



ORIGINAL RESEARCH PAPER

Neurology

CLINICAL CHARACTERISTICS AND EEG FEATURES OF NON-CONVULSIVE STATUS EPILEPTICUS (NCSE) AFTER CARDIOVASCULAR SURGERY

KEY WORDS:

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ABSTRACT

One of the most frequent complications after cardiovascular surgery are different types of epilepsy seizures during coma (GCS <8). Manifestation of coma might be result of hypoxic brain injury. It is very important to make early diagnose of exact type of complications and immediately start appropriate treatment. There are several difficulties in identification of non-convulsive status epilepticus (NCSE) during coma that is why in all of these cases we are using Specific clinical and Electrophysiological examinations.

Materials And Methods: There were 42 patients with persistent coma after cardiac surgery under our clinical observation. Aged between 36-82. Patients underwent one of the following surgeries: coronary artery bypass graft surgery (CABG) in 27 patients, valve surgery - in 9 cases. In 6 cases there were used Surgery of ascending aorta and aortal arch. 40 patients have been undergone cardiopulmonary bypass (CPB) during cardiac surgery. Following methods were used :

- Clinical neurological status evaluation
- Computer tomography (CT scan)
- Long-term EEG

Results: Non-convulsive status was discovered in 9 cases. Patients with the NCSE were separated into three groups: First, 3 patients with nystagmoid eye jerking and facial muscles twitching. Second: in 4 cases there were twitching of the limb. Third: 2 patients didn't have any movement clinical symptoms.

Conclusion: As we see Cardiovascular surgery might cause neurological especially epileptiform type of complications during coma. These types of complications include non-convulsive epileptic status. Each patient needs immediate EEG examination for early diagnose and correct treatment of this condition.

BACKGROUND:

Cardiac surgery acts as a risk factor in neurological complications. Mostly these damages are associated with cardiopulmonary bypass (CPB). Nowadays, persistent coma is mostly important for diagnostic treatment, which follows different types of cardiac surgery. Diagnosis of these conditions are complicated. Mostly attentive is non-convulsive epileptic seizures. The diagnosis of non-convulsive status epilepticus (NCSE) can be difficult, and is dependent on EEG.

Non-convulsive status epilepticus can follow convulsive status epilepticus, and is a significant treatable cause of persistent coma following convulsive status epilepticus. Almost entirely clinical manifestation of the NCSE is like a twitching of the limbs or facial muscles or nystagmoid eye jerking, which can result from hypoxic brain damage, were often collectively directed to a subtle motor status epilepticus. Up to 8% of patients in coma who have no outward signs of seizure activity are in non-convulsive status epilepticus. The diagnosis is often questionable, because in many examples burst-suppression patterns, periodic discharges and encephalopathy triphasic patterns has been proposed to represent electrographic status epilepticus. All mentioned above mostly indicate underlying widespread cortical damage or dysfunction. It has well known that the NCSE in coma is categorize into three groups: First: who had convulsive status epilepticus, second: who have subtle clinical signs of seizure activity and third: who do not have any clinical signs.

Convulsive status epilepticus has, as a part of its evolution, subtle status epilepticus in which there is minimal or no motor activity but progressing electrical activity. The association of electrographic status epilepticus with subtle motor activity often follows hypoxic brain activity and has a poor prognosis, but aggressive anticonvulsive therapy and increased anesthesia was perhaps vindicated, since the little evidence available shows that such treatment ameliorates prognosis.

Which one the status epilepticus or widespread cortical damage is important in the process of developing of the persistent coma? Despite of the poor prognosis aggressive treatment was recommended in the hope that it may improve outcome. In some groups of patients, there are clinical signs of repetitive movements, but no electrographic seizure activity. In these cases, antiepileptic treatment and aggressive sedation were not recommended.

Table 1

Surgery Type	Non-Convulsive Status Epilepticus	Focal Epileptic EEG Findings	Generalized Epileptic EEG Findings	Ischemic Stroke
CABG	5	1	2	-
Surgery of valve	2	2	1	-
Surgery of ascending aorta and aortal arch	2	-	1	2



Figure 1A

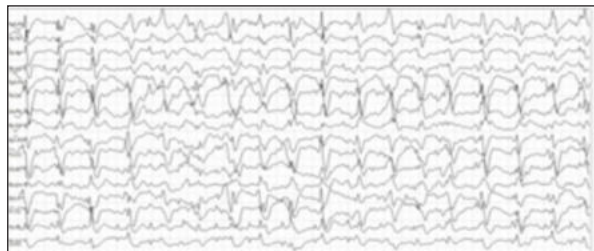


Figure 1B

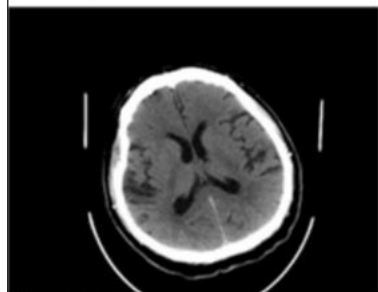


Figure 2A



Figure 2B

Table 1 indicates redistribution of the NCSE according to the types of cardiac surgery. In addition, it shows EEG findings. All patients have undergone the anti-convulsive medicine and increased deep anesthesia.

Figure 1 shows EEG changes of a 57-year-old man, who underwent through the surgery of ascending aorta and aortic arch. During the operation CPB were used, which lasted about an hour. There was arterial hypertonia on the anamnesis. 7 hours after the operation the facial muscle jerking was triggered. We did not find any kind of changes on the CT scan Figure 2

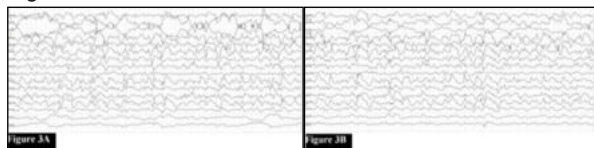


Figure 3 Shows EEG Changes After 2 Months. In This Case, The Development Of Persistent Coma Is Without Positive Dynamic.

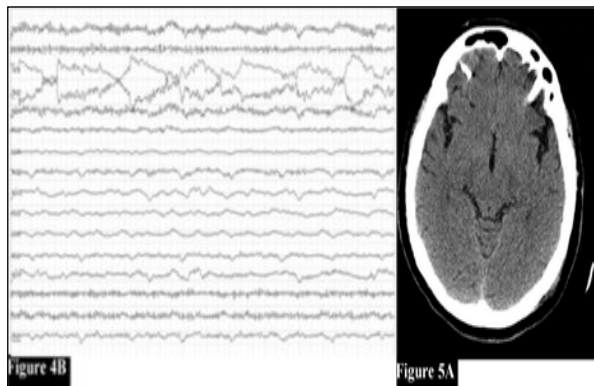


Figure 4A

Figure 4B

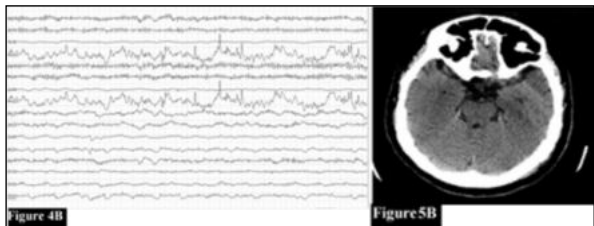


Figure 4B

Figure 5B

Figure 4 shows EEG of a 62-year-old man, who underwent artery bypass graft surgery. In this case, the rhythmic movement of facial muscle was triggered, along with the nystagmoid eye-jerking. These clinical signs appeared as soon as the anesthesia started to wear off. In this case, there was no acute pathologic damage found on the CT Scan Figure 5

Summary:

Cardiac surgery represents a significant risk to the nervous system through various mechanisms. Despite of the fact that the NCSE remains low, the causes and management are very important. Timely evaluation of this statement defines the ongoing prognosis. Prospective studies of long-term EEG monitoring after cardiac surgery were warranted to better establish the frequency of seizures and their clinical consequence. As it was mention above, cardiac surgery might cause some neurological complication. Early diagnosis of NCSE is very important in patients with persistent coma. Outlet of coma depends on timely treatment of this complication.

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