Dynamic Chiropractic

Postconcussion Syndrome (PCS): Recent Literature

Arthur Croft, DC, MS, MPH, FACO

Those familiar with my teachings recall how, even several years ago, before the notion of postconcussion syndrome (PCS) found its way into mainstream medical literature, I encouraged practitioners to examine patients carefully, paying special attention to cranial nerves and listening for complaints characteristic of PCS. I reminded doctors that acceleration was the chief injury mechanism in mild traumatic brain injuries (MTBI). It's no surprise then that the lion's share of brain trauma is seen with automobile accidents. However, the problem has been that most specialists have not accepted the MTBI sequel of PCS as a valid clinical construct. Moreover, the limitations of our current crop of diagnostic tools is only beginning to hint at the real size of this iceberg. I'm pleased to see the gradual acceptance of this condition in mainstream literature. Following are a few of the recent and valuable contributions to our pool of literature. Space does not allow me to be as expansive as I would like.

References with Abstracts:

1. Bohnen N, Vanzutphen W, Twijnstra A, Wijnen G, Bongers J, Jolles J: Late outcome of mild head injury: Results from a controlled postal survey. Brain Injury 8(8):701-708, 1994.

Abstract: There is insufficient information about the long-term sequelae of mild head injury (postconcussional symptoms, PCS). Therefore, a questionnaire-based investigation was carried out in patients 1-5 years after mild head injury (MHI) and in non- concussed subjects in order to study the nature of long-term complaints after MHI. A three-factor model of residual subjective and psychological complaints that contained a dysthymic factor, a vegetative/bodily complaints factor, and a cognitive performance factor were identified in the patient population. Three rating scales were constructed from the relevant items or factors, and were used to compare the MHI patients with non-concussed controls. It was found that the profile of distresses and discomforts mentioned by a population of MHI patients 1-5 years after the trauma was similar to that of a non-concussed control population. These symptoms were indistinguishable from those encountered in ordinary everyday life. These symptoms were significantly more severe in the MHI patients. Stepwise regression analysis in the patient population indicated that a number of parameters were statistically of predictive importance: comorbidity, sex, and neurological complication at the time of the trauma. The results support the hypothesis that MHI may not ever be completely reversible.

2. Evans RW, Evans RI, Sharp MJ: The physician survey on the postconcussion and whiplash syndromes. Headache 34(5):268-274, 1994.

Abstract: Background: The postconcussion syndrome (PCS) and whiplash syndrome (WS) have been controversial topics among physicians for many decades. There is little information available on the opinions and practices of physicians. Methods: In June of 1992, we performed a national survey by mail of the four physician groups most commonly treating these problems. The number of respondents and response rates were as follows: family physicians, 118, 16 percent; neurologists, 100, 21 percent; neurosurgeons, 97, 23 percent; orthopedists, 82, 13 percent. The

survey instrument contained items on demographics, definitions, causation, prognosis, medico-legal aspects, testing, and treatment. Results: Only a minority of respondents believe that PCS and WS are clearly defined syndromes. A substantial minority report that psychogenic and litigation factors are most responsible for the conditions. Most of the physicians believe that PCS and WS have a 3-6 month recovery time. A significant minority concur that symptoms of the two syndromes resolve when litigation is settled. Most of the physicians order tests to rule out pathology although a minority order tests to reassure patients or because of litigation concerns. Only a minority of respondents believe that effective treatments are available. Not surprisingly, a multitude of conventional and unconventional treatments are sometimes recommended. Conclusions: Many aspects of PCS and WS are controversial among treating physicians. This controversy can have a profound impact on the quality and cost of patient care. Ongoing research is required to discover more effective treatments for mild brain injury and chronic pain.

3. Levin HS: Head trauma. Current Opinion in Neurology 6(6):841- 846, 1993.

Abstract: Progress in research includes studies concerning the pathophysiology and outcome of pediatric head injury, the pathology of the hippocampus in fatal injury, and the use of multivariate statistics to predict outcome in survivors. Recent research has confirmed and extended findings regarding the differential effects of closed head injury, depending on the age of the individual. These studies indicate that the consequences of head injury are more severe in older adults and in children younger than two years. Neuro-imaging findings include evidence for delayed brain injury as a major cause of mortality and disability. Functional brain imaging provides evidence for cerebral dysfunction that is not appreciated by structural brain imaging techniques and may have a stronger relationship to neurobehavioral sequelae. The neurobehavioral sequelae frequently implicate frontal dysfunction, even in the absence of structural findings on computed tomography or magnetic resonance imaging. Studies of mild head injury have expanded our knowledge concerning the pathogenesis of postconcussional symptoms, including a pre-injury vulnerability based on recent life events. Persistent postconcussional symptoms after mild head injury are frequently associated with emotional disturbance of clinical proportions.

4. Mittenberg W, Burton DB: A survey of treatments for postconcussion syndrome. Brain Injury 8(5):429-437, 1994.

Abstract: A survey of the members of the National Academy of Neuropsychology and the International Neuropsychological Society was conducted on current treatment approaches for postconcussion syndrome. The interventions that were found useful most frequently included education about the effects of head injury, reassurance that the symptoms are part of the normal recovery process, and support in coping with reactions to the symptoms. Graded resumption of activity, antidepressant medication, and cognitive restructuring were also regarded as useful. The relationships between type of treatment, factors contributing to the syndrome, ratings of treatment effectiveness, and duration of treatment were discussed.

5. Packard RC, Ham LP: Posttraumatic headache. Journal of Neuropsychiatry and Clinical Neurosciences 6(3):229-236, 1994.

Abstract: The authors review posttraumatic headache (PTH). The most common symptom following head injury, PTH is paradoxically most severe after mild head injury. Although most cases resolve within 6-12 months, many patients have protracted or even permanent headache. Because PTH generally has no objective findings, it is often controversial whether the symptom is "real," "psychogenic," or "fabricated." Despite persisting beliefs by physicians, attorneys, and insurers that PTH resolves upon legal settlement, recent studies have shown that "permanent" PTH is usually still present several years after a legal settlement. Often PTH affects family life, recreation,

and employment. Patients require education and support as well as appropriate evaluation and treatment.

6. Packard RC, Ham LP: Promising techniques in the assessment of mild head injury. Seminars in Neurology 14(1):74-83, 1994.

Abstract: Closed head injury may result in varying degrees of brain injury, from slight to severe and irreversible. Severe or even moderate head injuries often result in obvious structural damage, which is usually easily detected by imaging or neurophysiologic assessment. Mild head injuries (MHI; defined by Rimel et al.1 as a period of unconsciousness less than 20 minutes, a Glasgow Coma Scale of 13 or greater, a negative neurologic examination, and a duration of posttraumatic amnesia less than 48 hours) are typically more subtle. In spite of persisting symptomatology, there is typically no anatomic evidence of injury as traditionally assessed.2,3 (See Young and Silberstein in this issue of Seminars). A variety of distressing symptoms often follow MHI or neck injury. The most common are headache, dizziness, impaired concentration, memory difficulties, fatigue, irritability, depression, and anxiety.2-5 Paradoxically, individuals sustaining MHI often have more intense posttraumatic symptoms than those who sustain more severe head injuries.3 The persistence of these symptoms often results in feelings of distrust from the public, the legal profession, insurance companies, and even other physicians.4,6 Even in the face of legitimate posttraumatic symptoms, patients may still be labeled as "accident neurosis," "personality disorder," or "malingering in order to receive compensation." New technologic advances in experimental head injury and neuro-imaging techniques have revealed that even MHIs result in subtle changes in the structure and physiology of the brain.7,8 Such cerebral alterations may explain the persistence of memory difficulties, depression, distractibility, dizziness, and headache. Traditional studies, however, including radiographs, electroencephalography (EEG), computerized tomography (CT), and magnetic resonance imaging (MRI) are often normal in MHI. Transcranial Doppler (TCD), positron emission tomography (PET), single photon emission computerized tomography (SPECT), and quantitative analysis of EEG and evoked potentials (brain mapping) have only recently become available for clinical use. These new and promising techniques will be reviewed in detail in this article.

7. Romodanov AP: Visceral Diseases as a Sequela of Brain Damages. Vestnik Rossiiskoi Akademii Meditsinskikh Nauk (1):12-15, 1994.

Abstract: In the late period even following mild closed brain injury, diseases of the viscera and the body's systems develop as a result of diffuse lesions in the brain regions. Experimental studies have shown that this is associated with impaired self- regulatory mechanisms responsible for energy metabolic processes in the brain.

8. Ruff RM, Crouch JA, Troster AI, Marshall LF, Buchsbaum MS, Lottenberg S, Somers LM: Selected Cases of Poor Outcome Following a Minor Brain Trauma: Comparing Neuropsychological and Positron Emission Tomography Assessment. Brain Injury 8(4):297-308, 1994.

Abstract: Neuropsychological residua are common particularly in the early stages following a minor traumatic brain injury (TBI), however, a minority of individuals complain of persistent deficits following months or years post-accident. Nine such cases are presented with little or no evidence of brain damage demonstrated according to nonfunctional neuro-imaging (for example CT, MRI), yet their neuropsychological examinations were positive. Since the introduction of positron emission tomography (PET), which captures a functional approach, the question arose as to what extent the two techniques (i.e., PET and neuropsychological examination) are interrelated. All nine minor TBI cases revealed a corroboration between the positive neuropsychological findings confirmed on the PET. The PET procedure documented neuropathology which frequently was

pronounced in the frontal and anteriotemporo-frontal regions. Moreover, no significant differences were evident between those five cases with reported loss of consciousness vs. those four cases without.

Arthur Croft, DC, MS, FACO
San Diego, California

APRIL 1995