Whiplash: Fact or Fiction?
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FROM ABSTRACT:

Cervical sprain/strain or whiplash injuries are a common cause of acute and chronic musculoskeletal impairments and are ubiquitous after rear-end automobile collisions.

The diagnosis is largely subjective and the ideal treatment controversial.

Unfortunately, the majority of compensated litigation claims are associated with whiplash-type injuries secondary to motor vehicle accidents.

Fortunately, many recent advances have led to better understanding of the collision and injury biomechanics and to development of a prognostic classification system, objective diagnostic tests, an array of treatment modalities, and, most important, safer automobiles.

These advances will undoubtedly lead to decreased incidence, a more accurate diagnosis, and a tailored management regimen resulting in improved outcomes and ultimately fewer legal proceedings.

THESE AUTHORS ALSO NOTE:

Whiplash associated disorders (WADS) are caused by acceleration/deceleration injuries and are most often seen after rear-end motor vehicle accidents.

These injuries “present a significant risk for permanent disability.”

[IMPORTANT]

In 1995, 5.5 million Americans were injured in motor vehicle accidents.

“The majority of patients report resolution of their symptoms by 4 to 6 weeks, but up to one third may complain of chronic neck/arm symptoms.”

[Important, one-third of WAD patients have not recovered by 6 weeks].

Approximately 15 million Americans currently complain of chronic whiplash symptoms.
85% of all compensated litigation claims are associated with whiplash-type injuries from motor vehicle accidents, and insurance companies pay out $29 billion a year for claims associated with these accidents. [WOW!]

“The most common complaint after a whiplash-type injury is neck pain in the cervical and upper back region. Other symptoms include decreased range of motion, headaches, shoulder pain, dizziness, arm paresthesias, and visual and auditory disturbances.”

During a rear-end collision, the automobile and its occupant are forced forward while the occupant's head and neck are forced backward.

“Any rotation of the head or neck at the time of impact increases the forces imparted to the cervical facet joints and capsular structures, which are believed to be the source of neck pain.” [Very Important]

Visual and auditory disturbances may result from brain injury. [Important]

“Commonly, symptoms may be mild initially but may intensify within 48 to 72 hours.” [Very Important]

“Plain radiographs are usually normal except for loss of physiologic lordosis and/or anterior widening of the prevertebral soft-tissue space.”

“If a ligamentous injury of herniated nucleus pulposus is suspected, magnetic resonance imaging is performed.”

“If no significant injury is identified, delayed flexion/extension lateral plain radiographs are obtained to rule out occult instability.” [Important]

There is a myriad of biomechanical force vectors during a motor vehicle accident.

Higher speeds at impact result in increased force imparted to the passenger and increased head acceleration/deceleration.

“Rotation of the head (pretorque) and neck position at time of impact increases the force imparted to cervical anatomical structures, especially the cervical facet joints and capsular structures.” [Again, Very Important]

“Just before a rear-end collision, drivers often rotate the head to look into the rearview mirror.” This increases facet capsule strain leading to injury.

Headrests decrease injury by 10%.

Headrests should be at the level of the ear, the head's center of gravity.
The more reclined the seat is at the time of a rear-end collision, the larger the arc of motion of the head and neck is in the sagittal plane relative to the chest, which increases neck injury.

“Although wearing seat belts at time of impact has prevented countless life-threatening injuries, whiplash injuries have doubled since mandatory seat-belt laws were introduced.” [Very Important] The seat belt can act as a fulcrum increasing injury to the neck.

The biomechanics of a rear-end collision include the following:

1) Initially, there is a moment of flexion of the upper cervical spine (occiput-Cl-C2).
2) Then, within 0.2 second, the mid and lower cervical spine (C3-C7) hyperextends injuring anterior soft-tissue structures.
2A) The more superficial soft tissues like the sternocleidomastoid and strap muscles are initially disrupted, followed in sequence by the deeper structures-the prevertebral musculature, which includes the longus capitus, longus colli, and scalene (anterior, middle, posterior) muscles.
2B) Then, with a greater force, there is tissue disruption of the anterior longitudinal ligament, the anterior annular fibrosis of the intervertebral disc, and the bony facet joints and their capsules.

“The cervical zygapophysial joints are particularly vulnerable to injury during a flexion/extension event,” yet the injuries are not often seen radiographically.

“Zygapophysial joints fractures, intra-articular hemorrhage, and capsular ruptures have been found pathologically.”

“Many patients with chronic neck symptoms reported having the head rotated at time of impact (before the collision), and such rotation creates pretorque to the facet joints,” And increased facet capsular strain. [Again, Very Important]

The most accepted classification for whiplash is the Quebec Task Force on Whiplash-Associated Disorders:
Grade 0.
Patient has no subjective complaints and no objective signs.

Grade I.
Patient complains of neck pain only, but has no objective signs.

Grade IIA.
Patient complains of neck pain and has objective signs of point tenderness on palpation in the anterior and/or posterior aspect of the neck without any neurological findings.
Grade IIB.
Patient complains of neck pain and has objective signs of point tenderness and decreased cervical range of motion, without neurological findings. (This grade is the most common.)

Grade III.
Patient complains of neck pain and has objective signs of point tenderness, decreased cervical range of motion and any of the following: absent deep tendon reflexes, sensory deficit, and/or objective weakness on motor testing. [One of the reasons I like the Myologic Diagnostic System (www.myologic.com) is because it objectively documents reduction of range of motion and muscle weakness using the 5th edition of the AMA Impairment Guides, which appropriately places them in category Grade III, this requires more treatment and has a worse prognosis for complete recovery.]

Grade IV.
Patient complains of neck pain and has an associated fracture/dislocation.

“This classification system is beneficial mainly for prognosis in emergency department settings.” [This Comment Is Very Important]

“Patients with advanced degenerative changes at 2-year follow-up had poor outcomes.”

Whiplash injured patients have 3 times the incidence of neck and/or shoulder pain 7 years post-accident compared to a normal population.

84% of patients who sustained a second whiplash injury reported recurrence and/or worsening of previously resolved neck and arm symptomatology. “Of those patients reporting a recurrence, 97% were symptom-free before the second accident.”

“A large majority of drivers and passengers suffer acute and chronic symptoms related to whiplash-type injuries.”

“Many researchers believe that primary injuries to facet joint structures may be the source of chronic neck pain after whiplash injuries.”

“The facet joints are innervated with a tremendous amount of sensory end organs, including mechanoreceptors and nociceptors that transmit, respectively, joint proprioception and pain information.”

The atlanto-occipital joints, the atlantoaxial joints, and the C2 spinal nerve are the primary pain generators in cervicogenic headaches.

Post-whiplash headaches may arise from a traumatic arthropathy of the C2-C3 joint, which is innervated by the third occipital nerve.
Use of diagnostic zygapophysial joint blocks has shown that 54% to 60% of patients neck pain after whiplash injury arises from the facet joint.

When the chief complaint following whiplash injury is headache, it arises from the C2-C3 facet joint 50% to 53% of the time.

Corticosteroid injections into chronic pain facet joints does not result in lasting relief.

SUMMARY FROM AUTHORS:

"Whiplash injuries or WADs are true pathologic entities associated with significant morbidity." [This is important because it indicates that the complaints are not biosocial, they are organic].

"Often, patients with whiplash symptoms have no objective findings and negative radiographic studies." [Important]

"Although symptoms resolve spontaneously in most cases, one third of patients develop chronic complaints." [Important]

"Short-term immobilization followed by active physical therapy with a return to normal daily activities seems to be paramount for quicker resolution of symptoms."

Surgery is rarely indicated in treating WAD patients. Surgery is reserved for ligament instability, worsening cervical deformity with increasing neck pain, and worsening neurologic complaints.

KEY POINTS FROM DAN MURPHY

1) Rear-end motor vehicle whiplash injuries “present a significant risk for permanent disability.”

2) At least one third of rear-end motor vehicle whiplash injured patients do not resolve in six weeks and complain of chronic neck/arm symptoms.

3) About 15 million Americans currently have chronic whiplash symptoms.

4) 85% of all compensated litigation claims are associated with whiplash-type injuries from motor vehicle accidents, and insurance companies pay out $29 billion a year for claims associated with these accidents.

5) Visual and auditory disturbances after whiplash may result from brain injury.

6) It is common for whiplash symptoms to be mild initially but then intensify within 48 to 72 hours.
7) NOTE THESE FOUR QUOTES:

A)) “Any rotation of the head or neck at the time of impact increases the forces imparted to the cervical facet joints and capsular structures, which are believed to be the source of neck pain.”

B)) “Rotation of the head (pretorque) and neck position at time of impact increases the force imparted to cervical anatomical structures, especially the cervical facet joints and capsular structures.”

C)) “Just before a rear-end collision, drivers often rotate the head to look into the rearview mirror.” This increases facet capsule strain leading to injury.

D)) “Many patients with chronic neck symptoms reported having the head rotated at time of impact (before the collision), and such rotation creates pretorque to the facet joints,” and increased facet capsular strain.

8) X-rays after whiplash injury are usually normal except for loss of lordosis and/or anterior widening of the prevertebral soft-tissue space.

9) Whiplash can cause ligament injury or herniated nucleus pulposus.

10) Flexion/extension lateral x-rays are used to rule out instability.

11) Headrests decrease injury by 10%.

12) Whiplash injuries have doubled since mandatory seat-belt laws were introduced because seat belts act as a fulcrum increasing injury to the neck.

13) The cervical facet joints are particularly vulnerable to injury during a whiplash event, yet the injuries are rarely seen on x-rays.

14) Each of the Quebec Task Force grades on whiplash has a requirement for more treatment and a worse prognosis for recovery. The most important distinction between Grade II to Grade III is to objectively document extremity muscle weakness.

15) The Quebec Task Force grades on whiplash “is beneficial mainly for prognosis in emergency department settings.”

16) Cervical spine degenerative changes result in a poor prognosis for recovery.

17) Whiplash injured patients are 3 times more likely to suffer from chronic neck and/or shoulder pain 7 years after an accident than are normal controls.
18) 97% of patients who were injured in a whiplash accident and became pain free develop symptoms again when exposed to a second whiplash injury.

19) Facet joints are innervated with a tremendous amount of mechanoreceptors and nociceptors that transmit joint proprioception and pain information.

20) The atlanto-occipital joints, the atlantoaxial joints, and the C2-C3 joints are the primary pain generators of cervicogenic headaches.

21) Corticosteroid injections into the facet joints do not benefit chronic facet pain patients.

22) Whiplash injuries are true pathologic entities associated with significant morbidity, [which indicates that they are not biosocial, they are organic].

23) “Often, patients with whiplash symptoms have no objective findings and negative radiographic studies.”