

WHIPLASH INJURY – A MEDICOLEGAL ISSUE

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SUMMARY – Whiplash injury is the most common injury sustained in traffic accidents. On exposure to different forces, multiple neck injuries may occur. Following the injury, many patients suffer from subjective symptoms that may even persist upon completion of medical treatment. As a result, there are serious problems in the objective evaluation of permanent consequences of the injury. The study included 40 randomly selected whiplash injury victims without previous lesions of cervical spine, and 40 equally selected patients with previously confirmed cervical degenerative changes. They all suffered from permanent whiplash injuries and applied for reimbursement for nonmaterial damage to Zagreb Insurance Company during 2001. Sixty-seven per cent of patients underwent continuous treatment for 5-6 months, however, the sequels of whiplash injury persisted in the form of decreased motility of cervical spine, arm paresthesia, vasospasm of vertebral arteries and permanently narrowed visual field. Pathological findings were verified by objective diagnostic methods: functional x-rays of the cervical part of the spinal cord, electromyoneurographic examination of arms, transcranial Doppler sonography of vertebrobasilar arteries, visual field assessment by Goldman method, and clinical examination by medical censor. The treatment of injured patients with previous degenerative changes of cervical spine took a longer time, with a higher level of head and neck motility reduction. Ultimately, in terms of reimbursement, they were conceded a lesser degree of permanent physical damage than those without previous cervical spine lesions.

Key words: *Whiplash injuries – diagnosis; Whiplash injuries – physiopathology; Whiplash injuries – legislation and jurisprudence; Cervical vertebrae, injuries – pathology; Neck pain – diagnosis; Accidents, traffic – prevention and control*

Introduction

Over the past few years, a sudden increase in the number of patients suffering from whiplash injury has been recorded in all insurance companies¹⁻⁷. On the one hand, this increase could be explained by the increased number of insured persons for cases of car accidents, and also by the obligatory use of protective belts that decreased the mortality rate. On the other hand, it could also be the result of poor socioeconomic situation in our country⁵.

According to medical definition, whiplash injury is a hyperextensive-flexory-rotatory injury, most frequently occurring in traffic accidents when the victim's vehicle is hit from the back. At the time of the crash, the vehicle is forcefully pushed forward. During the first 100 msec, the body of the victim together with the seat is leaning forward, while the head and neck remain in the position. After 200 msec, the situation is reversed, the body is returning to its previous position while the head and neck move forward as far as physiologically possible. During the exposure to these forces, multiple neck injuries occur (lesions of the muscles, ligaments, fasciae, intervertebral discs, nerves, cartilages and joint surfaces and capsules)¹⁻¹⁰.

Recent results indicate that minimum speed of the impact resulting in whiplash injury is above 15 km/h.

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Immediate symptoms are extensive, including local neck ache, paresthesia, dizziness and headache. Afterwards, 24-48 hours following the injury, temporary vision disturbances and limb weakness may develop. After the treatment has been completed, many subjective symptoms including headache, dizziness and paresthesia of the arms persist in these patients. These symptoms cannot be objectified and usually result in serious problems during evaluation of permanent consequences of whiplash injuries¹¹⁻¹⁴.

Patients and Methods

The study included 40 randomly selected whiplash injury victims without previous lesions of cervical spine, and 40 equally selected patients with previously confirmed cervical degenerative changes. They all suffered from permanent whiplash injuries and applied for reimbursement for nonmaterial damage to Zagreb Insurance Company during 2001.

Data from the police accident reports about injured persons, time to first request for surgical examination, type of treatment and results of examinations and tests (including standard examinations like functional x-rays of the cervical part of the spinal cord (FSVK), electro-

myoneurographic examination (EMNG) of arms, transcranial Doppler sonography (TCD) of vertebralbasilar arteries, visual field examination according to Goldman), total time of treatment, and residual permanent outcomes with reference to the clinical report performed upon treatment completion were analyzed.

Results

Analysis revealed that police records provided no data on injured persons in 74 per cent of reimbursement requests. The investigation showed 82 per cent of injured patients to be in the 20-40 age group. They presented for initial examination within 48 hours of the accident, when the symptoms were most pronounced. They were on sickleave for 5-6 months (Figs. 1 and 2).

Grade I or II whiplash injury according to the Quebec Task Force (QTF) protocol was verified on initial surgeon's examination in 67 per cent of patients. These patients underwent continuous treatment for a period of 5-6 months, however, the sequels of whiplash injury persisted in the form of decreased cervical spine motility, arm paresthesia, vasospasm of vertebral arteries, and permanently visual field narrowing (Fig. 3). All pathologic findings were verified by objective diagnostic meth-

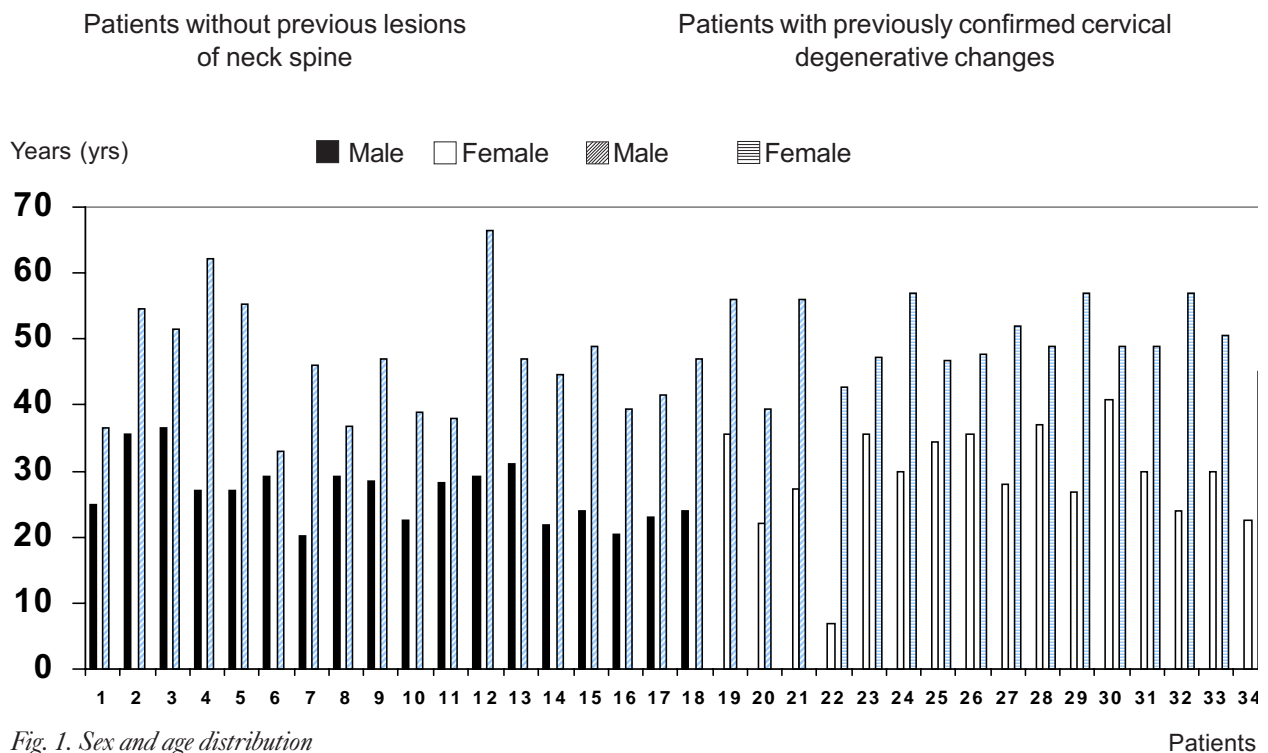


Fig. 1. Sex and age distribution

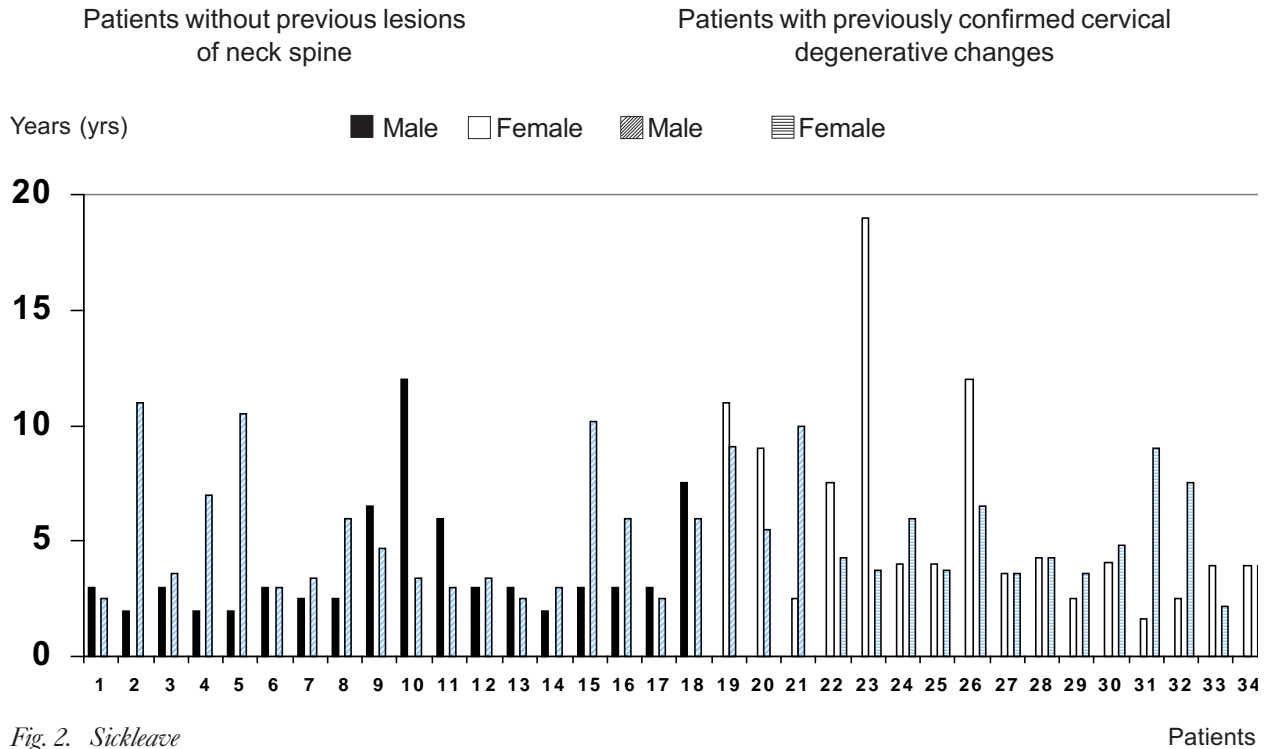


Fig. 2. Sickleave

ods including FSVK, EMNG of arms, TCD of vertebo-basilar arteries, visual field according to Goldman, and clinical examination by medical censor (Fig. 4).

Patients with previous degenerative changes of cervical spine were older (mean age 20.25 years) than patients without incipient degenerative changes of cervical spine, and their average treatment time was by 1 month longer (Figs. 1 and 2).

Results of functional radiography of cervical spine without previous incipient degenerative changes indicated the presence of instability as the result of sustained injuries of the ligaments. On the other hand, the majority of injured patients with previous incipient degenerative changes of cervical spine had only limited mobility as shown by functional radiography. Only a small number of patients reported instability or both (Fig. 5).

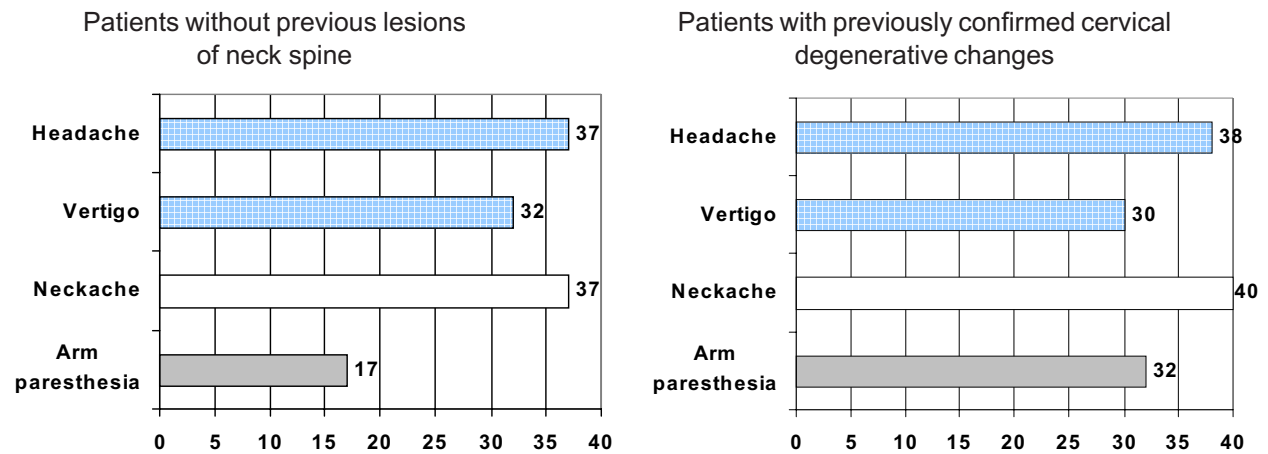


Fig. 3. Subjective symptoms after whiplash injury

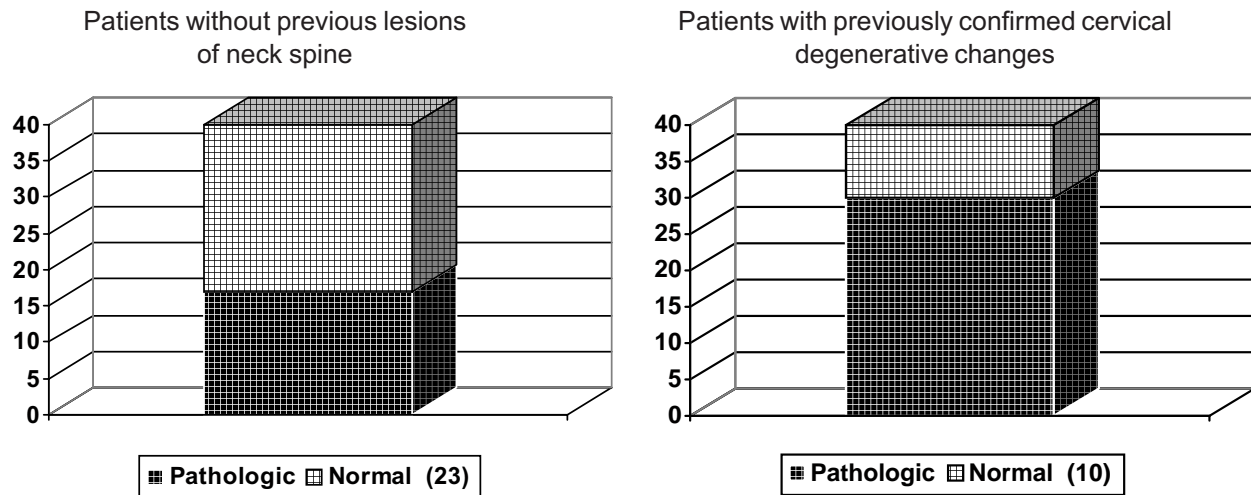


Fig. 4. Neurological status after whiplash injury

In both groups of patients, EMNG findings indicated unilateral or bilateral injury of cervical spine roots. In patients with previous incipient degenerative changes of cervical spine, bilateral injuries detected by EMNG were more frequent (Fig. 6).

Although the treatment of injured patients with previous degenerative changes of cervical spine lasted longer and their head and neck motility was reduced to a greater extent, in terms of reimbursement they were ultimately conceded a lesser degree of permanent physical damage than those without previous cervical spine lesions.

Conclusion

At present, whiplash injury is very common in traffic accidents and causes a major litigation problem worldwide. Different medical specialists are increasingly requested to give their opinion on patients who have sustained this injury. The main issue in the diagnostic, therapeutic, and medicolegal sense is to evaluate the indicating and objective evidence that the patient has suffered a genuine organic and/or psychological lesion, which has caused disability following whiplash injury¹⁵⁻¹⁹. Due to the increasing number of car accidents and

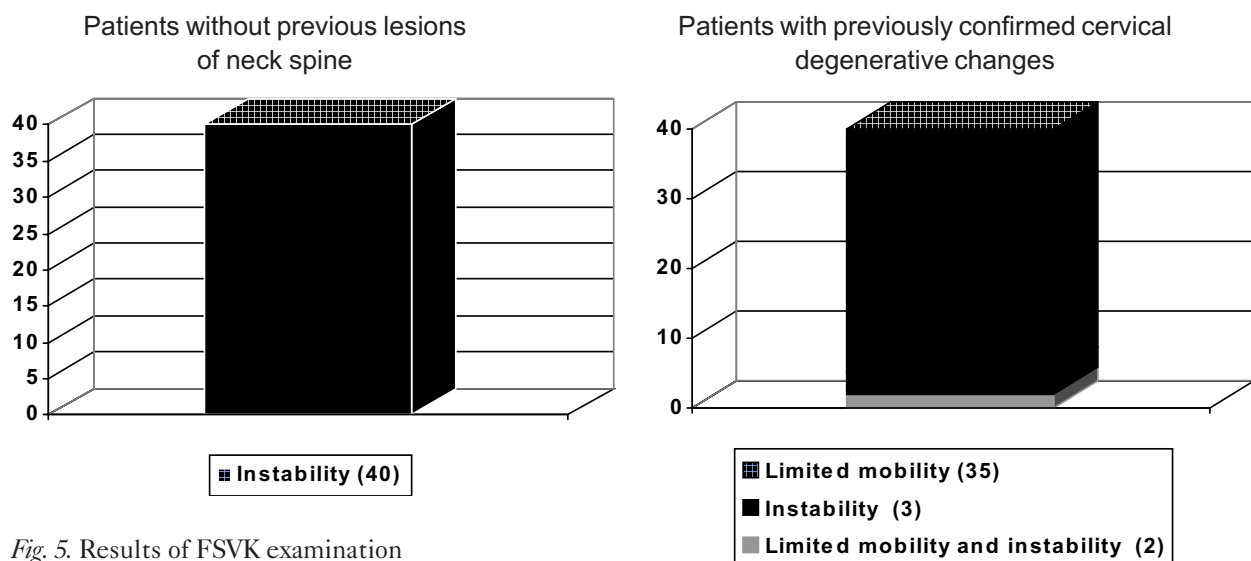


Fig. 5. Results of FSVK examination

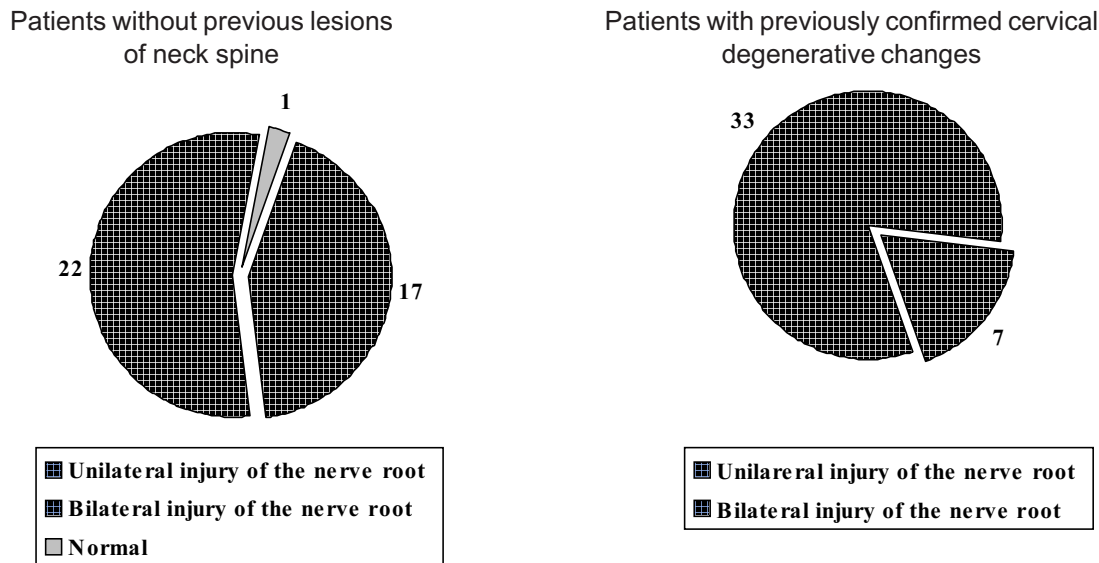


Fig. 6. Results of elektromyoneurography examination

injured persons, whiplash injury is not only a medical problem but has grown into a legal problem as well^{6,7}. The importance of the medicolegal aspect becomes ever more evident in the light of the fact that 67 per cent of injuries with normal clinical and x-ray findings of cervical spine on initial examination spend 6-7 months on sickleave and ultimately gain a high degree of permanent physical damage in lawsuits. This evidence appears to entail a final question: is it fair that patients with previous cervical degenerative changes are conceded a minor degree of permanent physical damage after whiplash injury than those who have suffered whiplash injury and had initially normal clinical and diagnostic findings?

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Sažetak

TRZAJNA OZLJEDA VRATA – MEDICINSKO-PRAVNI PROBLEM

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Trzajna ozljeda vratne kralježnice najčešće se događa u prometnim nesrećama. Djelovanjem sila dolazi do ozljeda brojnih struktura vrata. Nakon završenog liječenja zaostaje velik broj subjektivnih simptoma koji se ne mogu objektivno prikazati i stoga predstavljaju velik problem kod ocjene trajnih posljedica. Istraživanje je provedeno u nasumce izabranih 40 ozljeđenika bez prisutnih ranijih oštećenja vratne kralježnice i 40 isto tako nasumce odabranih ozljeđenika s prisutnim degenerativnim promjenama vratne kralježnice dokazane pomoću RTG. Svi su nakon doživljene prometne nesreće pretrpili trzajnu ozljedu vratne kralježnice i podnijeli zahtjev za ostvarivanje nematerijalne štete u OZ Zagreb tijekom 2001. godine. U 67% predmeta ozljeđenici su provodili liječenje tijekom 5-6 mjeseci. Nakon završetka liječenja zaostale su trajne posljedice: ograničena pokretljivost vratne kralježnice, utrnulost ruku, vazospazam vertebralnih arterija, trajno sužena vidna polja; sve prema nalazima objektivne obrade (funkcionalne radiološke snimke vratne kralježnice, elektromioneurografije ruku, transkranijске Doppler sonografije vertebrobazilarnog sliva, vidnog polja po Goldmanu te klinički pregled liječnika cenzora). U ozljeđenika s prisutnim degenerativnim promjenama vratne kralježnice liječenje je u prosjeku bilo dugotrajnije, nakon završetka liječenja imali su veći stupanj ograničenja pokreta glave i vrata, ali su u konačnici dobili u postotku manji stupanj trajnih posljedica u odnosu na ozljeđenike koji nisu imali izražene degenerativne promjene vratne kralježnice.

Ključne riječi: Trzajne ozljede – dijagnostika; Trzajne ozljede – fiziopatologija; Trzajne ozljede – zakonodavstvo i pravosuđe; Vratni kralješci, ozljede – patologija; Bolovi u vratu – dijagnostika; Nesreće, promet – prevencija i kontrola