

Risk Factor Analysis Inability to Sleep and Whiplash: The Inevitable Correlation

By **Matthew J. DeGaetano, DC and Steve Baek, DC**
Certified in Personal Injury

A human's neck has a normal range of mobility. If it is forced beyond its capacity, the neck can either snap or the muscles in it could become strained. Whiplash is a condition that occurs when the patient's head or neck is violently jerked backward. Majority of whiplash injuries are caused by car crashes (rear-end collision), sports accidents, or any other sudden and forceful impact.

In reality, *whiplash* is more of a legal rather than a medical term. It is not a single injury but a collection of several soft tissue and muscle injuries that are affecting the neck and shoulder areas. As a car is rear-ended, the body of the passenger tends to fly forward and the head is left to hit the car seat. It is a patient's responsibility to call a doctor if any injury did occur after a vehicular accident, or in cases where the patient is unconscious, the companion during the accident should be the one to do this.

These are risk factors that can be used to consider an individual's risk for injury and for late whiplash. Although there is some overlap, these are not interchangeable. There is little doubt that other factors would also predispose a person to injury or complicate the patients recovery. However, if it has not been reported in such a way as to provide some degree of face validity, you will not see it here.

Risk Factor Analysis

There are essentially two ways to view risk. From a strict epidemiological standpoint, one is justified only in looking at those studies which have carefully controlled, stratified, and analyzed their findings. In prospective studies, a relative risk can then be calculated.

Some degree of bias might have been interjected. More often, the sample size was so low that the study did not have sufficient power to show significant relationships. In some studies, certain variables, such as age, may be so

homogenously distributed, that differences are difficult to detect. And in still other studies, the authors were looking at something other than risk.

However, since our real purpose is to understand all that we can about the risk for injury in these low speed rear impact crash (LOSRIC), it seems reasonable to allow for certain assumptions or conjectures which are supported by much circumstantial evidence and, usually, for which no conflicting evidence is reported. Accordingly, I caution the reader that many of the references listed beside the risk factors below should not be viewed necessarily as strict epidemiological studies, but rather as generally and reasonably supporting the variable as a risk factor. To this list of references, you can see from reading this book that one could add others mentioned earlier as well, although I did not attempt to confuse the issue by doing so. For example, several of the crash studies demonstrated that backset greatly increased head/neck kinematics and acceleration. Seat back and head restraint design have also been shown to be important. If we assume that an association exists between these factors and the potential for injury--which seems quite reasonable--then we could add these references to the list.

Under risk for injury, are the studies supporting the various factors. Few studies to date have been undertaken in regards to the risk for poor outcome (i.e., late whiplash), but I have listed a few. Obviously one is not entitled to conclude that no relationship exists, simply because it has not been investigated. Nor should a statement such as, "no statistically significant relationship was found," be taken to imply that no relationship exists, because if the study had insufficient power or suffered from certain design errors, it would be difficult to see real relationships. I have attempted to review the details of most of the important studies throughout this book, whenever they became relevant to the discussion.

Risk for late whiplash:

1. Female sex.
2. Rear vector impact vs. other vectors.
3. Body mass index in females only.
4. Immediate/early onset of symptoms (i.e., within 12 hours) and/or more severe initial symptoms.
5. Ligamentous instability.
6. Initial back pain.
7. Initial decreased cervical spine ROM (females only).
8. Initial upper back pain.
9. Initial upper extremity numbness or weakness or pain.
10. Greater subjective cognitive impairment.

11. Greater number of initial symptoms.
12. Greater severity or frequency of initial symptoms.
13. High initial pain intensity.
14. Use of seat belt shoulder harness*. For neck (not back) pain; non-use had a protective effect.
15. Initial physical findings of limited range of motion.
16. Neck pain on palpation.
17. Muscle pain.
18. Disturbed vision.
19. Initial sleep disturbance or fatigue.
20. Initial neurological symptoms; radiating pain into upper extremities.
21. Past history of neck pain or headache.
22. Headache.
23. Initial degenerative changes seen on radiographs.
24. Foraminal stenosis (cervical).
25. Loss or reversal of cervical lordosis.
26. Increasing age (i.e., middle age and beyond).
27. Front seat position; driver seat vs. passenger seat for females.
28. Rear seat position.
29. Occupants of vehicles manufactured in the late 1980s to early 1990s (OR=2.7 vs. those in early 1980s vehicles). This is relevant for rear impact crashes only. Other data suggest this relationship holds for all 1990s vehicles.
30. Initial generalized sensory hyperalgesia.
31. Head rotation at impact; both frontal and rear crashes.
32. Non-awareness of impending impact.

Some of the most common symptoms of long-term injury include severe neck pain, dizziness, cognitive difficulties, blurring of the patient's vision, abnormal sensations and inability to sleep. These symptoms could take a *few days up to a number of weeks to appear*, so it's not wise to conclude that everything is fine if the person doesn't complain of any aches or pains immediately. A person's health should always be deemed most important, therefore, right after the accident, it is advisable that the all car accident victims in the vehicle should undergo a thorough medical exam by a certified expert in personal injury.

Since whiplash injuries normally occur on the neck muscles and ligaments, the person who suffers from it might have difficulty in sleeping. Primarily, he or she has to bear with the pain in the area, and since the neck has to inevitably touch the pillow during sleep, this could further irritate or worsen the patient's injury.

The more serious car accidents could also end up with brain-damaged passengers. When this happens, it isn't only the person's behavior, motor and cognitive skills that are badly affected, it's also possible that the person will have difficulty in falling asleep.

Sleep Disturbance certainly patients with chronic pain complain that it interferes with their sleep. This lack of nightly respite intensifies the patient's suffering and leads to chronic fatigue. Thus, the pain eventually, either directly or indirectly, invades all levels of the patient's life, affecting home life, interpersonal relationships, and the ability to function on the job. Pain is demoralizing and, in some cases, ruinous. Chronic pain leads to depression as well.

There are two options for any whiplash victims – first, he or she can choose to mask the pain and take analgesic medicines or they can go to their doctor and discuss their condition with them. Anything that's not a part of any normal body function should immediately be addressed. If in the absence of pain a patient still complains that they can't sleep well, then they really have to go to a specialist to be evaluated and have it treated.

If you have any questions or if you would like more information, please contact Dr. John Doe at Johndoe@JonhdoeChiuro.com or 555-555-1212

References

Langfitt TW, Obrist WD, Alavi A, et al.: Computerized tomography, magnetic resonance imaging, and positron emission tomography in the study of brain trauma. J Neurosurg 64:760-767, 1986.

Michaud LJ, Rivara FP, Jaffe KM, et al.: Traumatic brain injury as a risk factor for behavioral disorders in children. Arch Phys Med Rehab 74:368-375, 1993.

Simpson DA, Blumbergs PC, McLean AJ, et al.: Head injuries and children: measures to reduce mortality and morbidity in road accidents. World J Surg 16:403-409, 1992.

Chaplin D, Deitz J, Jaffe KM: Motor performance in children after traumatic brain injury. Arch Phys Med Rehab 74:161-164, 1993.

Wilson B: Recovery and compensatory strategies in head injured memory impaired people several years after insult. *J Neurol Neurosurg Psychiat* 55:177-180, 1992.
Evans RW: The postconcussion syndrome and the sequelae of mild head injury. *Neurologic Clinics* 10(4):815-847, 1992.

Moldofsky H: Rheumatic pain modulation syndrome. The interrelationship between sleep, central nervous system serotonin, and pain. In Critchley M, Friedman M, Gorini S, et al. (eds): *Advances in Neurology*, vol 33. New York, Raven Press, 1982, pp51-57.

May KP, West SG, Baker MR, et al.: Sleep apnea in male patients with fibromyalgia syndrome. *Am J Med* 94(5):505-508, 1993.
<http://bone-muscle.health-cares.net/whiplash-causes.php>
<http://ezinearticles.com/?Whiplash-Injuries&id=4380599>