Introduction

Road traffic injuries (RTIs) comprise a serious public health problem in the world and an estimated 1.24 million people are killed in road traffic injuries each year and as many as 50 million are injured [1, 2].

The increase in casualties among motorcyclists in recent years has turned into a very serious problem. Studying the hospitalized motorcycle injuries has indicated that serious damages have been prevalent, in so far as trauma and death have been reported 17.1% and 4.2%, respectively, and young motorcyclists have been seen to be more likely to die in comparison with those of older age [3]. Moreover, other reports determined injuries to head and neck, body, spine, and eyes among the motor vehicle injuries [4-6]. These injuries, which result from ignoring safety rules while riding motorcycles, impose a large financial burden on the society [1, 7].

Social, medical and economic problems caused by motorcycle injuries emphasize the importance of identifying the factors influencing such injuries. Behavioral factor is one of the significant approaches to identify risk factors of motorcycle injuries. Previous studies have indicated that the majority of motorcycle accidents involve young men inclined to pick unsafe attitudes and perilous behaviors such as riding over the speed limit, excessive speed, lack of safety equipment, etc. [7].

Abstract

Purpose: The aim of the present study was to compare personality characteristics in injured motorcyclists and uninjured motorcyclists.

Methods: This study as part of a larger case-control study was carried out on 130 motorcycle traumatic patients along with 91 control patients admitted to Shohada and Imam Reza university hospitals as the two referral specialty centers in East Azarbyjan Province of Iran in 2013. The Persian version of the motorcycle Riding behavior questionnaire (MRBQ) was used to assess riding behavior. Also, Millon Clinical Multiaxial Inventory-III was used to access personality disorders and psychiatric syndromes. Multivariate binary logistic regression was used as the main analysis method to estimate the adjusted odds ratios of subscales of Millon-III and risky behavior scales. The statistical analysis was conducted using Stata version 11 statistical software package.

Results: Mean/median scores of the personality subscales of schizoid, alienated, obsessive-compulsive, self-abusing, schizotypal, paranoid, post-traumatic stress, thought disorders, major depression, delusional disorder in the injured group were higher than in the control group (P<0.05). However, histrionic personality disorder was observed less in the injured group than the control group (P <0.01). According to the logistic regression models obsessive-compulsive and paranoid disorders were considered to be risk factors in motorcycle injuries.

Conclusion: According to the results of this study, obsessive-compulsive personality was a risk factor for motorcycle traffic injuries.

Keywords: Motorcycle traffic injuries, Case-control, Personality disorders, Risky riding behavior, Tabriz, Iran
and personality factors have been reported [14].
A particular dimension of mental trauma [16].
symptoms, and clinical symptoms. Each one refers to a personality disorders (as clinical patterns, severe injury, severe individual's future behaviors [15]. According to Millon’s theory of personality disorders, high-risk behaviors, aggressiveness, sensation seeking and drug abuse are important aspects of personality disorders (as clinical patterns, severe injury, severe symptoms, and clinical symptoms). Each one refers to a particular dimension of mental trauma [16].

One study in Montréal pointed to borderline and antisocial personality disorders in which impulsive-aggressive behaviors play a central role and substance use disorders appear to be risk factors for young male deaths in MVAs. Interestingly, this effect seems to be specific to MVA case subjects aged 26 years or over [17]. Also, studies on the impact of personality factors in traffic injuries have shown that the traits of anger and normlessness were effective predictors for aggressive violations. The traits of anger, sensation-seeking, normlessness, and altruism were effective predictors for ordinary violations. Moreover, altruism and normlessness were significant predictors for the total number of accidents [18, 19].

Although personality disorders were not the substance of much research as the risk factor of motorcycle injuries in previous studies, it can somehow be claimed that most studies which checked the behavioral aspects of such injuries investigated, in fact, only a small part of personality symptoms. Basically, the consideration of different aspects of personality disorders presents a comprehensive look at different behavioral aspects of dangerous people, while it also makes sense to sum up previous studies in this field which can be used in behavioral interventions. On the other hand, behavioral studies need research on different geographical situations so that the findings would not be influenced by cultural and social factors. However, few studies have been conducted on this subject in Iran. In this regard, the current study was carried out with an approach to personality characteristics in order to investigate whether there were any associations between the symptoms of personality characteristics and the risk of motorcycle injuries.

### Methods

This study, as part of a case-control research project, was carried out on 130 motorcycle traffic traumatic patients along with 91 control patients admitted to Shohada and Imam Reza university hospitals as the two referral specialty centers in East Azarbyjan Province of Iran. Tabriz is the center of East Azerbaijan Province. Data collection was carried out during 2013. The inclusion criteria were as follows;
- Being the rider of a motorcycle
- Being admitted to any of the two university hospitals
- Being injured due to a motorcycle traffic accident (for cases)
- Being admitted for a non-traumatic condition (for controls)
- Consent to participate in the study

The exclusion criteria included:
- Not having a known psychiatric disease except for adult ADHD and exposure of interest
- Very severe injuries preventing the conducting of interviews during the hospital stay
- Cognitive disorders because of their condition making the interview unreliable

A convenient sampling method was used to select the subjects. Samples were enrolled in an attempt to ensure the common source population and independence of exposure to selection principles in the selection of controls in case-control studies [20]. The controls were matched with the cases, by the age variable, through frequency matching technique. Considering the unavailability of adequate numbers of controls who fell in with the eligibility criteria, cases were enrolled in a twofold number of subsets. The variables assessed in this study included:

1. Demographic measures such as Age were measured as a numeric value, i.e., Marital Status; Educational level was scaled in four levels as: illiterate, primary school, high school and academic level.

2. Human related variables included: attention deficit hyperactivity disorder scale score; motorcycle riding behaviors score; the purpose of motorcycle riding (PMR) in two categories as riding motorcycle for fun (RMFF) and riding motorcycle for other purposes (RMFO); Helmet use measured in two scales (Yes, No); having motorcycle rider license.

The Persian version of the motorcycle riding behavior questionnaire (MRBQ) was used to assess risky behaviors of the motorcycle riders. It is a valid and reliable questionnaire with 48 items each having a five-item Likert scaled answer. It has been translated into Persian and validated by Motevallian et al [21]. Millon Clinical Multiaxial Inventory-III (MCMI-III) questionnaire was used to access personality characteristics and psychiatric syndromes. It has been translated into Persian and validated by Sharifi et al [16]. This questionnaire has 175 items, each with two (Yes, No) scaled answers; it also has 24 clinical scales classified in four categories:

A) The eleven personality clinical scales: Schizoid, Avoidant, Depressive, Dependent, Histrionic, Narcissistic, Antisocial, Sadistic, Compulsive, Negativistic, Masochistic; B) Three severe personality pathology scales: Schizotypal, Borderline, Paranoid; C) seven Clinical Syndrome Scales: Anxiety, Somatoform, Bipolar, dysthymia, Alcohol Dependence, Drug Dependence, Posttraumatic Stress Disorder; D) Three Severe Clinical Syndrome scales: Thought Disorder, Major Depression, and Delusional Disorder. The study used the mean of raw values for each subscale in MCMI-III.
Data analysis

Descriptive analysis and bivariate tests of association including independent t-test and Mann–Whitney–Wilcoxon test were used prior to the multivariate binary regression analysis as the main analysis method to estimate the adjusted odds ratios of the subscales of Millon-III and risky behavior scales. A P-value lower than 0.05 was indicative of statistical significance. Statistical analyses were carried out using Stata version 11 statistical software package.

The study was approved by the ethical committee of Tabriz University of Medical Sciences. Written informed consent was obtained from all study participants.

Results

A total of 221 subjects, all male motorcycle riders, were studied. The mean age of the participants in case and control groups were 27.67 (9.1) and 31.06 (8.54), respectively.

About 49% of cases, compared to 61% of controls, were married and only 12.3% of them had academic education compared to controls. Compared to controls, about two-thirds of cases didn’t have motorcycle riding license and 33.1% of injured riders never used helmets while riding (Table 1).

The results of independent t-test/Mann-Whitney U test (Table 2) indicated that the mean of scores of personalities of schizoid, alienated, obsessive-compulsive, self-abusing, schizotypal, paranoid, post-traumatic stress, thought disorders, major depression, and delusional disorder in the injured group were higher than in the control. However, histrionic personality disorder was observed to be less in the injured group than the control. Few multivariate binary regression models were applied. In the first model, the dominant role of personality characteristics was indicated in the occurrence of motorcycle accidents in which obsessive-compulsive disorder had a predicting role.

In the second model, the score of risky riding behavior was as effective as confrontation in a way that risky riding behaviors accompanied by personality characteristics reacted even as a preventive factor; however, obsessive-compulsive disorder and Paranoid were the risk indicators in determining motorcycle accident likelihood.

Discussion

The current study indicated that the intensity of personality characteristics such as schizoid, alienation, obsession-compulsion, self-abuse, schizotypal, paranoia, post-traumatic stress, thought disorders, severe depression, and delusional disorders are different from socially normal samples. Therefore, the hypothesis suggesting that personality disorders may form an important factor in impaired behavioral tendencies to ride motorcycles was somehow confirmed. In this regard, previous studies emphasized behavioral anomalies in the injured motorcyclists and reported different problems such as excitement seeking [22], drug abuse [23], impulsivity, decreased self-control, sense of guilt [24], and depression among the injured riders. Other studies reported that aggression, traditionalism, alienation, violation-aggression, and impulsivity were related to risky behaviors of riding and traffic accidents [25, 26]. Moreover, one study in Iran showed that anxiety, anger, sensation and excitement, altruism, and anomaly were risky behavioral factors in riding motorcycles [8].

This study also found that the riding behavioral scale has a preventive role while obsessive-compulsive and paranoid disorders were considered as potential determinants of motorcycle injuries. The previous studies emphasized the role of risky riding behaviors in road traffic injuries [27, 28].

Obsessive-compulsive disorder and paranoid are the predictors of motorcycle injuries. This finding is inconsistent with previous studies which reported borderline personality disorders, antisocial and aggressive impulsive behaviors to be the risk factors of personality disorders for motorcycle injuries [17]. It appears that idealism in achieving the highest excitement such as riding at the highest speed and displaying unique stunt moves, as motorcyclists do in streets, can be explained by this personality disorder. The previous study conducted in Iran also emphasized the emotional factor in motorcycle accidents [29].

On the other hand, obsessive-compulsive and paranoid disorders can be evaluated as the outcome of motorcycle traffic injuries, in so far as previous studies indicated obsessive-compulsive symptoms as shown in brain injuries [30].

Table 1. The distribution of demographic variables between case and control groups.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Subgroups</th>
<th>N (%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control</td>
<td>Case</td>
<td></td>
</tr>
<tr>
<td>Marriage</td>
<td>Single</td>
<td>35(38.9)</td>
<td>66(51.2)</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>55(61.1)</td>
<td>63(48.8)</td>
</tr>
<tr>
<td>Education level</td>
<td>Illiterate</td>
<td>4(4.5)</td>
<td>3(2.3)</td>
</tr>
<tr>
<td></td>
<td>Primary school</td>
<td>22(24.7)</td>
<td>54(41.5)</td>
</tr>
<tr>
<td></td>
<td>High school</td>
<td>40(44.9)</td>
<td>57(43.8)</td>
</tr>
<tr>
<td></td>
<td>Academic education</td>
<td>23(25.8)</td>
<td>16(12.3)</td>
</tr>
<tr>
<td>Purpose of motor riding</td>
<td>Fun</td>
<td>32(72.7)</td>
<td>96(73.8)</td>
</tr>
<tr>
<td></td>
<td>Non-Fun</td>
<td>12(27.3)</td>
<td>34(26.2)</td>
</tr>
<tr>
<td>Motorcycle riding license</td>
<td>Yes</td>
<td>26(28.9)</td>
<td>29(22.3)</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>64(71.1)</td>
<td>101(77.7)</td>
</tr>
<tr>
<td></td>
<td>Rarely</td>
<td>16(18)</td>
<td>3(2.3)</td>
</tr>
<tr>
<td></td>
<td>Sometimes</td>
<td>17(19.1)</td>
<td>34(26.2)</td>
</tr>
<tr>
<td></td>
<td>Often</td>
<td>17(19.1)</td>
<td>14(10.8)</td>
</tr>
<tr>
<td></td>
<td>Always</td>
<td>12(13.5)</td>
<td>36(27.7)</td>
</tr>
</tbody>
</table>

Although previous studies reported that 17.3% of the injuries took drugs and almost one fourth of them drank alcoholic beverages [4], drugs and alcohol were evaluated as an important risk factor in the occurrence of traffic injuries. They are related to the non-compliance with traffic rules such as not fastening the seat belt, high speed, mental confusion while driving and accidents as a result. However, the result of the current study did not indicate any relationships between the problems of taking drugs or drinking alcohol with motorcycle injuries [9, 31]. This finding can be interpreted in several ways. Basically, cultural problems in the accurate self-statement of taking drugs and drinking alcohol in Iran are one among the most important
barriers to information collection in different studies. Therefore, conducting more studies and clinical experiments can increase the accuracy of research findings.

Generally, from the findings of this study, it can be concluded that according to Millon’s theory, personality disorder is hierarchical and comprised of different levels (life, family, social and cultural). Therefore, many personality disorder symptoms in the injured motorcyclists can be considered to be caused by maladaptive performance of individuals in controlling failure. Therefore, mental interventions can be effective as appropriate treatment methods to control the symptoms of personality disorders among motorcyclists and decrease subsequent injuries as a result.

Conclusion

According to the research findings, screening results of obsessive-compulsive and paranoid disorders were found to be risk factors in motorcycle injuries. The results of this study can be used to treat the behavioral problems of the injured. On the other hand, the symptoms of behavioral problems in motorcyclists can indicate the risk in the future. This indicates the importance of managing them with respect to identification and mental interventions.

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References