G24 Bicyclist Fatalities in New York City

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After attending this presentation, attendees will understand the epidemiology, risk factors, and types of injuries in bicycling fatalities observed in the New York City area.

This presentation will impact the forensic science community by promoting understanding about fatal bicycling injury patterns and the risk factors for these fatalities in a large metropolitan area.

According to the Department of Transportation, New York City has over 250 miles of designated bicycle lanes and over half a million residents use a bicycle at least several times a month. Bicyclists share the roadway with motorists including buses and trucks. The medical examiner case files were reviewed on all bicycling fatalities in New York City to study the autopsy findings, toxicological results, and the epidemiological patterns of these fatalities in a large metropolitan area.

The New York City Office of Chief Medical Examiner electronic death certificate database was searched for all fatalities involving a bicycle that occurred between April 2006 and August 2012. There were a total of 156 fatalities (ten were excluded from the study: five pedestrians struck by a bicycle; one adult rode a child's tricycle; one fell onto a bicycle; and three accidents occurred outside New York City). The following data were collected: age; sex and ethnicity of the bicyclist; reason for cycling and helmet use; survival interval; New York City borough; time and place; environmental conditions; type of bicycle and motor vehicle; autopsy findings (injury locations and skeletal fracture sites); and, toxicological results.

Of the 146 bicyclists, there were 134 males and 12 females and the average age was 40 years (range 8-83 years of age). The ethnicities were White (n=48), Hispanic (n=43), Black (n=32), Asian (n=19), and unknown (n=4). Recreational use accounted for 40 fatalities and work commuting for one. There were 5 work-related deaths, and 100 were unspecified. A survival interval occurred in 72 bicyclists (from 2 hours to 33 years). Within the five boroughs of New York City, the fatalities were distributed as: Brooklyn=52; Manhattan=42; Queens=33; Bronx=19; and Staten Island=0. Among those that were known, the most frequent time when the fatalities occurred was between 6:00 p.m. and 7:00 p.m. (n=11) and 10:00 p.m. and 11:00 p.m. (n=11), with 62% (n=86) occurring between 1:00 p.m. and midnight. Most fatalities occurred on a Friday (n=28). The environmental conditions reported in 80 instances were: clear (n=55); raining (n=7); cloudy (n=6); cold (n=2); or hot (n=1). Most fatalities occurred during the summer months (n=62) with 24 of these occurring in the month of August. The lowest number of fatalities was recorded during winter months (n=19). The most frequent motor vehicle involved was a four-door sedan (n=34) or truck (n=18). The type of bike involved was recorded in only 11 instances (4 were mountain bikes). For helmet use, 15 decedents were wearing a bike helmet and 67 were not (64 cases did not document this information).

Postmortem examination included 116 autopsies and 30 external-only examinations. All causes of death were due to blunt trauma and all manners of death were accidents. The most commonly injured body region was the head (n=121) and 91% of fatalities who did not wear a helmet sustained a head injury. Other regions included: thorax (n=72); abdomen and pelvis (n=54); and upper/lower extremities (n=51). Vertebral injuries occurred in 37 instances (most commonly the cervical spine in isolation (n=17) of which 82% had an associated head injury). Fractures, detected in 132 fatalities, most commonly involved the skull (n=89) and/or ribs (n=64). Toxicological analysis detected ethanol (n=22) with an average blood concentration of 0.13gm%, cannabinoids (n=15), cocaine (n=11), and methadone (n=3).

Similar to fatalities in motor-vehicle-only collisions, bicyclists also die from blunt injuries, and drug/ethanol intoxication is not unusual. Although some case information may not be available in some deaths (especially if there is a prolonged survival interval), investigators need to concentrate on obtaining information on the use of bicycle helmets, reason for bicycling, and type of bike (e.g., wide handle bars, which may increase the likelihood of a collision). The overwhelming male predominance may be a reflection of a higher number of male bicyclists and/or related to increased risk taking among males. This information may be useful for public health considerations when looking for ways to prevent these deaths.

Fatality, Bicycling, Trauma

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