Alcohol and Drug Use among Fatally Injured Pedestrians Involved in Motor Vehicle Accidents

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Abstract

Background
Knowing the fact that a pedestrian under the influence of alcohol could increase the chance of being hit by a motor vehicle, recently, the attention has been given not only to drink-and-drive but also drink-and-walk.

Aims
This paper will highlight and give emphasize on drink-and-walk, instead of drink-and-drive. Therefore, finding and discussion will tailor toward alcohol use among fatally injured pedestrian. The specific aim of this paper is to highlight the problem and pattern of alcohol use among fatally injured pedestrian in the city of Kuala Lumpur, Malaysia.

Methods
A retrospective data collection was conducted covering all fatal road traffic injury cases for the period of 2006 to 2009. The data on alcohol use was retrieved from the medical post mortem files obtained from the Hospital Kuala Lumpur’s Department of Forensic Medicine.

Results
A total of 670 fatally injured road traffic injury cases were identified. Of these, 505 cases were eligible for substance use analysis where pedestrian accounted for 10.9% (55 cases). The study revealed that 20.0% of the fatal pedestrians were positive for alcohol, 5.5% positive for drug and 5.5% were positive for both drug and alcohol. Male were predominant (88.2%) as compare to female. Higher percentage of substance use was noticed among brought-in-dead cases (41.0%) compared to dead-in-department cases (6.25%). By time of day, more death associated with positive alcohol occurred during night time.

Discussion and conclusions
This study highlights an alarming problem of drink-and-walk in the city area of Kuala Lumpur. There is a need to expand the study to other cities in Malaysia in order to know the extent of the problem. This study also highlights the need to emphasize on the issues of drink-and-walk and prevention activities should also address this vulnerable group of road users.

Introduction
Driving under the influence of alcohol is one of the well-documented risk factors for road traffic accident (WHO, 2004). As it is proven to increase the risk of road accident injuries and fatalities, many efforts as well as interventions were set up in order to deter drivers from drinking driving. Recently, the attention has been given not only to drink-and-drive but also to drink-and-ride and drink-and-walk. This is very important especially in the ASEAN region.
as most people travel by motorcycle and by walking especially in the city areas where most of the needed facilities or zones for safe crossing or walking are rarely available.

In South East Asia, about 50% of the region’s road traffic deaths are among vulnerable road users. Specifically, 33% of deaths are among motorized two or three wheelers followed by 12% pedestrians, and 4% cyclists (WHO, 2013). Meanwhile, Malaysian police statistic indicates that 1,859 pedestrians were involved in road traffic casualties in 2011, which death accounted for 28.5% and severely injured 22.5%.

Intoxication among pedestrians has long been identified as a risk factor in pedestrian crashes (Haddon et al. 1961, Honkanen et al. 1976; Struik and Rogerson 1988; Oksana TH 1995). The prevalence of alcohol use among injured pedestrians is well documented. Öström and Eriksson (2001) revealed that blood alcohol was detected in 19% of autopsied pedestrian fatalities (286 victims) in northern Sweden from 1977 to 1995, with a median concentration of 1.6 g/l. Meanwhile, National Highway Traffic Safety Administration reported that in 2009, 35% of all United State fatally injured pedestrians had BACs above 0.08 g/dL (NHTSA, 2010).

Despite the fact that pedestrians are vulnerable to be hit by a motor vehicle, most countries especially in ASEAN region including Malaysia do not have data to reflect the real problem of alcohol use among fatal or seriously injured pedestrians. This was the first study that tried to discover the problem of alcohol use among fatally injured drivers and pedestrian involved in road traffic crashes in Malaysia. However, the aim of this paper is to highlight the problem and the pattern of alcohol use among fatally injured pedestrian in the city of Kuala Lumpur.

**Methodology**

*Design and study population*

This was a retrospective study, which included all road traffic deaths admitted to the Hospital Kuala Lumpur’s Department of Forensic Medicine from 2006 to 2009. The protocol of the study was approved by MIROS’s Research Committee and Research and Ethic Committee, National Institute of Health, Ministry of Health Malaysia. The study’s findings represented the problem in the area of Kuala Lumpur.

*Data sources*

Data for this study was mainly retrieved from the medical post-mortem files which include (toxicology reports) obtained from the Department of Forensic Medicine, Hospital Kuala Lumpur consists of post-mortem report number, police report number, personal identification number, age, gender, ethnic group, time of crash, date of crash, type of crash, type of road user, type of vehicle, type of case, type of substance use, concentration of substance use, and injury details.

Based on personal identification and police report number, the records from the post-mortem files were matched with the police-based accident data. Information on time of crash, date of crash, type of crash, type of road user, type of vehicle were cross-checked with the police-based data. With regard to crash information, the police-based accident data will be used if there was any discrepancy among the sources of data. The results of alcohol or drug use were also crosschecked with the police-based data.
Since the study was retrospective in nature, all data obtained were from secondary data source. With regard to toxicology sample, preservation material used and procedures of sample transportation and data analysis were not intervened in this study. However, for the purpose of the report, it is explained in this paragraph. All samples were sent for toxicology analysis according to the standard procedure practiced by the Department of Forensic Medicine. According to the Department of Forensic Medicine, since 2006 they have been using free of alcohol preservative sample bottles that contained Natrium Flouride (NaF) as its preservative. The specimen security seal from the Forensic Medicine Department, Hospital Kuala Lumpur were affixed before the samples were sent to an accredited laboratory at the Department of Chemistry Malaysia.

Results

A total of 710 fatal road traffic deaths were registered at the department for the period of 2006 to 2009. Out of these, 670 (94.4%) were eligible for data collection as their post-mortem reports have been completed and not classified as “sensitive cases”. Out of 670 cases, 505 cases had toxicology results attached and eligible for substance use analysis. Of those 505 cases, 55 cases (10.9%) involved pedestrians referring to fatal pedestrian cases eligible for substance use analysis.

Incidences of Substance Use among Fatal Pedestrian

The study revealed that of those 55 cases involving fatally injured pedestrian, 17 (30.9%) cases were either positive for alcohol or drug or both. Breakdown by specific substance, 20.0% were positive for alcohol, 5.5% positive for drug and 5.5% were positive for both drug and alcohol. Distribution of the substance use cases by gender indicates that 88.2% involved men with the highest prevalence among age group of 50 to 59 (33.3%) followed by age group of 30 to 39 (26.7%) years old. Higher percentage of substance use was noticed among brought-in-dead cases (41.0%) compared to dead-in-department cases (6.25%).

Incidences of Substance Use among Fatal Drivers and Pedestrian by Age

In general, this study also revealed that the percentage of alcohol-positive only among all drivers (driver, riders, and cyclist) was 23.3%, 11.0% positive for drug and 2.3% positive for both drug and alcohol. The highest substance use was reported among pedestrian in the range of age between 50 to 59 years old (29.4%) followed by age group of 20–29 (23.5%) and 30–39 (23.5%). In contrast, the age group 30-39 show the highest percentage among driver, motorcyclist and cyclist with 43.3% (CI 95%; 33.1–53.5) followed by (20–29) and (40–49) with 39.7% (CI 95%; 32.4–47.0) and 41.2% (CI 95%; 25.1–57.3) cases respectively. The comparison can be seen in Figure 1 below.

Distribution of Fatal Drivers and Pedestrian with Positive Substance Use by Day and Time of Accident

Figure 2 shows the distribution of cases with substance use by type of road users and day. It was noted that the distribution of positive substance cases (the number of cases with positive substance use in a day divided by the total number of cases) among pedestrian is highest on Tuesday (3.8%) followed by Thursday (3.6%), Sunday (2.7%) and Saturday (2.7%). This distribution is in contrast with positive substance use cases among drivers, motorcyclist and
cyclist which is highest on Saturday (20.3%) followed by Sunday (17.5%) and Wednesday (16.1%).

The trend of accidents related to positive substance use by driver increase from 0000–0600 hours. The highest number of accidents related to positive substance use occurs between 0400–0559 hours with 42.0%, followed by 0000-0159 with 35.1%. After 0600 hours, the number of accidents related to positive substance use decreased and increased again after 1200 hours. In contrast to pedestrians, the number of accidents related to positive substance use increases after 1600 hours with highest prevalence occurring between 2000-2159 with 10.2%, followed by 2200-2359 with 5.0%. A clearer comparison is presented in Figure 3 below.

**Figure 1: Percentage of substance use by type of road users and by age**

**Figure 2: Distribution of cases with substance use by type of road users and day**

**Figure 3: Distribution of cases with substance use by type of road users and time**
Discussion

The study found that walking while under the influence of alcohol and drug among pedestrian involved in fatal crashes is alarming. The findings reveal that among fatally injured pedestrian about 20.0% were positive for alcohol, 5.5% positive for drug and 5.5% were positive for both drug and alcohol. Recently, in other high income countries, the attention has been given not only to drink-and-drive but also to drink-and-ride and drink-and-walk. Attention and thoughtful concern should be given by other countries especially in low-income and middle-income countries because of its great variety of traffic mix inclusive of vulnerable road users such as motorcyclist and pedestrians (WHO, 2004). In fact, vulnerable road users are at greater risk of crash involvement compared to other vehicle occupants.

Finding of this study also highlight the issues of under reporting in the police-based data especially for pedestrians as the police data is directly linked to the prosecution. Currently, drink-and-walk is not enforceable as there is no legal BAC limit for pedestrian. To have data, not to mention being a reliable data system especially for pedestrians hit by motor vehicles due to under the influence of alcohol and drug is the biggest challenge for most countries. It is fully understood that sufficient and reliable data, which lead to sound analysis, is critical to derive and drive an intervention. However, the fundamental issue is that does a country have enough data to support the policy and program implementation being for vulnerable road users, especially in developing and under developed countries? In Malaysia, on average 0.7% of drivers and riders involved in fatal accidents were related to under the influence of alcohol. No data for fatally injured pedestrians was reported. Based on this figure, none of the decision makers will spend scarce resources for preventing alcohol related crashes.

Another challenge in drink-and-walk issues is the limited support for legal action. Unlike, drivers and motorcyclist were subject to a legal blood alcohol limit, which prevents them from driving while under influence. For instance, in Malaysia, as mentioned in the Road Traffic Act which is applicable for all types of drivers, it is an offence to drive a vehicle with a BAC over the legal limit of 0.08 g/dl (RTA 1987). However the law is not applicable for pedestrian. As there is no specific regulation for intoxicated pedestrians, hence they could not be deter or controlled from walking or crossing roadways. Suggestion for introduction of a legal limit specifically for pedestrian should be given thorough consideration by policy makers depending on its necessity and suitability of implementation. Alternatively, other protection of pedestrians could be implemented through protective custody legislation. For example, as in South Australia, through the Public Intoxication Act, the police have the right to detain without arrest any intoxicated pedestrian for reasons of their own safety (Oksana, 1995). Besides, other possible countermeasures including public education or awareness should be distributed intensively to community. The public should be made aware and well understood on the risk of crash involvement when walking on or across a roadway while intoxicated. However, in Malaysia, to the author’s knowledge, there is no road safety education or awareness which focuses on the drink-and-walk ever been delivered to the public.

The current study has its limitation as the source of fatally injured pedestrian was only from the Department of Forensic Medicine of Kuala Lumpur Hospital, the findings of the study could only be generalized to the population of pedestrians in the city of Kuala Lumpur. Thus, further investigations and research is needed in order to gains better understanding of the extent of the drink-and-walk problem in this country.
Conclusion

This study shows an alarming result of alcohol and drug use among fatally injured vulnerable road users which include pedestrians and riders involved in motor vehicle accidents. This finding highlights the problem of drink-and-walk besides drink-and-drive. There is a need to expand the study to include more locations in order to know the magnitude of the problem. It is also a need to come out with a comprehensive review to address the gap so that BAC legal limits for specific vulnerable road users can be proposed to address drink-and-walk.

References


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