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In Shortly about Epilepsy

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Abstract

Epilepsy is one of the most common diseases in neurology, which due to its characteristics presents a serious medical and social problem. Epilepsy presents chronic stroke cell disorders, which for a variety of reasons become “predictable” and respond to synchronous electrocution impulses, manifested by epileptic seizures.

The aim of this paper is to meet people with one of a malignant neurological disease. The attack of epilepsy can occur at any time of day and in any place. That is reason why people should know symptoms of epilepsy. When they know them, they can help the suffer.

Keywords: Diagnosis; Epilepsy; Treatment

Introduction

The aim of a neurological history and examination is to locate the area of damage within the nervous system and then, on the basis of the tempo of the history, to make an attempt at diagnosis [1].

The nervous system comprises the cerebral cortex, brain stem, cerebellum, spinal cord, roots and peripheral nerves. The term ‘neuraxins’ is often used to encompass the cerebral cortex, brain stem, cerebellum and spinal cord, alternatively known as the central nervous system (CNS) in contradistinction to the spinal nerve roots and the nerves which they eventually form, the neuromuscular junction and muscle, which collectively is known as the peripheral nervous system (PNS). Information is received into the brain via the senses (vision, hearing, smell, touch). The response from the nervous system to stimuli perceived by the senses is either in the form of speech or movement. On this basis, there are therefore major ascending pathways within the spinal cord, brain stem and cortex which convey information from the periphery to the brain.

Similarly, there are major pathways within the brain conveying information from vision to the appropriate part of the brain which deals with the vision in the occipital cortex. The major

motor pathway runs from the cortex down through the brain stem and spinal cord, and ends on the anterior horn cells on the peripheral nerves. Activation of this pathway produces movement. The brain can therefore be considered as a ‘wiring diagram’ with descending pathways, ascending pathways and horizontal pathways which, within the brain, are the cranial nerves and, in the spinal cord, are the nerve roots. Attempting to make a diagnosis, therefore, is often a matter of identifying the point of intersection between ascending and descending pathways and horizontal pathways.

Neurological Symptoms

The medical profession in its training as well as in everyday practice takes a fundamentally therapeutic attitude to its patients [2]. The aim is perceived to be the diagnosis and assessment of injury or illness; and its restitution to the maximum extent possible. However, in the medico-legal context the role of the medical expert is quite different. He is seeing the “patient” in order to evaluate the effect that injury has caused and to provide a prognosis which will allow the court to come to a decision about the magnitude of compensation. By the time most claims come to settlement therapeutic aspects are generally long past. The practical therapeutic approach of medicine therefore may lead to conflicts which should be perceived by the doctor.

In the assessment of any patient complaining of neurological

symptoms some general principles must be borne in mind. Neurological symptoms may be associated with objective abnormality demonstrable on examination. But the objective signs may be disproportionate, that is, they may be less than the symptoms would lead you to expect so that wilful or subconscious exaggeration is suspected. Or the signs may seem unrelated to the symptom, for example, a complaint of paralysis when the signs indicate sensory loss. Or finally the neurological symptoms may have no corresponding sign or abnormality on examination. A lack of objective support for the organic basis of a complaint is relatively common in neurology. It occurs, for example, in many pain syndromes, especially those where the pain is associated with damage to peripheral nerve, the spinal cord or central nervous system. Migraine, epilepsy, irritability and personality change are all common post-traumatic phenomena where there is usually no associated objective abnormality. Compensation gives a motive to perpetuate symptoms previously experienced or to claim symptoms that have either recovered or never been sufficiently severe to cause disability.

The doctor must be able to recognize patterns of symptomatology associated with organic disorder of the CNS and to be able to distinguish these from symptoms that are exaggerated or feigned. Where there are abnormalities demonstrable on examination the case may appear straightforward and convincing but there should be an “appropriateness” between history, present symptoms and objective abnormality.

Despite the large numbers of individuals affected, members of the general public often have little insight into the consequences of a neurological condition until they have direct personal experience [3]. Levels of awareness are low even about relatively common conditions such as epilepsy and head injury. Conditions that are less common, such as Friedreich’s ataxia, are largely unheard of and poorly understood by both the general public and health and social care professionals alike. Research commissioned to underpin the National Service Framework (NSF) for Long-term Conditions demonstrates the fear felt by patients who perceive that the professionals organizing and delivering their care have little understanding of their particular needs. Individuals with conditions affecting their ability to communicate are particularly vulnerable and often disadvantaged by the failure of staff to recognize the extent to which this problem affects care. Similarly, busy staff may wrongly interpret cognitive and behavioral problems and attribute any difficulties to personality defects, failure to adjust or obstinacy. These labels once acquired are often difficult to shake off, becoming accepted and perpetuated by other health professionals without further investigation or assessment. In this way the ignorance and attitudes of others can compound the difficulties people with neurological conditions experience, often causing them to feel stigmatized and misunderstood, which can, in turn, lead to further social, emotional and economic disadvantage.

Epilepsy

Epilepsy can be defined as a condition in which seizures

recur [1]. In general terms, seizures can be divided into two groups, generalized and focal. Simplistically, generalized epilepsies arise from the deeper structures of the brain, whereas focal epilepsies arise from the cortex.

The focal epilepsies (otherwise known as partial epilepsies) arise from differing areas of the cortex, and are thus defined by the area from which they arise, for example, frontal lobe seizures, temporal lobe seizures (previously known as psychomotor epilepsy and temporal lobe epilepsy), seizures of the parietal lobes and seizures of the the occipital lobes.

There are, in addition, a large group of syndromic epilepsies which predominantly occur in children, for example, Rolandic epilepsy, West’s Syndrome, Lennox Gastaut syndrome. The highest incidence of seizure activity occurs in the first few months of life and, by the age of 11, 50% of all people who will develop epilepsy will have done so. The incidence falls to approximately one in 200 throughout the teens to late 50s, and then the incidence rises again. The high incidence of risk in the first few months of life relates to metabolic factors affecting the infant brain. The later rise is attributable to the increased incidence of vascular disease in the ageing brain.

Approximately one in 60 people will have a seizure at some time in their life, whereas established epilepsy, having two or more seizures, has an incidence of approximately one in 200.

Epilepsy in Children

Seizures are common pediatric emergencies in both the prehospital environment and the emergency department [4]. Approximately 5% of all children have had one or more seizures by the age of 16. Epilepsy is a chronic condition of recurrent seizures that develops in only a small percentage of patients who have a single seizure. Most seizures in childhood are single, generalized, tonic-clonic events, lasting a few minutes. Seizures may be generalized or focal. Status epilepticus is defined as continuous seizure activity for 30 minutes or as recurrent seizures without intervening return of consciousness. Status epilepticus may be the first presentation of seizures in childhood.

The causes of seizures and status epilepticus in children are multiple and age-dependent. Children under age 3 years presenting with status epilepticus are most likely to have serious conditions, for example, CNS infections or vascular disorders, anoxia, trauma, intoxications, or metabolic abnormalities. Many of these conditions are treatable. In older children, however, status epilepticus is usually the result of chronic epilepsy with noncompliance for anticonvulsive medications, chronic progressive encephalopathy, or idiopathic encephalopathy. The likelihood of serious underlying disease in a child with status epilepticus is inversely proportional to age.

Diagnosis

Arriving at a diagnosis of epilepsy is relatively straightforward: when people suffer two or more seizures, they would be considered

to have epilepsy [5]. However, diagnosing the specific epilepsy syndrome is much more complex. The first step in the evaluation process is to obtain a very detailed history of the illness, not only from the patient but from the family as well. Since seizures can impair consciousness, the patient may not be able to recall the specifics of the attacks. In these cases, family or friends that have witnessed the episodes can fill in the gaps about the particulars of the seizure. The description of the behaviors during a seizure can go a long way to categorizing the type of seizure and help with the overall diagnosis. Moreover, in the initial visit with the physician, the entire history of the patient is obtained. In a child, this would include birth history, complications, if any, maternal history, and developmental milestones. At any age, so-called co-morbidities (other medical problems) are considered. Medications that have been taken or currently being prescribed are documented.

In the course of evaluating epilepsy, a number of tests are typically ordered. Usually, magnetic resonance image (MRI) of the brain is obtained. This is a scan that can help in finding many known causes of epilepsy such as tumors, strokes, trauma, and congenital malformations. However, while MRI can reveal incredible details of the brain, it cannot visualize the presence of abnormalities in the microscopic neuronal environment. Unlike the MRI scan, this can be considered a functional test of the brain. The EEG measures the electrical activity of the brain. Some seizure disorders or epilepsies have a characteristic EEG with particular abnormalities that can help in diagnosis. Other tests that are frequently ordered are various blood tests that are also ordered in many medical conditions. These blood tests help to screen for abnormalities that can be a factor in the cause of seizures. Occasionally, genetic testing is performed in those instances where a known genetic cause is suspected and can be tested. A major concern in the course of an evaluation of epilepsy is to identify the presence of life-threatening causes such as brain tumors, infections, and cerebrovascular disease. Also, an accurate diagnosis can expedite the most effective treatment plan.

Treatment

The association between intellectual disability (ID) and epilepsy is well known [6]. Studies have shown higher prevalence rates both in institutions and in the community and commented on the profound effect it has on individuals and their families. Nervous system malformations (including brain malformation) and hydrocephalus are often associated with ID. Many people with ID, especially of a more severe degree, also have neurological impairments.

Epilepsy and its treatment can have a profound effect on individuals with ID. This impact on physical health, psychological health and mortality has, in turn, a further impact on the families and careers for these individuals. A major systematic review on pharmacological interventions for epilepsy in people with ID, assessing data from randomized controlled trials, confirmed that in the majority of cases where antiepileptic drugs were trialed moderate reduction in seizure frequency and occasional seizure freedom were obtained. Antiepileptic drugs proven effective in

the general population were also effective in refractory epilepsy in people with ID. Side effects seem to be the same as in the general population and behavioral side effects leading to discontinuation of treatment were rare.

A systematic review of non-pharmacological interventions for epilepsy in people with ID found no randomized controlled studies in this population, highlighting the need for well-designed randomized controlled trials in this area. Interventions studied in populations without ID include relaxation, behavior therapy, hypnosis, acupuncture, biofeedback, seizure alert dogs and aroma therapy, with varying results.

Treatment of people with life-long generalized seizures has a high rate of success; treatment for partial seizures arising in the context of a neurological condition is much less successful [7,8]. In addition, metabolic changes or drug treatment in the later stages of care can precipitate seizures. Clinicians should maintain a heightened index of suspicion that seizures might occur in cerebral tumor, following trauma or in conditions such as liver failure, uremia, hypoglycemia, hyperthyroid or hypo parathyroid states, all of which may lower the threshold at which a seizure occurs. The administration or withdrawal of drugs (e.g. alcohol, barbiturates) also may increase the risk of seizure. Repeated use of meperidine (pethidine) in chronic pain, can lead to an accumulation of nor-meperidine and induction of seizures.

Deaths from Epilepsy

Epilepsy-recurrent unprovoked seizures associated with an increased risk of mortality and, while there may be specific reasons why a person with epilepsy may die (e.g. drowning as a result of a seizure while swimming), there are approximately 500 sudden and unexpected deaths in epileptics each year in the UK where the precise cause of death is not identified [9]. Such deaths have been classified as Sudden Unexpected Deaths in Epilepsy (SUDEP), defined as a 'sudden unexpected, witnessed or unwitnessed, non-traumatic and non-drowning death in epilepsy, with or without evidence of a seizure, and excluding documented status epilepticus, where post-mortem examination does not reveal a toxicological or anatomic cause of death'.

The mechanism of death in such cases is uncertain, but may be related to a seizure-induced arrhythmia, seizure-mediated inhibition of respiratory centers or a complication of anti-epileptic treatment. Post-mortem findings in SUDEP are nonspecific (for example pulmonary oedema and congestion) and the utility of the presence of a tongue injury in diagnosing a seizure is controversial [10].

Neuropathological examination of the brain is important in order to exclude the presence of a lesion capable of providing an explanation for seizure activity, such as, for example, an old brain injury or arteriovenous malformation, although the presence of more subtle changes in the brain, thought to represent evidence of seizure activity, cannot be taken as evidence of seizure activity at the time of death.

Even well-controlled epileptic patients may die rapidly and inexplicably; it was once thought that they must have been exhausted from status epilepticus, but this is now not thought to be so. There are some who doubt that these patients are even having a fit when they die because of the lack of pathological features, but many epileptics have fits that leave no pathological signs, rendering this theory unlikely. Epileptics are also at risk from the hazards of all types of accidents during a pre-fit aura (if they have one), while having a fit or immediately afterwards; these hazards include falls, drowning, suffocation and postural asphyxia.

Conclusion

Causes of epilepsy can be numerous disorders of the central nervous system. In childhood, by frequency, the most common causes of occurrence is childbirth or neonatal trauma, followed by vascular development disorders, head injury, infection or tumors. In adulthood, epilepsy can cause stroke, head injury, intoxications or excessive consumption of alcohol and/or drugs, tumors and infections.

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