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Risk perception and impulsivity: Association with risky behaviors and substance abuse disorders

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Abstract

Low risk perception and high impulsivity, in conjunction with substance abuse disorders, are associated with the occurrence of injury in the general population. The study described in this article investigated the association of risk perception and impulsivity with risky behaviors (infrequent seat belt use, drinking and driving, riding with a drunk driver, binge drinking, and speeding for the thrill) among adults with unintentional blunt trauma. Patients ($N = 756$) were assessed for substance abuse disorders and participation in risky behaviors. Risk perception and impulsivity were measured by questionnaire. Pearson's chi-square statistic was used to investigate risk perception, impulsivity, substance abuse, and possible confounders relative to risky behaviors. Odds ratios were calculated using logistic regression methodology. Univariate results indicated that low risk perception and high impulsivity were significant risk factors for risky behaviors. After adjustment for confounding factors, low risk perception and high impulsivity remained significantly associated with risky behaviors in the trauma patient population.

Keywords: Risk perception; Impulsivity; Risky behaviors; Alcohol; Traumatic injury

1. Introduction

Some trauma patients repeatedly engage in risk-taking behaviors despite the potential negative consequences. Particular personality traits have been linked to these behaviors. Risk-taking dispositions (i.e., degree of risk perception and impulsivity) have been linked to substance abuse disorders, risky behaviors (i.e., binge drinking, drinking and driving, riding with a drunk driver, and low seatbelt usage), and injury, in both the general population (Cherpitel, 1993, 1999) and in a case-control study comparing trauma patients and general surgery patients (Field and O'Keefe, 2004).

Cherpitel (1999) reported an association of impulsivity (but not risk perception) with injury in a general population sample ($N = 4925$). In her analysis, impulsivity remained associated with injury even after adjustment by demographics, "quantity and frequency" of alcohol use, drug use, and frequency of drunkenness. She concluded that "risk-taking dispositions may be more important predictors of injury than either drinking or drug use variables."

Field and O'Keefe (2004) compared the prevalence of risk-taking dispositions, risk-taking behaviors, and substance abuse disorders between a group of injured patients (cases) and general surgery patients (controls). They found an association between risk-taking dispositions and injury; however, this association disappeared when confounders (age, substance abuse, and driving-related and violence-related risk behaviors) were entered into the model.

Among many other factors, impulsivity and low risk perception modulate the occurrence of risky behavior (Beirness, 1993; Jonah, 1986). Other risk factors for injury affect both impulsivity and risk perception in a different fashion (i.e., substance intoxication, age, gender, and personality trait). Even though many impulsive individuals tend to have a low perception of risk, these characteristics are independent (Cook and Bellis, 2001). Therefore, some impulsive individuals may assess risk properly and other individuals with low risk perception may not be impulsive by nature.

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Substance abuse has been associated with injury, risky behaviors, impulsivity, and low risk perception (Field and O'Keefe, 2004). Furthermore, impulsivity and low risk perception, together with hereditary and environmental influences, have been linked to the development of substance abuse disorders during adolescence (Krueger et al., 2002; Young et al., 2000; Kendler et al., 2003; Finn et al., 2000; Sher et al., 1991; Chassin et al., 2004).

In this study, we investigated the relationship between risk perception, impulsivity, substance use, and "risky behaviors" (binge drinking, drinking and driving, riding with a drunk driver, speeding for the thrill, and driving without using a seatbelt) in a population of unintentionally injured blunt trauma patients. We hypothesized that impulsiveness and the perception of risk, when adjusted for specific demographic, socioeconomic, and substance use factors, are important predictors of the risky behaviors in which many trauma center patients have participated.

2. Methods

2.1. Study site/population

The study was conducted at the R Adams Cowley Shock Trauma Center at the University of Maryland Medical Center in Baltimore. The center is a regional adult Level I trauma center that serves the most populated counties of central Maryland. The center also serves the urban communities surrounding the medical center. Approximately 85% of patients treated at the trauma center are admitted from the scene of injury. Those injured in rural/suburban settings are usually transported by Medevac helicopters, and those injured in the city are transported by ambulance. In terms of mechanism of injury, age, and sex, our patient profile is similar to the aggregate of patients treated in trauma centers throughout the United States (Champion et al., 1990). For patients admitted from the injury scene, time from injury to admission averages about 1 h.

For this study, we identified patients with unintentional blunt trauma (vehicular, pedestrians, and falls) among the 1118 trauma center patients interviewed. The interviewed population is representative of the entire trauma population at our trauma center (Soderstrom et al., 1997a).

2.2. Eligibility criteria

Patients were eligible for recruitment if they were 18 years of age or older, were admitted from the scene of injury, had intact cognition, and had a length of stay of 2 or more days. A length of stay of 2 or more days was chosen to identify patients with serious injuries. Patients were not eligible for interview while in intensive care units. Patients initially in intensive care units or who were cognitively impaired were followed until they became eligible or were discharged. Finally, a patient was not eligible for study if his or her attending surgeon thought that a patient interview would have a negative impact on the clinical course. The study design was approved by both the Institutional Review Board of the University of Maryland School of Medicine and the Center's Research Committee.

2.3. Patient interviews

Eligible subjects were approached for study consent by the trained interviewers. Patients were considered cognitively competent if they had good memory of recent and remote events. The interviewers had no knowledge of admission blood alcohol concentrations (BAC) or other drug test results. Demographic data (age, gender, race, and marital status), injury history, socioeconomic status (education, income, and unemployment), risky behaviors, and risk-taking dispositions were collected during the interview.

Risky behaviors were explored with questions that evaluate the frequency or likelihood of the patient (1) using a seatbelt, (2) drinking and driving, (3) riding with a drunk driver, (4) binge drinking, and (5) speeding for the thrill. Similar questions were used by other investigators and in the behavioral risk factor surveillance system (Cherpitel, 1993, 1999; Field and O'Keefe, 2004; Hunt et al., 1992; Soderstrom et al., 2001a). "Low seatbelt use" was defined as less often than "nearly always." "Drinking and driving" and "riding with a drunk driver" were defined as the self-reported occurrence of the event during the previous 30 days. "Speeding for the thrill" was considered positive when individuals reported that the behavior occurs more often than rarely.

Risk-taking dispositions (risk perception and impulsivity) were evaluated using questions from the National Alcohol Survey of 1990 (Cherpitel, 1993, 1999). Risk perception was ascertained from responses to six hypothetical items (e.g., "Drove over the speed limit," "Drove without a seatbelt," "Drove while drunk"), with the answers graded from 1 (very unlikely) to 5 (very likely) to estimate whether something bad might happen to them if they had behaved in that manner. The impulsivity evaluation included responses to five statements (e.g., "You might say I act impulsively," "I often act on the spur of the moment without stopping to think"), with the answers graded from 1 (not at all) to 4 (quite a lot) to indicate whether the statement described them. The actual format of the questions has been published elsewhere (Cherpitel, 1993, 1999; Field and O'Keefe, 2004; Soderstrom et al., 2001a). Responses to risk perception and impulsivity items were summed for each patient and classified as high or low with respect to the median scores (i.e., median split) in the population studied.

Alcohol disorders were diagnosed by using the Psychoactive Substance Use Disorders section of the Structured Clinical Interview for the DSM-III-R (SCID) (Spitzer et al., 1987). The SCID is a widely accepted instrument that provides in-depth alcohol and other drug use diagnoses according to standardized criteria (Kitchens, 1994; NIAAA, 1991).

2.4. Admission data

Injury type (vehicular crashes, falls, etc.) and injury severity score (ISS) were obtained from the trauma registry. Admission BACs were obtained from the Shock Trauma Center's toxicology database, which is housed and maintained at the National Study Center for Trauma and Emergency Medical Systems at the University of Maryland at Baltimore (Soderstrom et al., 1997a,