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Professional paper

Clinical and Medicolegal Characteristics of Neck Injuries

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A B S T R A C T

The predominance in performing surgery of major spine injuries by neurosurgeons usually has the consequence of treating all types of spine injuries by neurosurgeons – neurotraumatologists. In the neurosurgical wards of Clinical Hospital Rijeka, we take care of the majority of these patients, following both the major, as well as minor – whiplash injuries of the neck. This article is an overview of the patients admitted in the one year period (October 1st 2009–October 1st 2010) where 1077 cases of neck injuries were analyzed. Vast majority of these injuries were due to traffic accidents (over 94%), and only a small proportion were serious injuries that needed a surgical approach – decompression and stabilization (č1%). We analyzed minor neck injuries thoroughly both because of the increasing number of whiplash neck injuries and because more complicated diagnostic and therapeutic protocols occupy too much time in the ambulatory practice of our neurotraumatologists each year thus representing a growing financial burden to the health organizations and to the society as a whole. Our results proved that the majority of the injured are male (over 60%), young and active (almost two thirds 21–40 years of age), had commonly sustained a Quebec Task Force (QTF) injury of grades 2 and 3 (almost 90%), and, if properly treated, recovered completely after a mean therapy period of ten weeks. Only a minority complained of prolonged residual symptoms, some of them connected with medico-legal issues (less than 20%). The results shown are in contrast with the general opinion that malingerers in search of financial compensation prevail in these cases, and leads to the conclusion that minor neck injuries (including whiplash) as well as Whiplash Associated Disorder (WAD) are real traumatological entities, that have to be seriously dealt with.

Key words: *neck injury, whiplash injury, Quebec Task Force (QTF), medicolegal issues*

Introduction

Neck injuries represent a significant diagnostic and therapeutic problem in neurotraumatology. They are consisted of two main groups: so called minor neck injuries (including QTF grade 1, 2 and 3), where the prevalent entities are typical and modified whiplash neck injury, with more than 90% of all similar injuries included, as well as major neck injuries (QTF grade 4), which contain a significantly diminished stability of the cervical spine bone-ligament system with possible neurological deficit. In the first group, treatment is nearly exclusively conservative and in the second group, mostly surgical. In 1866 J.E.Erichsen described the whiplash neck injury due to train collision for the first time, ever since, the general opinion was that the diagnosis has been grossly overstated as well as unfounded because there was no objectified diagnostic tool to prove it[1]. The distrust towards these kinds of patients has in fact been increasing in Croatia for the past twenty years, mostly because of frequent law suites connected with whiplash injuries as well as financial demands tied to its consequences.

Nevertheless, according to many authors, whiplash is an actual entity, one that affects the muscular apparatus and as well, in lesser capacity, ligamentary system. The constantly increasing number of whiplash neck injury, the increasingly complex diagnostic and therapeutic protocols each year represent an even heavier burden in the neurotraumatologist practice and eventually bring him

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to the ungrateful position of having to arbitrate between actual patients and the malingerers in search of financial benefit.

We undertook the present study in order to evaluate two aspects of the problem: first – do the symptoms in our patients point to plausible structural injuries sustained during the whiplash neck injury, and second – if the pattern of complaints in injured patients treated in the region of Rijeka indicates significant differences in groups who are involved in compensation litigation process and those who are not.

Materials and Methods

During many years of practice, whiplash neck injury patients treated at the Rijeka University Hospital have been repeatedly evaluated and followed. As we have monitored a large number of around thirty thousand patients during the past years, as well as over a thousand neck injuries, we analyzed all the data collected during the one year period of October 1st 2009 to October 1st 2010 and compared it to the adequate data collected in our court – advisors practice. All the patients were inspected by ER physicians first, followed by a neurosurgical examination and if necessary, treated for whiplash injuries. Also they were assessed according to the Quebec Task Force (QTF) injury grade (Table 1), and have had additional radiological evaluation done in emergencies. In the small part, further emergency diagnostics (computerized tomography) and emergency surgery had been done for the patients with unstable vertebrae fractures. The most part consisted of minor neck injuries, where conservative therapy and soft collar (Shantz type) immobilization had been used. From the injured documented at the ER we have followed all of the patients in the major injury group as well as 522 of the patients in the minor injury group (54% from the total of 1021) during a 12 week period (499 subjects, 46% did not come to follow – up exams). Symptoms, their duration, treatment option and epidemiological data (age, gender, the way injury was succumbed, with fractures – injured spinal segment) have been followed.

TABLE 1
QUEBEC TASK FORCE (QTF) PROTOCOL FOR EVALUATION OF THE WHIPLASH INJURY TO THE NECK

Grade	Clinical findings
0	Possibility of whiplash injury, no difficulties, no clinical signs of injury
1	Stiff or painful neck, no clinical sign of injury, no paravaertebral musculature spasm
2	Stiff or/and painful neck, paravaertebral musculature spasm
3	Grade 2 + neurological symptoms
4	Grade 2 or 3 + RTG verified instability or fracture

TABLE 2
DIAGNOSTIC AND THERAPEUTIC WORKUP

Diagnostic procedures	*Clinical evaluation (QTF) and native cervical spine X-rays in urgency clinical follow up (neurosurgeon or traumatologist)* 10 days – > 6 months additional treatment by specialists in physical therapy, neurology, psychiatry, complete audio logic and ophthalmologic work-up, functional cervical spine X-rays, CT or/and MRI; EMG, EMNG and kinesiologic EMG …
Therapeutic measures	*NSA orally and locally,* immobilization (cervical collar), physical therapy, psychological support, mild sedatives; vitamins, different analgesics, vasoactive, antivertiginous therapy…

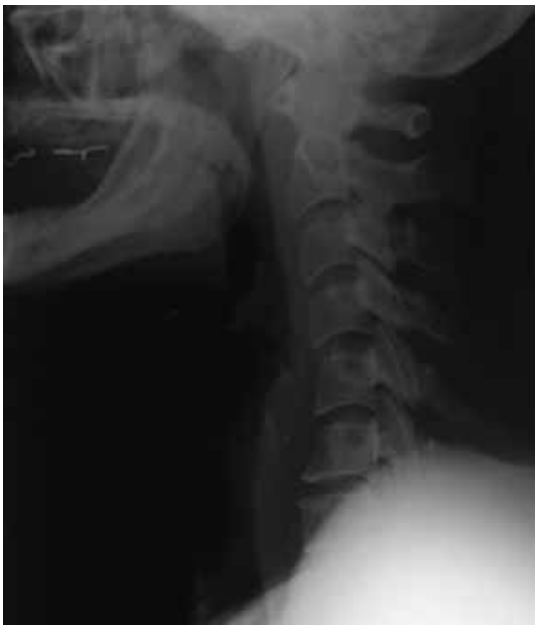

Fig. 1. Typical x-ray finding in whiplash injury qtf 1–3: loss of lordosis and no fractures or ligamentous instability.

Results

During the one year period of October 1st 2009 to October 1st 2010 1077 patients were registered with various neck injuries. Major fractures with cervical vertebrae instability have been registered rarely – in 1% of all injured (11 cases in total, or 1.02%). Minor fractures (spinous processes, transverse processes, avulsion of the vertebral body tip) have been registered in 45 of the injured (4.18%). Minor injuries (almost exclusively QTF protocol 1, 2 and 3 grade whiplash injury as is shown on Figure 1.) made up most of the cases – 1021 (94.80%). Considering all injuries, the majority were reported as a result of traffic accidents, total of 1016 (94.33%). In this group (traffic accidents), minor grade whiplash injury also constitutes the majority (947 or 93.20%). Also, the following distinction has been made depending on the occurrence of neck injury in politraumatized patients (167 cases or 15.51%):

TABLE 3
EPIDEMIOLOGICAL DATA OF THE NECK INJURIES TREATED IN CLINICAL HOSPITAL OF RIJEKA IN THE ONE YEAR PERIOD OCTOBER 1ST 2009 TO OCTOBER 1ST 2010

	Total	Unstable fractures	Stable fractures	Minor injuries (QTF grade 1–3)
Neck injury	1077	11 (1.02%)	45 (4.18%)	1021 (94.80%)
By gender	Male 649 (60.27%)	Female 428 (39.37%)		
By age	Until 20 Y. 143 (13.27%)	21–40 Y. 678 (62.97%)	41–60 Y. 148 (13.69%)	> 60 Y. 108 (10.07%)
Injury sustained by type and epidemiology	Minor injury (1021)			
	Traffic 947 (92.75%)	Other (working injuries, home and sport activity accidents – falls) 74 (7.25%)		

Males have been reported with the described injuries more often (649 or 60.27%) and the affected were mostly people of younger age – until age 40 (821 or 75.63%). Segment where we usually find fractures are the middle cervical vertebrae (C3-6), making 39 out of 56 fractures (69.64%). We evaluated the injured that were followed during the 12 week period (552 or 54%) according to the type and duration of the symptoms typical to minor neck injury and compared them to the injured that took part in judicial disputes connected to damages (101 or 18.30%) as is shown in Table 4.

TABLE 4
COMPARISON OF CHARACTERISTICS IN PURE CLINICAL AND MEDICO LEGAL CASES

Type of medical practice	Clinical	Medico legal
Number of patients	552	101
Traffic injury (%)	83.5	91.5
Conservative treatment (%)	94.3	98.9
Average medical leave (weeks)	7.5	12.5
Residual symptoms (%)		
1. stiff and painful neck	67.5	92.5
2. neurological deficit	39	54
3. headache, dizziness etc.	32.5	55.5

Discussion and Conclusion

The incidence of minor neck injuries (0.11–0.39% / year; 17–43% of all injured) is high and rising, which gives reason to worry and doubt, but still does not exceed comparable data (in USA 0.12–0.4% / year according to US Dep. of Transportation). The region of Rijeka is comprised of some 500.000 inhabitants, and there are almost 200.000 registered vehicles, so the injuries to the neck are within the expected proportion (data obtained by virtue of the County Traffic Police Department of Rijeka). As expected, we found that there is a very small proportion of cervical spine fractures that are unstable (č1%)[2,3]. A traffic accident was the mechanism of the neck injury in the vast majority (over 90%)[4,5]. Mostly young and active people, some 60% males, were involved in the accidents. Typical symptoms of the whiplash injury (Table 2.) are predominant in our population as well[6–8,12]. The outcome of the treatment still does not give us a clear-cut overview of the exceeding number of malingerers, as the literature often suggests[6,7,9–11]. In our series we had more symptoms that lasted longer in the one fifth of the injured who ended up as a litigation case. So, although aware of the problem, we still believe our patient's complaints, but we urge for clear-cut criteria both in urgency (QTF protocol, cervical spine X-rays) and in follow-up[10,11] (symptom-quantification – neck muscles and mobility, radicular, cervico-cephalic, and other symptoms, and correct evaluation of instrumental findings).

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KLINIČKE I PRAVNO-MEDICINSKE OSOBITOSTI OZLJEDA VRATA

S A Ž E T A K

Predominacija neurokirurga kao operatera prilikom operativnih zahvata kod teških ozljeda kralježnice često nosi posljedicu da se svi oblici spinalnih ozljeda tretiraju od strane neurokirurga – neurotraumatologa. Na Klinici za neurokirurgiju Kliničkog bolničkog centra u Rijeci liječimo većinu ovakvih pacijenata, nakon većih ozljeda ili manjih – trzajnih ozljeda vrata. Ovaj članak je pregled pacijenata primljenih u razdoblju od 01. listopada 2009. do 01. listopada 2010. godine gdje je analizirano 1077 slučajeva ozljede vrata. Velika većina tih ozljeda bila je posljedica prometnih nezgoda (više od 94%), dok su samo mali udio bile ozbiljne ozljede koje su zahtijevale kirurški pristup – dekompresiju te stabilizaciju (~1%). Temeljito smo analizirali manje ozljede vrata upravo zbog rastućeg broja trzajnih ozljeda vrata gdje shodno tome neurotraumatolozi svake godine veliki dio vremena troše u ambulantnoj službi provodeći složene dijagnostičke te terapijske protokole što predstavlja veliki teret, kako prema zdravstvenim organizacijama tako i za društvo u cjelini. Naši rezultati dokazali su kako su većina ozlijeđenih muškarci (preko 60%), mladi i aktivni (gotovo dvije trećine od 21 do 40 godina starosti), većinom (gotovo 90%) pretpljenih ozljeda 2 te 3 stupnja prema Quebec radnoj skupini (QTF), te ukoliko su adekvatno liječeni, potpuno su se oporavili nakon srednjeg terapijskog perioda od oko 10 tjedana. Kod nekolicine su zabilježeni dugotrajni zaostali simptomi, gdje su neki povezani sa pravno medicinskim osobitostima (manje od 20%). Prikazani rezultati su u suprotnosti sa uvriježenim mišljenjem kako u većini ovih slučajeva prevladava preuveličavanje vezano uz potraživanje novčane kompenzacije što dovodi do zaključka kako su manje ozljede vrata (uključujući trzajne ozlijede) kao i bolesti povezane sa trzajnim ozlijedama (WAD) stvarni traumatološki entiteti te se istima mora ozbiljno pristupiti.