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Short communication

Characteristics of Motor Vehicle Accidents in the Herzegovina Region

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A B S T R A C T

Epidemiological studies around the world point to motor vehicle accidents as being one of the leading causes of death. The objective of our study was to analyze some characteristics of motor vehicle accidents in the region of Herzegovina. The study included 226 patients treated at the Clinic for Surgical Diseases and Urology of the University Clinical Hospital Mostar in 2005. A total of 78.3% or examinees were men and 21.7% women. The majority of patients of both sexes were aged between 20 and 30 years. Most of the accidents occurred during autumn and winter months, on weekends and in sunny-dry weather conditions. As expected, most of the hospitalized patients were injured either while driving an automobile or in a pedestrian versus automobile collisions. Of the 226 patients 92.5% admitted to the emergency department and 60.2% were hospitalized. Most of the injured (72.1%) were not under the influence of alcohol at time of the accident. 82.7% of injured were examined by medical personnel at the site within 30 minutes from injury but only 43.0% of them arrived at the hospital within 30 minutes of injury. As most of the injured patients were not under the influence of alcohol at the time of the injury we are of the opinion that more attention in preventing motor vehicle accidents should be directed to speeding and the state of the motorways and vehicles themselves. We propose a large-scale epidemiological study in the Herzegovina region and a review of current road management practices and emergency protocols.

Key words: *drivers, traffic accident, Bosnia and Herzegovina*

Introduction

Motor vehicle accidents are a major cause of death and injury worldwide. In 2005, the most recent year for which data are available, 45,520 deaths in the United States were related to motor vehicles[1]. Each year an estimated 127 000 people are killed and about 2.4 million injured in the 52 countries of the WHO European Region[2]. As data and epidemiological studies on this topic in Bosnia and Herzegovina are lacking the aim of our study was to show some characteristics of road traffic injuries in the region of Herzegovina.

Patients and Methods

University Clinical Hospital Mostar is the largest medical facility in Herzegovina. 226 patients treated for traffic related injuries at the Clinic for Surgical Diseases and Urology of the University clinical hospital Mostar in 2005 were included in this study. The patients come from seven municipalities of Herzegovina which the University Clinical Hospital Mostar covers and the traffic accidents occurred in the region of Herzegovina.

Statistics

Scale types of variables presented in research were nominal and ordinal, so they were analyzed with χ^2-test. Statistical significant difference was at $p<0.05$, and confidence interval (CI) higher than 95%. For statistical analysis of the obtained data we used software system SPSS for Windows (version 13.0, SPSS Inc, Chicago, Illinois, USA).

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Results

A total of 226 patients treated at the Clinic for Surgical diseases and Urology of University Clinical Hospital Mostar in 2005 were included in this study. Statistical analysis showed a significantly higher percentage of male patients (78.3%) in relation to female patients (21.7%) (χ^2=72.5; p<0,001; Figure 1).

The largest number of patients, both male and female, was aged 20-30 years (27.0%) (χ^2=3.3; p=0.776; Table 1). There was a larger number of male patients in all the age groups (χ^2=3.3; p=0.776; Table 2). A rise in motor vehicle accident injuries on weekends was evident as compared with other days. Friday was the day when most injuries occurred. (χ^2=47.4; p<0.001; Table 3).

The largest number of patients was injured during autumn and winter months (χ^2=74.7; p<0.001; Table 4) between 16:00 and 24:00 h. (χ^2=25.1, p<0.001; Figure 2). Sunny-dry weather conditions were the most frequent at time of the accidents (χ^2=87.5; p<0.001; Figure

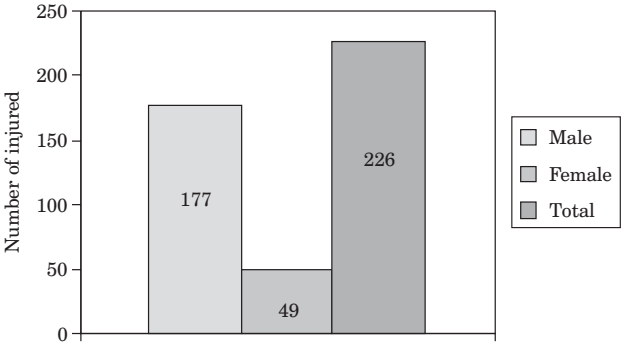

Fig. 1. The number of patients injured in motor vehicle accidents treated at the Clinic for surgical diseases and urology of University Clinical Hospital Mostar in 2005 by sex.

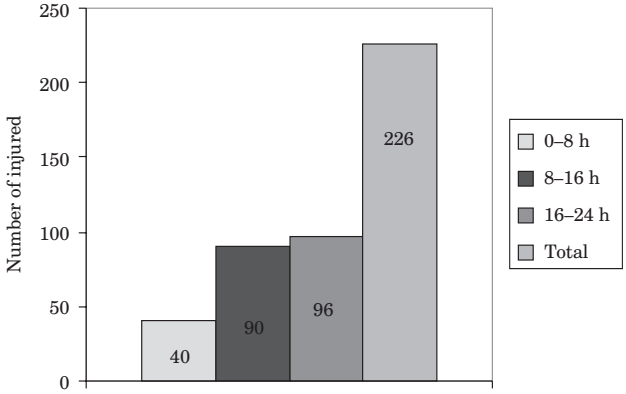

Fig. 2. Number of injured in motor vehicle accidents treated at the Clinic for Surgical Diseases and Urology of the University Chospital Hospital Mostar in 2005 by the time of injury.

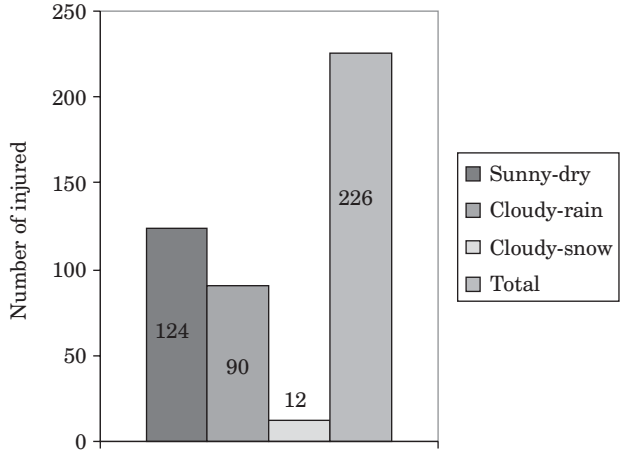

Fig. 3. Number of injured in motor vehicle accidents treated at the Clinic for Surgical Diseases and Urology of the University Chospital Hospital Mostar in 2005 by weather conditions.

TABLE 1
ANALYSIS OF INJURED IN MOTOR VEHICLE ACCIDENTS TREATED AT THE CLINIC FOR SURGICAL DISEASES AND UROLOGY OF UNIVERSITY CLINICAL HOSPITAL MOSTAR IN 2005 BY AGE GROUPS AND SEX

Age	10–20	20–30	30–40	40–50	50–60	60–70	70–80	Total
Male	16 (9.0%)	50 (28.2%)	18 (10.2%)	37 (20.9%)	20 (11.3%)	28 (15.8%)	8 (4.5%)	177 (100.0%)
Female	6 (12.2%)	11 (22.4%)	7 (14.3%)	8 (16.3%)	8 (16.3%)	8 (16.3%)	1 (2.0%)	49 (100.0%)
Total	22 (9.7%)	61 (27.0%)	25 (11.1%)	45 (19.9%)	28 (12.4%)	36 (15.9%)	9 (4.0%)	226 (100.0%)

χ^2=3.256; p=0.776

TABLE 2
ANALYSIS OF INJURED IN MOTOR VEHICLE ACCIDENTS TREATED AT THE CLINIC FOR SURGICAL DISEASES AND UROLOGY OF UNIVERSITY CLINICAL HOSPITAL MOSTAR IN 2005 BY SEX WITHIN THE AGE GROUPS

Age	10–20	20–30	30–40	40–50	50–60	60–70	70–80	Total
Male	16 (72.2%)	50 (82.0%)	18 (72.0%)	37 (82.2%)	20 (71.4%)	28 (77.8%)	8 (88.9%)	177 (78.3%)
Female	6 (27.3%)	11 (18.0%)	7 (28.0%)	8 (17.8%)	8 (28.6%)	8 (22.2%)	1 (11.1%)	49 (21.7%)
Total	22 (100.0%)	61 (100.0%)	25 (100.0%)	45 (100.%)	28 (100.0%)	36 (100.0%)	9 (100%)	226 (100.0%)

χ^2=3.256; p=0.776

TABLE 3
NUMBER OF INJURED IN MOTOR VEHICLE ACCIDENTS TREATED AT THE CLINIC FOR SURGICAL DISEASES AND UROLOGY OF UNIVERSITY CLINICAL HOSPITAL MOSTAR IN 2005 BY DAY OF INJURY

Days of the week	Number of injured
Monday	26 (11.5%)
Tuesday	15 (6.6%)
Wednesday	23 (10.2)
Thursday	22 (9.2%)
Friday	57 (25.2%)
Saturday	52 (23.0%)
Sunday	31 (13.7%)
Total	226 (100.0%)

χ^2=47.434; p<0.001

3). The majority of patients were injured while driving an automobile (χ^2=252.8; p<0.0001; Figure 4). Patients injured in automobile versus pedestrian accidents were more numerous then pedestrian versus other vehicles (χ^2=48.1; p<0.0001; Figure 5). A total of 92.5% of patients included in this study were referred to the emergency department (χ^2=161.4; p<0.0001) and were examined by medical personnel within 30 minutes from receiving the injury (χ^2=101.3; p<0.0001; Figure 6). Largest number of patients was treated at the hospital after the injury (χ^2=9.0; p=0.003; Figure 7). Majority patients were not under the influence of alcohol at time of the injury (χ^2=153.6; p<0.0001; Figure 8) Majority of patients were hospitalized within one hour of injury (χ^2=19.6; p=0.001; Figure 9).

TABLE 4
NUMBER OF INJURED IN MOTOR VEHICLE ACCIDENTS TREATED AT THE CLINIC FOR SURGICAL DISEASES AND UROLOGY OF UNIVERSITY CLINICAL HOSPITAL MOSTAR IN 2005 BY MONTH OF INJURY

Month of the year	Number of injured
January	23 (10.2%)
February	9 (4.0%)
March	18 (8.0%)
April	9 (4.0%)
May	11 (4.9%)
June	8 (3.5%)
July	10 (4.4%)
August	8 (3.5%)
September	26 (11.5%)
October	38 (16.8%)
November	34 (15.0%)
December	32 (14.2%)
Total	226 (100.0%)

χ^2=74,743; p<0.001

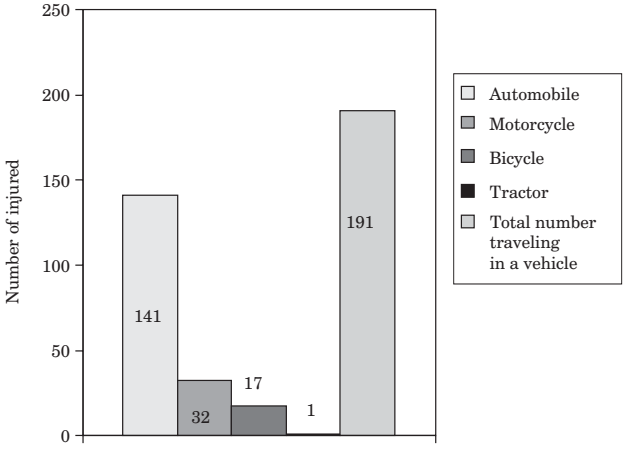

Fig. 4. Number of inured in motor vehicle accidents treated at the Clinic for Surgical Diseases and Urology of University Clinical Hospital Mostar in 2005 by type of vehicle they were traveling in.

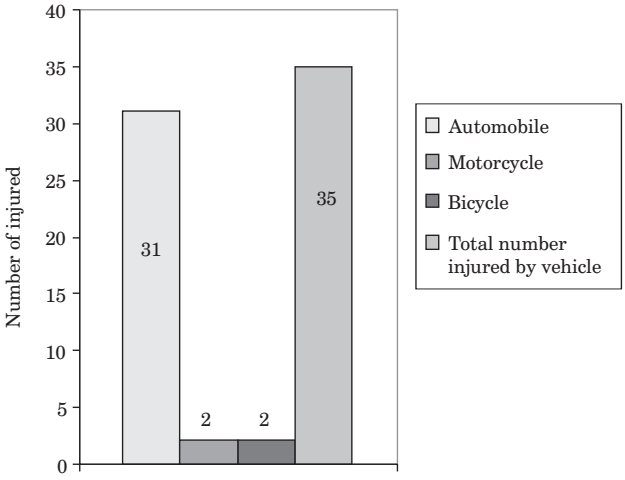

Fig. 5. Number of inured in motor vehicle accidents treated at the Clinic for Surgical Diseases and Urology of University Clinical Hospital Mostar in 2005 by type of vehicle versus pedestrian.

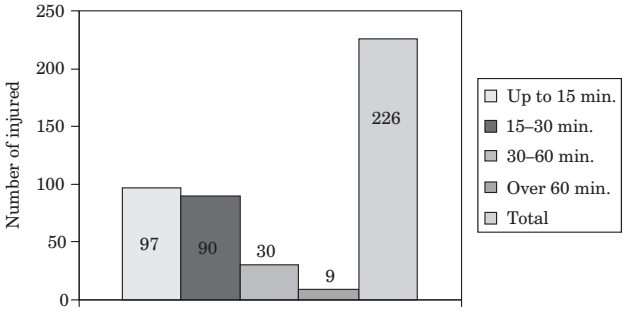

Fig. 6. Number of inured in motor vehicle accidents treated at the Clinic for Surgical Diseases and Urology of University Clinical Hospital Mostar in 2005 by the time of medical examination.

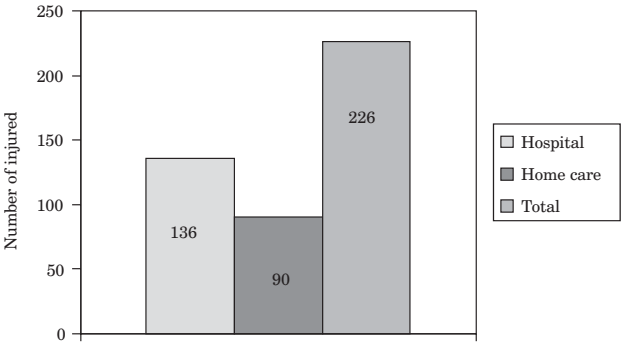

Fig. 7. Number of inured in motor vehicle accidents treated at the Clinic for Surgical Diseases and Urology of University Clinical Hospital Mostar in 2005 by the place of medical treatment.

Discussion and Conclusions

Our results showed a significantly higher percentage of male patients in relation to female patients in all the age groups. They also showed a higher number of young people (aged 20-30 years) among patients injured in traffic accidents. This is also the case in similar research conducted in southwestern Croatia or developing countries[3-4]. We propose that one of the possible reasons for this is that male drivers drive more aggressively and take more risks and are at higher risk for traffic accidents[5]. The majority of road traffic accidents included in this study occurred on weekends. This is consistent with similar studies[3-4]. This suggests the effect the traffic density has on traffic accidents. The rise in traffic accidents on weekends as compared to weekdays is probably also related to alcohol consumption. Higher occurrence of traffic accidents in autumn and winter months was expected due to worsening weather conditions. The high number of accidents during the day is also the result of traffic density and suggests a time period for increased watchfulness of police and emergency services. The high percentage of accidents in sunny-dry weather conditions seems surprising until we take in to account the high number of sunny days in the Herzegovina region in which the study was conducted. We think that also explains the relatively small number of accidents occurring during cloudy-snow weather conditions. As expected the largest number of injuries occurred either by driving an automobile or in a pedestrian *vs.* automobile collision. Most of the injured patients had not been recorded to be under the influence of alcohol. As this is consistent with the study conducted in southwestern Croatia[3] it suggests overemphasis of alcohol consumption in the public opinion as the main cause of traffic accidents. We think that speed, state of the roadways and vehicles themselves also plays a crucial role. This is also emphasized in The World Report on Road Traffic Injury Prevention[2]. While we found that 82.7% of patients included in the study were examined by medical personnel within 30 minutes of injury the time of arrival to hospital was less satisfying. Only 42.0% of patients arrived to the hospital within 30 min of injury. We think that improving on this time by better organization of emergency services and hospital admittance would significantly reduce mortality and disability. We propose a large scale epidemiological study and review of current road management practices and emergency protocols.

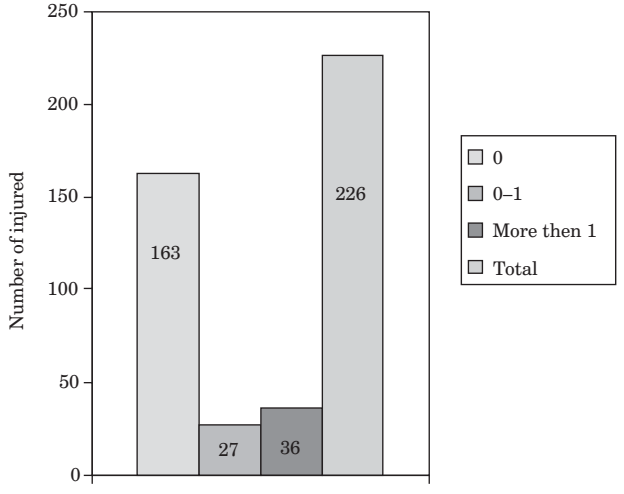

Fig. 8. Number of inured in motor vehicle accidents treated at the Clinic for Surgical Diseases and Urology of University Clinical Hospital Mostar in 2005 by the blood alcohol content.

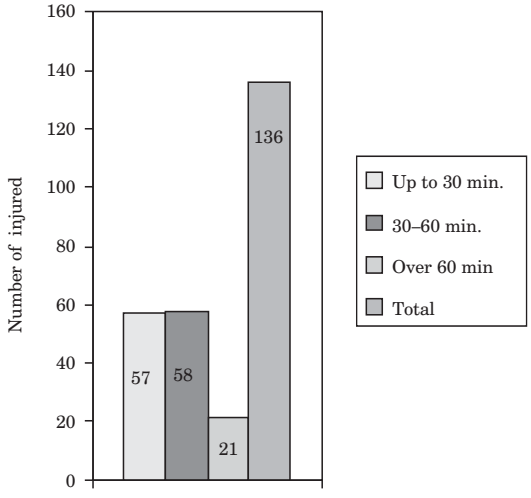

Fig. 9. Number of inured in motor vehicle accidents treated at the Clinic for Surgical Diseases and Urology of University Clinical Hospital Mostar in 2005 by the time of hospitalization.

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KARAKTERISTIKE PROMETNIH NEZODA U REGIJI HERCEGOVINE

SAŽETAK

Svjetska epidemiološka istraživanja pokazuju da su prometne nezgode među vodećim uzrocima smrti. Cilj naše studije bio je analizirati neke karakteristike prometnih nezgoda u regiji Hercegovine. U studiju je uključeno 226 bolesnika liječenih na Klinici za kirurške bolesti i urologiju Sveučilišne kliničke bolnice Mostar u 2005. godini. U odnosu na spol 78,3% su činili muškarci a 21,7% žene. Najveći dio bolesnika oba spola bio je između 20 i 30 godina. Većina nezgoda dogodila se tijekom jesenjih i zimskih mjeseci i vikendom te za sunčano-suhih vremenskih uvijeta. Očekivano, većina liječenih bolesnika je ozlijeđena vozeći automobil ili u pasivnom kontaktu sa automobilom kao pješak. Od 226 bolesnika njih 92,5% je upućeno u stanicu hitne pomoći a njih 60,2% je i hospitalizirano. Većina ozlijeđenih (72,1%) nije bila pod utjecajem alkohola u vrijeme ozlijede. 82,7% ozlijeđenih su pregledani na mjestu ozljede od strane medicinskog osoblja u roku od 30 min od ozlijede a samo 42,0% ozlijeđenih je stiglo u bolnicu u roku od 30 min od ozljede. Kako većina ozlijeđenih nije bila pod utjecajem alkohola u vrijeme nezgode smatramo da se veća pozornost u sprijećavanju nezgoda treba posvetiti neprilagođenoj brzini, kao i stanju prometnica i vozila. Predlažemo opsežnu epidemiološku studiju u regiji Hercegovine kao i temljeito preispitivanje sadašnjeg načina upravljanja prometnicama i sadašnje organizacije hitne pomoći na promatnicama.