

Head Trauma and Posttraumatic Epilepsy in Slavonski Brod, East Croatia, 1988–2008

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ABSTRACT

Posttraumatic epilepsy is result of head trauma. The aim of our research was to establish how many patients after head trauma developed posttraumatic epilepsy (PTE). Retrospectively we analyzed 50 patients with head trauma different severity in period from 1989. to 2008., which we verified radiological, electroencephalographic, and psychical changes were established according to psychiatric examination. From 50 patient with head trauma, 40 developed seizures (3 in the first 24 hours and 6 after first 24 hours to the end of first week, 31 after first week). By introducing antiepileptic therapy (AETH), 30 patients were seizure free, 10 patients had 1–2 epileptic seizure monthly (EPA/CPA), 10 patients got prophylactic AETH in period 6–12 months. 14 patients developed psychical changes which were verified by psychiatrist. The experience and literature show that posttraumatic epilepsy is good for treating with 1 or 2 antiepileptic, and remission is more difficult in case psychiatric comorbidity.

Key words: epilepsy, Croatia, prognosis, trauma, therapy

Introduction

Head trauma is one of the causes of symptomatic posttraumatic epilepsy (PTE), and risk of PTE depends on severity of head trauma, but on genetic predisposition, too. Head traumas are divided into opened (dura damaged) and closed (dura not damaged).

Traditionally, posttraumatic seizures are: immediate, early and late. Immediate occurs in first 24 hours from head trauma, early between first 24 hours until the end of the first week, and the late after the first week of head trauma¹. Closed head trauma mostly happen in civilian-peace circumstances, in traffic accidents, by falling, during making sport and recreation.

Mild trauma is defined as head trauma with loss of conscious or posttraumatic amnesia less than 30 min., without skull fracture, and is not associated with greater risk for PTE. Moderate head trauma is associated with loss of conscious or posttraumatic amnesia longer than 30 min, without skull fracture, with risk for PTE 1–4%¹. Severe head trauma is associated with loss of conscious or posttraumatic amnesia longer than 24 hours, with skull fracture and/or intracranial bleeding or cerebral contusion, with risk for PTE 10–15%¹.

The risk for epileptic seizures is the greatest during the first year after head trauma, with most frequency 4–8 months after trauma, and will be lower in the following years. After 10 years only severe traumas are still risk for PTE¹. Posttraumatic epilepsy is more frequent after open head injury, for example penetrating traumas, especially front and temporal brain region^{1–8}.

Patophysiological changes of posttraumatic etiology are complex. The kinetic energy is transferred during trauma to brain tissue, produces pressure which disrupt the brain tissue and lead to histopathological changes, including: gliosis, axonal retractive changes, Wallerian degeneration and cystic white matter lesions. Iron released from hemoglobin generated free radicals which destroy cell membrane, cause intracellular calcium oscillation^{5–12}. Hippocampal damage leads to secondary excitability due to the death of the inhibitory dentate hilar neurons. Hyperexcitability during some months can lead to reorganisation of excitatory pathways (mossy fibre sprouting) and development of refractory epilepsy. The risk growth with positive family anamnesis for epilepsy. There are still existing controversies concerning prophylactic

application of antiepileptic drugs after head trauma. They use obligatory if immediate or early seizure occurs, even they have no influence on late posttraumatic epileptic seizures (PTE) – do not reduce the risk¹³⁻²¹. That means, in a latent period between head trauma and development of PTE, duration months or longer, epileptogenesis can occur.⁸⁻²¹

Patients and Methods

Our research was retrospectively. From 1000 registered epileptic patients in ambulance from Slavonski Brod and closer area, which include 130 000 citizens, 50 patients had head trauma different severity. From 50 patients, 45 were men and 5 women in age 18–71 years, 4 mean 42.3 years. Patients were followed from 1988–2008. Head traumas were more frequent in the period from 1991–1996. During Homeland war and mostly injured were Croatian soldier, men in age 19–39 years, mean 22.4 years. We analyzed: the severity of head trauma, the time between trauma and epileptic seizure, type of the seizure, number of seizures before and after administration antiepileptic therapy, number of administered antiepileptic drugs, psychical changes.

Results

Concerning type of head trauma, they occurred: mild brain trauma in 17 patients (34%), moderate in 12 patients (24%), severe head trauma in 21 patients (42%) (Figure 1). In period from 1988–1997 happened 36 traumas, mostly in war circumstances in our area 1991–1996, from 1998–2007 14 traumas (28%). Concerning the time

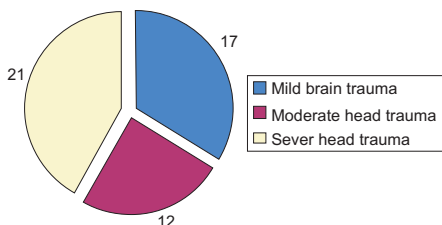


Fig. 1. Types of head traumas.

between head trauma and epileptic seizure: 3 patients (6%) developed seizure in first 24 hours-immediate, 6 patients (12%) developed seizures in time between 24 hours and the end of first week of trauma-early, and 31 (62%) patients developed seizures after first week-late. Late epileptic seizure we analyzed according time of develop first epileptic seizure: in first year after trauma 11 patients (22%), in second year after trauma 5 patients (10%), from 3–5 years after trauma 7 patients (14%), from 6–10 years after trauma 5 patients (10%), after 10 years 3 patients (6%) from total number of patients with head trauma. 10 patients (20%) were without seizure after head trauma (Figure 2).

According to the type of seizure: generalized tonic-clonic attacks (GTKA) we found in 16 patients (32%),

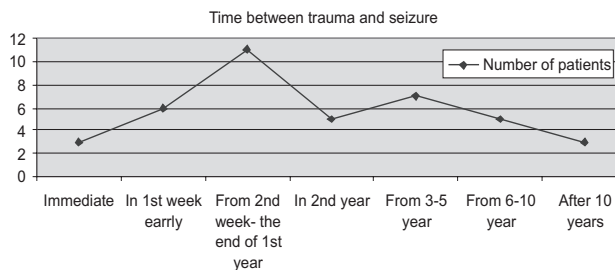


Fig. 2. Time between trauma and seizure.

complex partial seizure with second generalization in 10 patients (20%), complex partial seizures (CPA) in 7 patients (16%), elementary partial seizures with second generalization in 4 patients (14%), elementary partial seizures(EPA) in 2 patients (6%), EPA which evolving in CPA in 1 patient (2%) (Figure 3).

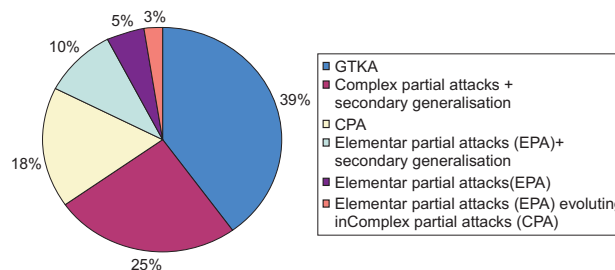


Fig. 3. Types of seizures.

The number of seizure before introducing antiepileptic were 1–10 different seizure, and after introducing antiepileptic were 1–2 EPA/CPA in 10 patients.

Number of epileptic seizure before antiepileptic therapy was 1–10, after introduction of antiepileptic therapy are rare, in 5-years interval, on 1–2 EPS/ CPS monthly in 10 patients, from which 8 patients had psychiatric comorbidity, others were without seizures. 10 patients after CCI did not have seizures. Prophylactic antiepileptic therapy applied in 10 patients 6 months – 1 year, without late seizure event.

According the number of antiepileptic: monotherapy was in 21 patients (42%), two antiepileptics in 17 patients (34%), three in 2 patients (4%).

Psychic changes: 10 patients developed depressive disorder (20%), 3 patients psychosis (6%), 1 became addicted to narcotics (2%).

Discussion and Conclusion

PTE is a serious problem for epileptic patients and his families, because of many limitations and influence on quality of life: limitations by employment, dependence about parents, loss of social contacts, no driving license.

The similar experiences we found in study with Vietnam war veterans, in war Iraq-Iran, etc.⁸⁻¹⁵. Higher

number of head traumas were between 1991–1996 we explain by traumas during of Homeland war.

Posttraumatic epilepsies responding well to treatment, usually one or two antiepileptics, with more difficult remission in case psychiatric comorbidity.

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TRAUMA GLAVE I POSTTRAUMATSKA EPILEPSIJA U SLAVONSKOM BRODU, ISTOČNA HRVATSKA, 1988.–2008.

SAŽETAK

Posttraumatska epilepsija je posljedica ozljede glave. Cilj našeg istraživanja bio je utvrditi koliko je bolesnika izloženih traumi glave razvilo posttraumatsku epilepsiju. Retrospektivno smo analizirali 50 bolesnika sa doživljenom traumom glave različitog intenziteta u razdoblju od 1988–2008. godine, koju smo verificirali radiološki, elektroencefalografski, a psihičke promjene psihijatrijskim pregledom. Od 50 traumatiziranih bolesnika, 40 je razvilo napadaje (3 u prvih 24 sata, 6 od prvih 24 sata-prvih tjedan dana, 31 nakon prvog tjedna). Uvođenjem antiepileptičke terapije 30 bolesnika bilo je bez napadaja, 10 bolesnika imalo je 1–2 napadaja mjesečno (EPA/CPA). 10 bolesnika uzimalo je anti-epileptičku terapiju 6–12 mjeseci nakon doživljene traume glave. 14 bolesnika razvilo je psihičke promjene verificirane od strane psihijatra. Iskustvo i literatura pokazuju nam da je posttraumatska epilepsija dobra za liječenje, uglavnom uz 1 ili 2 antiepileptika, uz teže postizanje remisije u slučaju psihijatrijskog komorbiditeta.