prevention of RTIs, and in planning of policy decisions for the “decade of road safety” in Sri Lanka.