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Psychological distress and physical disability in patients sustaining severe injuries in road traffic crashes: Results from a one-year cohort study from three European countries

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ABSTRACT

The current study aimed to follow-up a group of road crash survivors for one year and assesses the impact of injury on their psychological and physical condition. All crash survivors that were admitted to the intensive or sub-intensive care units of selected hospitals in Greece, Germany and Italy over one year period (2013–2014), were invited to participate in the study and were interviewed at three different time-points as follows: (a) at one month (baseline data), (b) at six months, and (c) at twelve months. The study used widely recommended classifications for injury severity (AIS, MAIS) and standardized health outcome measures such as the Disability Assessment Schedule II (WHODAS 2.0) to measure disability, "Impact of Event Scale" (IES-R) to measure Post-Traumatic Stress Disorder (PTSD), Center for Epidemiological Studies Depression Scale (CES-D Scale) to measure depression. A total of 120 patients were enrolled in the study in all the partner countries and 93 completed all follow up questionnaires. The risk of physical disability was 4.57 times higher [CI 1.98–2.27] at the first follow up and 3.43 times higher [CI 1.43–9.42] at the second follow up as compared with the time before the injury. There was a 79% and an 88% lower risk of depression at the first and the second follow up respectively, as compared with the baseline time. There was also a 72% lower risk of Post-Traumatic Stress at the second follow up as compared with the baseline time. A number of factors relevant to the individuals, the road crash and the injury, were shown to distinguish those at higher risk of long-lasting disability and psychological distress including age, marital status, type of road user, severity and type of the injury, past emotional reaction to distress. The study highlights the importance of a comprehensive and holistic understanding of the impact of injury on an individual and further underlines the importance of screening and treating psychological comorbidities in injury in a timely manner.

Introduction

A large number of road users involved in road traffic crashes recover from their injuries, but some of them never fully recover [1]. Literature shows many of them to experience some kind of permanent disability and deficits in self-reported health [1–7] as well as psychological problems including depression and Post-traumatic Stress Disorder (PTSD) [8–10]. Road traffic injuries have also been shown to place a heavy burden on households [11]. Particularly in low- and middle income countries, many families

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are driven deeper into poverty by the loss of a breadwinner, or by the expenses of prolonged medical care, or the added burden of caring for a family member who is disabled from a road traffic injury [12,13]. The economic costs also strike hard at a national level, imposing a significant burden on health, insurance and legal systems, which exceeds 5% of the GDP in low- and middle-income countries and has been estimated at approximately 2% of the GDP in EU countries [14].

Although the European Commission and the UN General Assembly have adopted Resolutions (64/255) [15] and taken action towards improving elements of post-impact care with the aim to address this growing epidemic, the attention paid by health policymakers, by the medical community and by the road safety field to trauma-related care and research has been disproportionately small so far [16–18].

In light of the aforementioned circumstances, the attention has been refocused on the plight of victims of road crashes while action has been urged in conducting more national studies on road crashes as well as in addressing the problems of under-reporting and misclassification of injuries through improvements in injury recording at hospitals and other medical institutions [19].

The current study is part of a collaborative project, which was funded by the European Commission DG Mobility and Transport (MOVE/C4/SUB/2011-294/SI2.628846/REHABIL-AID) and sought to explore the physical, psychosocial, emotional and financial sequel of the injuries sustained in road traffic crashes, one year after the crash. The REHABIL-AID project was expected to guide European policy on the complex needs of injured patients and develop an integrated and holistic response to patients' needs. Most importantly, the project was expected to produce uniform European protocols for data collection in European countries as well as increase the chances of building European estimates on the effectiveness of safety functions.

Among the objectives of the current study were to follow-up a group of road crash survivors for one year and assess the impact of injury on their psychological and physical condition, using widely recommended classifications and standardized health outcome measures. The study comes to fill a big gap in the literature, as there are very few studies examining the specific outcomes of road injury in Europe from the victims' perspective, especially for this hard-to-reach multi-trauma patient population. Although the majority of severely injured survivors recover, investigation of their profile and identification of variables that contribute to the development of post-trauma psychopathology and disability is important from a treatment perspective to reduce the burden on individual and community resources. Such empirical information is highly warranted from Europe as current evidence seems to have derived from studies with serious methodological limitations [20]. Most importantly, as the majority of empirical studies from Europe investigate the consequences of road traffic crashes immediately after the crash, this study comes to shed light to the long-term needs of the survivors during a neglected post-injury period. It further comes to produce up-to-date evidence in an area with scarce research data from the European region [4], despite the wealth of research from other geographical regions [21–23].

The current empirical work involves a carefully selected mixture of countries in southern and Western Europe, where the prevalence of injuries is above the EU average and the costs for national health budgets are very high such as in Italy and Germany [18].

Methods

Research strategy

A total of seven public hospitals were conveniently selected and involved in all the study sites; five in Greece (Region of Crete), one in Italy (Pavia) and one in Germany (Hannover). Both the intensive and the sub-intensive care units were involved in the study. Sub-intensive care refers to the second-level care, which represents the site of the most complete response to in-hospital emergency/urgency in a given territory. Second-level care includes a trauma centre, a functional aggregation of various operative units that, on the basis of established protocols, is able to deliver the quickest and most suitable treatment to patients with major injuries.

The study participants were enrolled during a 12-month period starting from April 2013. Eligibility for participation in the study was based on the following list of inclusion criteria: (a) injury of different levels of severity (based on MAIS score) and different location (based on the body region e.g. head, thorax, lower extremities) sustained at road traffic crashes (RTC) independently of the type of vehicle, (b) hospitalization $\geq$1 day in the intensive or sub-intensive care unit of the selected hospitals, (c) age $\geq$18 years, and (d) sufficient ability to communicate and understand the research questionnaires. Patients aged $<$18 years and those in coma status or death during the enrollment period were excluded from the study. Patients who accepted the invitation to participate in the study were monitored for one year after the date of admission to the intensive or sub-intensive care unit and were interviewed at three different time-points as follows: (a) at one month (baseline data), (b) at six months (1st follow up), and (c) at twelve months (2nd follow up). In addition to the self-reported information, all the eligible participants provided information drawn from their medical records.

Procedures

One or two interviewers were recruited in each study site with the task of collecting the baseline and follow up data from all the new patients. Selected health care professionals (medical doctors and nurses) were appointed in each collaborating hospital upon the consent of the hospital administration to assist the principal investigators in conducting the study. More particularly, the nurses were assigned with the task of regularly controlling for new patient admissions that fulfilled the inclusion criteria of the study and notifying the principal researchers as well as the appointed interviewers in each study site. They were also in charge of establishing the first contact with the patients and their carers and introducing the interviewer to them upon their approval. The medical doctors were assigned with the task of assisting the interviewers with recording injury-related and other medical information from patients' records. The interviewers recruited in the three study sites (Greece, Italy, Germany) received training at two different time points; the first training session had a total duration of 6 h and was delivered by the principal investigators at the beginning of the baseline data collection. The second training session had a total duration of 5 h and was delivered at the beginning of the first follow up. A manual was also developed for the training of the interviewers aiming to guide them during the data collection phase. The manual contained brief explanations of each item as well as instructions on the interview procedures and the questionnaire administration.

Data collection

All patients that were admitted in the intensive or sub-intensive care units of the selected hospitals within the 12-month enrollment period (2013–2014) and met the inclusion criteria were invited to participate in the study. Written consent was requested by all the eligible patients prior to participation in the study upon receiving information about the study objectives and procedures. All patients were informed that the completion of the questionnaire was optional, all information provided would be