Nursing Management of EPILEPSY

Rita Beck Black
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AN ASPEN PUBLICATION

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AN ASPEN PUBLICATION®
Aspen Systems Corporation
Rockville, Maryland
London
1982

Library of Congress Cataloging in Publication Data

Main entry under title:

Nursing management of epilepsy.

Includes bibliographies and index.
1. Epilepsy—Nursing.
I. Black, Rita Beck. II. Hermann, Bruce P.
III. Shope, Jean Thatcher.
[DNLM: 1. Epilepsy—Nursing. WY 160 N9763]
RC372.N87 616.8'5306 81-20524
ISBN: 0-89443-652-X AACR2

Library of Congress Catalog Card Number: 81-20524
ISBN: 0-89443-652-X

Printed in the United States of America

1 2 3 4 5

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Preface

The onset of epilepsy marks an event of great significance for affected individuals and their families. Complex diagnostic procedures may be needed to determine the etiology of the seizures; numerous anticonvulsant medications may be tried before optimum seizure control is obtained; social rejection may be experienced from teachers, employers, friends, and even relatives; and long-term adjustments may be faced in such widely different areas as dental care, family planning, and career goals. The importance of a comprehensive approach to services for individuals with epilepsy offers a clear mandate to professionals concerned about the improvement of health care services. The nursing profession in particular is in a unique position to offer the leadership necessary to bring together the medical, psychological, and social services needed for comprehensive management of epilepsy.

Nursing Management of Epilepsy grew out of the editors' own involvement in providing clinical services in comprehensive epilepsy programs and in conducting workshops for nurses about epilepsy management. The enthusiastic response shown by nurses in our training programs served to underscore our own observations of the critical role that the nursing profession can play in services to patients with epilepsy. This volume is intended for use as a practical reference work for nurses involved in the diverse settings such as schools, pediatric clinics, neurology services, dental programs, and public health programs where individuals with epilepsy may be encountered. The list of possible settings is almost endless because epilepsy is a chronic disorder affecting both children and adults throughout the population. It is also our hope that this book will prove useful for teaching purposes in neurological nursing courses in graduate and continuing education programs.

The authors of the eleven chapters have been drawn from a variety of professional disciplines that can contribute to a comprehensive approach to epilepsy. Basic information is provided on the nature of epilepsy, seizure types, acute and

long-term management of seizures, anticonvulsant medications, and psychosocial aspects of epilepsy. More specialized attention is given to such specific topics as dental care, genetic counseling, behavioral correlates of epilepsy, and special problems that the child with epilepsy may encounter in the school setting. No single chapter should be seen as standing alone, however. The overriding concern throughout this book is the importance of a truly integrated approach to services, one that takes into consideration the equally important areas of medical, psychological, and social concerns.

Rita Beck Black
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January 1982

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Chapter 1

Medical Aspects of Epilepsy: An Overview

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Throughout history epilepsy has been greatly misunderstood and feared as a vague disorder surrounded by mystery. The word *epilepsy* comes from a Greek word meaning "a taking hold of or seizing." The word has become a negative label, with many associated problems ranging from medical imprecision to social stigma.

Epilepsy is a relatively common neurological disorder. It is estimated that 10 of every 1,000 people have epilepsy and that 6 of the 10 are under treatment.[1] In addition, febrile seizures are experienced by two to four percent of all children.[1]

Because of the nature of epilepsy, the patients and their families who are affected by it are faced with many difficulties. Heavy expenses, handicapping effects, frustrations with treatment, and other associated problems are but a few of the difficulties. Perhaps the most difficult problems arise for patients when expert medical knowledge and comprehensive treatment are unavailable or when patients do not know how to seek appropriate and effective care.

It is therefore important that nurses update their knowledge of epilepsy so that with proper understanding and appropriate diagnosis and treatment, patients with epilepsy will be able to benefit from medical advances and lead lives of their own choosing.

The following sections of this chapter will include a discussion of the terms used when defining seizures and a detailed description of the types of seizures and their clinical manifestations, causes, diagnosis, and treatment. Other chapters in this volume deal in more depth with specific aspects of a comprehensive approach to the medical management of epilepsy.

DEFINITIONS

J. Hughlings Jackson proposed in 1890 that a *seizure* "is a sudden excessive and rapid discharge of grey matter of some part of the brain" and that "according to the

seat of the discharging lesion, the symptoms of the paroxysms vary."[2] A person who has epilepsy, a central nervous system disorder, has a tendency for recurrent seizures, transient uncontrolled episodes of abnormal behavior (mental function and/or body movements) associated with abnormal electrical discharging of populations of brain cells. The observable seizure that occurs is not a disease itself, but it is a symptom of the underlying disorder. As Jackson suggested, the symptoms of the seizures vary according to what part of the brain is affected.

There are several stages of a seizure, and each stage has observable or experienced symptomatology as well as particular concurrent electrical brain activity. Often, however, the only stage of which patients and observers are aware is the seizure itself. Patients taking anticonvulsant medication may have less obvious stages. The symptoms and associated electrical brain activity vary according to the seizure types described in the next section. Some patients experience a *prodrome* or gradual buildup of change in emotions, behavior, or alertness for several hours or days before a seizure. Certain areas of the brain during this time may be losing efficiency, and normal electrical function may be somewhat reduced.

An *aura,* or warning, is actually the beginning of a seizure and may be a motor or sensory experience, depending on the part of the brain where the abnormal electrical seizure activity is beginning. Not all patients are able to describe this seizure stage even if they experience it.

If the electrical activity continues or spreads, the seizure attack, or *ictus,* occurs. This is the most obvious part of the seizure, in which the patient exhibits some degree of disturbed consciousness and/or stiffening, jerking, falling, or purposeless movements called *automatisms*. The degree of disturbed consciousness and the parts of the body involved reflect where in the brain the electrical activity is occurring and how it is spreading.

The *postictal,* or recovery, period may vary in length and type among individual patients. Some patients regain normal function quickly, while others may be confused, irritable, or in a deep sleep. During this period the electrical and chemical activity in the brain is regaining its normal balance by the use of excessive inhibiting forces that control the abnormal discharges.

SEIZURE TYPES

It is essential that the type of seizure be correctly identified so that the proper diagnosis can be made and appropriate therapy can be selected. Careful observation of seizures and a detailed history taken from the patient and anyone who has observed the seizure will be of great benefit in properly classifying the seizures according to the descriptive classification outlined in Exhibit 1-1.[3] Essential facts to be obtained include where and how the seizure started.

Exhibit 1-1 International Classification of Epileptic Seizures

I. Partial seizures (seizures beginning locally)

A. Partial seizures with elementary symptomatology (generally without impairment of consciousness)

1. With motor symptoms (includes Jacksonian seizures)
2. With special sensory or somatosensory symptoms
3. With autonomic symptoms
4. Compound forms

B. Partial seizures with complex symptomatology (generally with impairment of consciousness) (temporal lobe or psychomotor seizures)

1. With impairment of consciousness only
2. With cognitive symptomatology
3. With affective symptomatology
4. With "psychosensory" symptomatology
5. With "psychomotor" symptomatology (automatisms)
6. Compound forms

C. Partial seizures secondarily generalized

II. Generalized seizures (bilaterally symmetrical and without local onset)

A. Absences (petit mal)
B. Bilateral massive epileptic myoclonus
C. Infantile spasms
D. Clonic seizures
E. Tonic seizures
F. Tonic-clonic seizures (grand mal)
G. Atonic seizures
H. Akinetic seizures

III. Unilateral seizures (or predominantly)

IV. Unclassified epileptic seizures (due to incomplete data)

Source: Abstracted from Gastaut H: Clinical and electroencephalographical classification of epileptic seizures. Courtesy of *Epilepsia* 11:102-113, 1970.

The classification has two major components: (1) partial seizures, which begin in a specific part of the brain and usually start with symptoms limited to a local part of the body or a single function, and (2) generalized seizures, which begin in the whole brain at once and involve all the body and its function in the seizure.

Partial Seizures

A partial, or focal, seizure may begin with an aura, the first symptoms of seizure activity in a particular focus in the brain. Seizure activity starts locally and frequently spreads progressively, involving more of the brain and more body functions. It is important to seek evidence of a focal onset even though the attack may appear to be generalized. Partial seizures are subdivided into elementary (simple) types, which do not involve impaired consciousness, and complex types, in which consciousness is impaired. Partial seizures, both elementary and complex, may occur in compound forms or in combinations of the various symptoms. Partial seizures may also spread to become generalized seizures, but their focal beginning is important for proper diagnosis and appropriate therapy.

Partial Seizures (Elementary) with Motor Symptoms

Seizures in this category are characterized by clonic or tonic movements that occur in one extremity or on one side of the face, depending on the site of origin in the motor strip of the brain. Because the hand and mouth occupy a large area of the motor strip, the seizure often starts in the thumb and mouth. Focal seizures are commonly characterized by adversive movements, such as the turning of eyes and/or head away from the side of the brain where the focus is located.[4] When a seizure starts focally and sequentially involves body parts, it is called a Jacksonian seizure.

The seizure may remain focal or may proceed to subcortical areas and become secondarily generalized with loss of consciousness. Following a focal seizure, there may be a temporary paralysis (Todd's paralysis) of the involved body part. The paralysis may last minutes or hours but does not exceed 24 hours. In adults, but not in children, the presence of Todd's paralysis is indicative of a structural lesion.[5-7]

Partial Seizures (Elementary) with Somatosensory Symptoms

The initial seizure symptoms in sensory seizures may range from vague to specific sensations such as warmth or numbness that, while possibly unpleasant, usually are not painful. The seizure focus is in the parietal lobe. In special sensory seizures, the senses of sight,[8] hearing, smell, or taste may be affected by seizure activity in the occipital or temporal lobes. A feeling of dizziness may also be reported.[9]

Partial Seizures (Elementary) with Autonomic Symptoms

Patients having autonomic symptoms may exhibit sweating, palpitations, pupillary dilation, pallor or flushing, salivation, gastrointestinal symptoms of nausea, or increased borborygmi (rumbling noises caused by gas propelled through the intestines). Symptoms that affect the autonomic nervous system come from deep brain cortex areas and the upper part of the brain stem.

Partial Seizures (Complex) with Impaired Consciousness Only

All the partial complex seizures are associated with impaired consciousness and amnesia for the event. Some seizures occur, however, with only the altered consciousness and not the cognitive, affective psychomotor or psychosensory symptoms described in the following sections.[10] This type of complex partial seizure can be distinguished from petit mal in that it is more prolonged, there is postictal confusion, and the electroencephalogram (EEG) does not show a primary three per second spike and wave pattern.

Partial Seizures (Complex) with Cognitive Symptoms

Some partial complex symptoms are primarily disturbances in thought or memory. Thinking may be forced, with thoughts rushing through the mind. Familiar situations may seem new (jamais vu), or new situations may seem familiar (déjà vu). Dreamy states with memory flashbacks may occur. These seizure symptoms, as well as the affective symptoms below, arise from the limbic system of the brain, under portions of the frontal lobes and anterior and medial sections of the temporal lobes.[11]

Partial Seizures (Complex) with Affective Symptoms

Brief episodes of emotions and/or behavior unrelated to the patient's environment are typical of affective partial complex seizures. Sensations of pleasure, displeasure, fear, intense depression, or anxiety may occur. Gelastic seizures are those in which loud, hollow, meaningless laughter is observed.[12, 13]

Partial Seizures (Complex) with Psychomotor Symptoms

Partial complex seizures in this category have also been called psychomotor or temporal lobe seizures and are typical of one of the most common types of seizure disorders. These seizures frequently begin with an aura and last one to two minutes. Patients commonly exhibit *automatisms* (repetitive, purposeless behavior), such as picking at clothes, scratching, chewing, or lip smacking. Patients may stare blankly, are not responsive to verbal stimuli, and are unaware of their environment. There is mild to moderate postictal confusion and amnesia for the seizure event itself.

The EEG during the ictus may show spikes, sharp waves and rhythmic slowing, suppression, or rhythmic temporal waves. In 10 to 30 percent of cases, no changes may be seen. Interictally the EEG may be normal or may show localized spikes, sharp waves, spike and slow wave activity, or slow waves.[14]

Partial Seizures (Complex) with Psychosensory Symptoms

Less common than psychomotor symptoms, psychosensory seizure symptoms are experienced by some patients. These seizures consist of peculiar sensations, such as hallucinations, illusions, unpleasant smells or tastes, or dizziness.

Generalized Seizures

Generalized seizures begin with the entire body, and all body functions are affected at once. There is rarely an aura, for such a warning would imply a focus and thus the seizure would be more correctly classified as a partial seizure secondarily generalized. Patients who are standing when the seizure begins will fall, except in the case of absence seizures. Other characteristics of generalized seizures might include abnormal movements, no movement, loss of muscle tone, or staring. There is marked impairment of consciousness during all types of generalized attacks, but postictal symptoms vary. The electrical seizure activity arises from beneath the cortex, in deep centers of the brain. EEG patterns are bilaterally synchronous and symmetrical.

Absence Seizures

Absence seizures, formerly referred to as petit mal seizures, are one of the most common types of seizure disorders and occur primarily in children. Classically, onset of seizures is between 4 and 13 years of age.[15, 16] These seizures do not have an aura but rather consist of a brief lapse of consciousness, associated with staring, eye fluttering, and sometimes twitching of the mouth or hands. Patients do not fall or exhibit other movements. The episode usually lasts 10 to 30 seconds, after which the patient resumes the preseizure activity. The seizure may go unnoticed even though the frequency of seizures can range from several per day to as many as 200 per day. Teachers may complain that a child is daydreaming, and frequent seizures may be responsible for subtle learning disorders.

The EEG shows a bilateral synchronous symmetrical 3 to 3.5 per second spike and wave pattern. Interictally the EEG shows normal background, and occasionally polyspike and wave patterns. The seizure and EEG changes can be precipitated by hyperventilation for three minutes.

A few patients exhibit a more complicated or atypical absence attack. They display the more typical symptoms but also may have a brief warning, some confusion after the attack, and some automatisms. Their lapse of consciousness may be incomplete, and the attacks may occur in clusters.

Myoclonic Seizures

Myoclonic seizures are sudden, brief, involuntary movements or jerks of the trunk and extremities. They occur without warning and if severe enough may cause the patient to fall to the ground. Most people experience similar myoclonic jerks normally while falling asleep. Myoclonic seizures should be differentiated from infantile spasms. [17,18]

Infantile Spasms

Infantile spasms are myoclonic seizures that commonly occur between three and eight months of age and are more frequent in males.[19] These seizures are unfortunately associated with marked slowing of intellectual and motor development and should be treated early and aggressively.[20,21]

The seizure begins abruptly, with the infant sometimes giving the parent a warning, such as a cry or color change, and then exhibiting a flexion spasm involving only head nodding or doubling up of the entire body. These attacks last no more than a few seconds and may occur in clusters. The speed and posture of the attacks have given rise to other names such as salaam attacks, jackknife seizures, or lightning seizures.

The EEG shows a very characteristic pattern called *hypsarrhythmia*.[22,23] It shows high voltage slow waves and multifocal spikes. As the child grows, the seizures become myoclonic in nature and the EEG changes to multiple spike foci, single foci spike, and 2 to 2.5 per second spike and wave complexes.[23]

Clonic Seizures

Rhythmic repeated jerking movements typify clonic seizures, which usually occur in combination with tonic stiffening in the tonic-clonic seizure described below.

Tonic Seizures

Rigidity of the extremities or arching of the back typify tonic seizures. This stiffening may occur alone, especially in some children, or it may occur in combination with clonic jerking, as in the tonic-clonic seizure described below.

Tonic-Clonic Seizures

Tonic-clonic seizures, formerly referred to as grand mal seizures, are one of the most common seizure disorders, although they occur in children less frequently than previously thought.[24,25] The seizure may begin with a cry or yell, which is caused by the tightening chest muscles pushing air past the vocal chords. The patient abruptly and completely loses consciousness and falls to the ground. In the