

Neurophysiological Features of Viral Encephalitis in the Elderly Patients

D. T. Abdukadirova,

M. Sh. Xojiimatova.

Department of Neurology
Andijan State Medical Institute.

ABSTRACT

Acute viral encephalitis (OVE) is characterized by severe course, high mortality rate, and high frequency of neurological complications of a disabling nature. We examined 48 elderly patients with manifestations of primary and secondary encephalitis complicated by convulsive syndrome. The presence of repeated epileptic seizures or status epilepticus that are persistent and cannot be stopped by conventional antiepileptic drugs in elderly patients with acute encephalitis requires a comprehensive clinical, electrophysiological and neuroimaging examination in the dynamics of the disease in order to determine the localization of structural changes in the brain and the possibility of preventing the development of severe complications of cerebral coma and mortality.

Острый вирусный энцефалит (ОВЭ) характеризуется тяжестью течения, высоким уровнем летальности и большой частотой неврологических осложнений инвалидизирующего характера. Нами было обследовано 48 больных пожилого возраста с проявлениями первичного и вторичного энцефалита, осложнёнными судорожным синдромом. Наличие повторных эпилептических приступов или эпилептического статуса, носящих упорный характер и не поддающихся купированию обычными противоэпилептическими препаратами у пожилых пациентов с острым энцефалитом требует проведения комплексного клинико-электрофизиологического и нейровизуализационного обследования в динамике заболевания с целью определения локализации структурных изменений в головном мозге и возможности предупреждения развития тяжёлых осложнений церебральной комы и летальности.

In the structure of infectious diseases of the nervous system, acute viral encephalitis (OVE) accounts for about 20-30% (Dekonenko E. P. 2011). 65% of them occur in the elderly. The need to study this group of diseases is due to the severity of the course, a high mortality rate (10-20%) and a high frequency of neurological complications of a disabling nature (Skripchenko N. V. 2014), possibly due to low immunobiological reactivity of the body.

Epileptic seizures are noted in the clinical picture of most acute viral encephalitis, often being the first clinical symptom of the disease. However, it is necessary to distinguish between convulsions in the acute

ARTICLE INFO

Received: 6th September 2023

Revised: 6th October 2023

Accepted: 10th November 2023

KEY WORDS:

Encephalitis, meningoencephalitis, virus, epilepsy, convulsive syndrome

энцефалит, менингоэнцефалит, вирус, эпилепсия, судорожный синдром.

period, which in most cases pass without a trace, and the formation of symptomatic epilepsy in people who have had viral encephalitis (Petrukhin A. S. 2010).

Based on the specific features of the pathogenesis of acute viral encephalitis, the risk of recurrent epileptic seizures during convalescence is significantly higher in primary encephalitis. This is due to a local necrotic process mainly in the gray matter of the brain with the formation of structural defects, the presence of which can cause the formation of a persistent focus of pathological activity in the residual period.

The frequency of epileptic seizures in the acute period of viral encephalitis of various etiologies in elderly patients was: in primary encephalitis - 88.6%, in secondary encephalitis-40% (Dekonenko E. P. 2005).

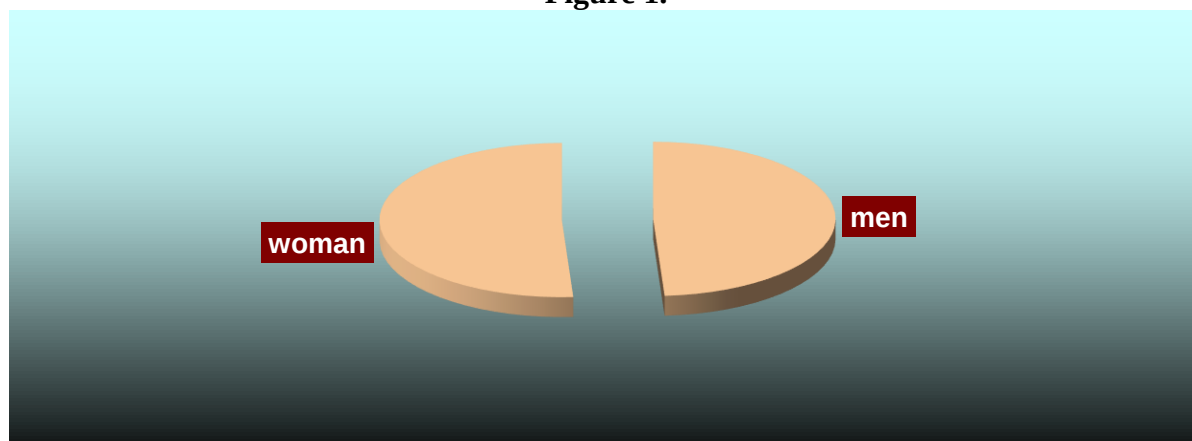
Although in secondary, acute disseminated encephalitis (ODEM), there is a predominant lesion of the white matter of the brain and neurons, as a rule, do not suffer, in the acute period of the disease, epileptic seizures are also noted, which can in some cases take the character of an epistatus. Prolonged epileptic status in the clinical picture of secondary viral encephalitis in elderly patients leads to worsening of cerebral edema, metabolic disorders with possible secondary damage to neurons. Therefore, these patients cannot be excluded from the risk group of recurrent epileptic seizures during the convalescence period.

The clinical features of epileptic seizures in the acute period of viral encephalitis of various etiologies in elderly patients have not been sufficiently studied to date. Prognostic signs of the development of symptomatic epilepsy and transformation of epileptic seizures in the early and long-term periods of acute viral encephalitis have also not been studied (Shavlovskaya O. V. 2013, McGrath N. 1997). Early diagnosis of symptomatic epilepsy and timely administration of adequate treatment in accordance with the form of the disease will prevent the formation of a stable epileptic system and significantly improve the prognosis. This indicates the relevance of our research.

Objective: to determine the clinical significance of epileptic seizures in the acute period of OVE, to assess the risk of developing epilepsy in convalescents, and to determine the timing of medical examinations and treatment tactics.

Research results: To achieve this goal, we examined 48 elderly and middle-aged patients with manifestations of primary and secondary encephalitis, aged 52-80 years. The median age was 66 ± 3.4 years. The ratio of men and women was almost equal (Figure 1). All patients underwent clinical-neurological, paraclinical, neuroimaging and laboratory tests.

Figure 1.



Primary encephalitis was characterized by partial seizures characterized by clinical polymorphism. The occurrence of epileptic seizures in the acute period of viral encephalitis in elderly patients is to a certain extent a pathohomonic symptom, which can be taken into account in the differential diagnosis of encephalitis from other diseases.

In case of viral encephalitis in elderly patients, in contrast to young patients, structural changes in the brain substance determined by neuroimaging were observed in all cases of observation. Subsequently, the formation of postnecrotic cysts was noted during the convalescence period. Elderly patients with a progressive

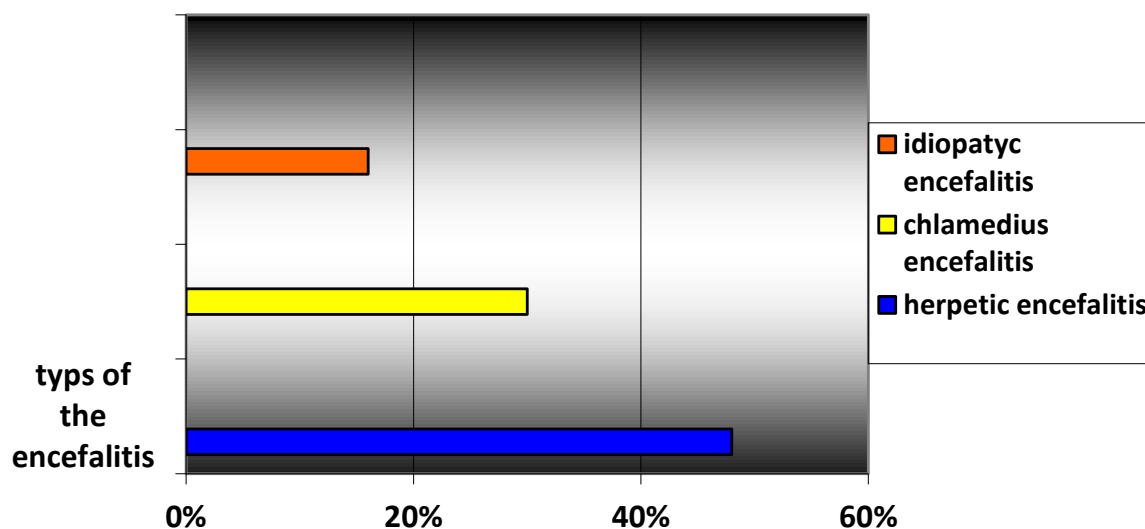
form of primary encephalitis are characterized by the formation of local cortical atrophy after a minimum of 5-6 months, a maximum of 1 year from the appearance of myoclonus.

In secondary encephalitis, changes in the brain in the form of expansion of the CSF system and signs of non-occlusive hydrocephalus were detected according to neuroimaging studies in $40\% \pm 3.4\%$ of elderly patients, probably due to edema of the brain substance and inflammatory changes.

Acute viral encephalitis is characterized by polymorphism of EEG manifestations that are not nosologically specific, but reflect the severity and locality of brain damage. With a benign course of encephalitis, $36\% \pm 4.4\%$ normalized brain bioelectric activity during the period from 4 weeks to six months, while taking anticonvulsants, and with an unfavorable course in $38\% \pm 5.6\%$, EEG changes acquired an epileptiform character with the presence of prolonged regional deceleration and foci of spike-wave activity.

The risk of developing symptomatic epilepsy in the studied groups of patients in the early and long-term periods of acute viral encephalitis was: in herpetic encephalitis - $48\% \pm 2.4\%$, in chlamydial encephalitis - $30\% \pm 3.3\%$, in encephalitis of unknown etiology - $16\% \pm 2.3$ (Fig. In herpetic encephalitis, the probability of SE is higher in elderly patients with unilateral brain damage.

Figure Error! Bookmark not defined.



The highest risk of developing symptomatic epilepsy after primary and secondary encephalitis is observed in the period up to six months from the onset of the disease, which determines the timing of medical examinations of convalescents. Isolated cases of development of symptomatic forms of epilepsy after 5 years of follow-up in patients with viral encephalitis were noted only in the presence of postnecrotic cysts during neuroimaging and epileptiform activity on the EEG.

Table 1. Neuroimaging and electroencephalographic data of patients with encephalitis during treatment (after 6 months).

#	signs during	MRI			EEG		
		Expansion of zheludochki	Periventricular dilation Periventricular edema	Necrotic cysts	Epileptiform activity		Normalization
					Teta wave normalization	Wave	
1	Benign course of encephalitis	25%	-	-	-	-	36%
2	Malignant course of encephalitis	38%	100%	38%	-38	%	-

The presence of repeated epileptic seizures or epileptic status of partial seizures that are persistent and cannot be stopped by conventional antiepileptic drugs in elderly patients with suspected acute viral encephalitis requires exclusion of the viral etiology of the disease.

According to Russian authors, patients with encephalitis and meningoencephalitis associated with herpes simplex virus and cytomegalovirus, whose condition was more severe and ended in 50-80% of cases with a fatal outcome and the development of gross brain defects in survivors, were found to have epileptic syndromes in 45% of cases. Neuroimaging of the brain revealed ventricular dilation, periventricular edema, and atrophic hydrocephalus. Secondary porencephalic cysts were detected in 5.8%, and 4.2% had chronic subdural hematomas (O. A. Shavlovskaya, 2013). In 10% of cases, encephalitis occurred with acute cerebral circulatory disorders of the hemorrhagic type (Dekonenko E. P. and co-authors 2011). In 40% of cases of encephalitis, symptomatic epilepsy and epileptic syndromes in the form of partial or generalized seizures were observed in the recovery period (Skripchenko N. V. and co-authors 2014). These studies were conducted in middle-aged individuals and in children under one year of age.

Thus, our research coincided with the paraclinical and neuroimaging data of other authors' studies.

Conclusions: 1. In patients with acute encephalitis of viral etiology, it is advisable to conduct a comprehensive clinical, electrophysiological and neuroimaging examination in the dynamics of the disease in order to determine the localization of structural changes in the brain and the possibility of preventing the development of a chronic course of infection.

2. A significant risk of developing symptomatic epilepsy in the early period of convalescence after primary encephalitis requires clinical and electrophysiological observation of patients for at least 12 months, and of course, when detecting epileptic brain activity according to EEG data, without paroxysms, dynamic monitoring is necessary with the appointment of antiepileptic therapy in accordance with the form and severity of the convulsive syndrome.

Literature.

1. Anzimirov V. L., Arzipova N. A., Boldyreva G. N. Neyrofiziologicheskie issledovaniya v klinike [Neurophysiological studies in the clinic].
2. Dekonenko E. P. Herpetic encephalitis. Nevz zhurnal 2005, no. 3, pp. 4-9.
3. Zenkov L. R. Kozhevnikov's epilepsy or Rasmussen's syndrome. -2001. - No. 2. - pp. 58-63.
4. Zenkov L. R. Clinical electroencephalography with elements of epileptology // Moscow, 2002, pp. 185-195.
5. Lobzin Yu. V., Prilipenko V. V., Gromyko Yu.:N. Meningitis and encephalitis.-Saint Petersburg:Folio, 2003. -123 P.
6. Mikhailenko A. A., Pokrovsky V. I. Edema-swelling of the brain in comatose states in infectious patients. M. Meditsina-1997. - 352 P.
7. Nadezhdina M. V. Clinic of acute and chronic forms of tick-borne encephalitis, optimization of treatment in the acute period (clinical and physiological study). // Author's abstract of the dissertation of the Doctor of Medical Sciences. - Yekaterinburg. -2001.
8. Petrukhin A. S. Clinical neurology. Medicine-2000
9. Skripchenko N. V., Murina E. A., Goleva O. V. Modern diagnostics of mixed herpesvirus infection in children with viral encephalitis. 2017.
10. Starchenko A. A. Klinicheskaya neyroimmunologiya khirurgicheskikh zabolevaniy golovnogo mozga [Clinical neuroimmunology of surgical diseases of the brain]. - 2001-h 1,2.
11. Shavlovskaya O. A. Viral encephalitis associated with cytomegalovirus and herpes simplex virus type 1 in a 46-year-old woman. 2013.
12. Yelnik J. Functional Anatomy of the Basal Ganglia /J.Yelnik // Mov. Disord. 2002. - Vol. 17. - Suppl. 3 - P. S15-S21.
13. Whitley R.J., Kimberlin D.W. Viral encephalitis. Pediatr Rev, 1999, v.20:192-198.