13 IMPUTATION OF CHRONIC NECK PAIN TO A MOTOR-VEHICLE COLLISION: A BAYESIAN APPROACH

doi:10.1136/injuryprev-2012-040590t.13

[1]LR Salmi, [2]JD Cassidy, [3]LW Holm. *[1]University of Bordeaux, ISPED, Centre INSERM U897-Epidemiologie-Biostatistique, F-33000 Bordeaux, France; [2]Faculty of Health, University of Southern Denmark; [3]Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden*

Background Causes of chronic neck pain include motor-vehicle collisions. Imputation of an individual pain to a past motor-vehicle collision, however, remains difficult.

Aims/Objectives/Purpose A Bayesian method is proposed to assess causality of chronic neck pain in individuals.

Methods In epidemiology, causality assessment deals with four types of persons defined by exposure (history of collision) and occurrence of chronic neck pain. We linked the epidemiological approach to imputation, which considers persons with both history of motor-vehicle collision and chronic neck pain. Based on methods developed in pharmaco-epidemiology, imputation was formulated using Bayes theorem, relating epidemiological knowledge on causes, a patient's history, and the posterior odds that the chronic pain was caused by the collision. Data needed to apply the method include cause-specific relative risks, and frequencies of history of collisions, and of a positive relevant characteristic in persons with no history of collision. Illustrations are proposed using published data and hypothetical cases.

Results/Outcomes Identified relevant characteristics include mechanism and qualification of the collision, social-psychological variables, occupation and working conditions, age and gender. Cases illustrate that the approach allows switching from major uncertainty to ruling in or out a causal relationship with the collision; full application of the method will require more epidemiological data.

Significance/Contribution to the Field The nature of relevant characteristics underscores the need to fully document the mechanism of all injuries in emergency rooms. As in other applications, the bayesian approach to imputation could become a powerful tool for experts involved in litigation of chronic neck pain or other motor-vehicle related injuries.