

The differential diagnosis of epilepsy, pseudoseizures, dissociative identity disorder, and dissociative disorder not otherwise specified

Elizabeth S. Bowman, MD
Philip M. Coons, MD

The authors review the co-occurrences of dissociative symptoms and disorders with epilepsy and pseudoseizures and examine newer diagnostic instruments that assist in accurate diagnosis of persons with concomitant seizure behaviors and dissociative symptoms. They also review seizure behaviors and electroencephalographic findings in persons with dissociative identity disorder (DID) and dissociative disorder not otherwise specified (DDNOS) and dissociative symptoms in persons with epilepsy and with pseudoseizures. Dissociative symptoms in 15 patients with epilepsy and 15 with pseudoseizures were examined using the Dissociative Experiences Scale (DES) and the Structured Clinical Interview for DSM-IV Dissociative Disorders (SCID-D). On the SCID-D, pseudoseizure patients had significantly higher dissociative symptom scores than epileptic patients, but DES scores did not reliably distinguish epileptic and pseudoseizure patients. Misdiagnosis of persons with seizures and dissociative symptoms can be avoided by careful adherence to DSM dissociative disorder criteria, the use of video-EEG monitoring, and systematic assessment of dissociative symptoms with the SCID-D. (Bulletin of the Menninger Clinic, 64[2], 164–180)

The clinical conditions of dissociative identity disorder (DID; formerly multiple personality disorder), dissociative disorder not otherwise specified (DDNOS), epilepsy, and pseudoepilepsy (also called pseudoseizures or nonepileptic seizures) share a number of common

The authors thank Mr. Kuolung Hu for statistical analysis.

Dr. Bowman is associate professor of psychiatry at Indiana University School of Medicine, Indianapolis. Dr. Coons is professor of psychiatry at Indiana University School of Medicine. Correspondence may be sent to Dr. Bowman at the Department of Psychiatry, 541 North Clinical Drive, Room 291, Indianapolis, IN 46202. E-mail: ebowman@iupui.edu. (Copyright © 2000 The Menninger Foundation)

dissociative symptoms that include amnesia, fugue, depersonalization, derealization, and identity change. In addition, some individuals with dissociative identity disorder (DID) also suffer from epilepsy and/or pseudoseizures. These overlapping symptoms and concurrent diagnoses can create great diagnostic difficulties in sorting out dissociative symptoms in persons with seizures. This article offers help to the clinician faced with this challenge.

We will begin with diagnostic criteria and procedures, and then review the co-occurrences of dissociative symptoms and disorders with epilepsy and pseudoseizures. Finally, we will discuss data from newer screening and diagnostic instruments that can assist in accurate diagnosis of persons with concomitant seizure behaviors and dissociative symptoms.

Diagnostic issues and descriptions of DID, DDNOS, epilepsy, and pseudoseizures

Pseudoseizures and epilepsy

Pseudoseizures (also called nonepileptic seizures) are paroxysmal changes in behavior that resemble epileptic seizures but are without organic cause and are not accompanied by the ictal, peri-ictal and interictal electroencephalogram (EEG) changes (spikes and slowing) that characterize epilepsy. Pseudoseizure symptoms include unresponsive staring, minor motor movements, bizarre behavior, and generalized movements. They are psychological in origin and are associated with a wide variety of psychiatric diagnoses (Bowman & Markand, 1996). In this article, "seizure" will refer to the preceding clinical manifestations, regardless of whether they are due to epilepsy or pseudoseizures. The term "epileptic seizures" will be reserved for recurring seizure symptoms whose etiology is abnormal discharges on an EEG.

Video-EEG monitoring

Simultaneous video and EEG recording is the gold standard of pseudoseizure and epilepsy diagnosis. Indeed, it was the advent of this monitoring that raised awareness of the frequency of pseudoseizures and their overlap with epilepsy and dissociative symptoms. Abnormal electrical discharges (such as spikes) are suggestive of epilepsy but can be present in persons who have only pseudoseizures or who have both pseudoseizures and epilepsy. Thus a conclusive diagnosis of pseudoseizures requires recording during a seizure. Pseudoseizures are diagnosed when the EEG manifests waking alpha rhythm or fails to change before, during, or after a clinical event involving alteration of consciousness or bilateral motor/sensory phenomena. For instance, dissociative trances, which may be mistaken for absence epilepsy, are

not associated with EEG disturbances, thus distinguishing them from absence epileptic seizures. Unfortunately, the changes of frontal lobe epilepsy can be undetectable with surface EEGs, whose accuracy during ictal events is only 44% (Wyler, Richey, & Hermann, 1989), so additional clinical criteria are usually considered when diagnosing pseudoseizures from video-EEG recordings (Kanner et al., 1990).

To capture a seizure, prolonged (4-hour to 3-day) sessions may be employed and a variety of suggestive and physiological techniques may be used to provoke epileptic or nonepileptic seizures. This makes video-EEG testing quite expensive, so clinicians need preliminary screening mechanisms to help them decide when to use it. The advent of video-EEG monitoring has greatly improved accurate diagnosis of pseudoseizures and demonstrated the impossibility of accurately distinguishing epilepsy from pseudoseizures by mere seizure observation.

DID and DDNOS

Of the four dissociative disorder diagnoses in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM-IV*; American Psychiatric Association, 1994), DID and DDNOS generally involve the greatest quantity and diversity of dissociative symptoms. Accordingly, they are most likely to be considered when dissociative symptoms occur in seizure patients. In *DSM-IV*, a diagnosis of DID requires amnesia for important personal information as well as recurrent and consistent alterations of identity. Dissociative symptoms due to epilepsy or other biological causes do not qualify as contributing to these diagnoses. The identity changes associated with epilepsy tend to be transient and to cluster in the peri-ictal period. They almost never involve the more elaborate and enduring sense of personal identity (such as endorsing different names and ages) seen in the personality states of DID.

DDNOS is a diagnosis used for persons with considerable dissociative symptoms that do not fulfill the criteria for dissociative amnesia, dissociative fugue, depersonalization disorder, or DID. DDNOS is the diagnosis used for persons who recurrently enter dissociative trances, who have dissociated ego states (identity alterations that fall short of fully developed personality states), or who have a clinically significant combination of nonorganic depersonalization, derealization, amnesia, or identity alteration.

Literature review: Overlapping dissociative and seizure symptoms

Electroencephalographic changes and seizures in DID

In individual case reports of patients with DID, EEGs have been reported as normal (Bliss, 1980; Cocores, Bender, & McBride, 1984; Coryell, 1983; Larmore, Ludwig, & Cain, 1977; Lipton, 1943; Lud-

wig, Brandsma, Wilbur, Bendfeldt, & Jameson, 1972; Salama, 1980; Thigpen & Cleckley, 1954) and as abnormal (Braun, 1983; Brende & Rinsley, 1981; Coons, Milstein, & Marley, 1982; Cutler & Reed, 1975; Drake, 1986; Flor-Henry, Tomer, Kumpula, & Yeudall, 1990; Horton & Miller, 1972; Pohl, 1977; Rosenstein, 1994). Although Putnam, Guroff, Silberman, Barban, and Post (1986) did not report on EEGs in DID, they did report that in a group of 100 patients with DID, 11% reported seizurelike episodes, 8% were previously diagnosed with complex partial seizures (CPS), and 6% were previously diagnosed with grand mal epilepsy. In a subsequent study, Coons, Bowman, and Milstein (1988) reported on EEGs in 30 of a series of 50 patients with DID. Seventeen EEGs were normal and six showed medication effects. Of the remaining seven abnormal EEGs, five showed spiking and paroxysmal activity. Three of these 50 individuals had a history of grand mal epilepsy, two had a history of complex partial seizures (CPS), and 14% had a history of pseudoseizures.

Ross, Heber, Norton, and Anderson (1989) found that 2 of 20 patients (10%) with DID exhibited nonorganic seizures. Bowman (1996) found normal EEGs in six of seven DID patients who presented with pseudoseizures. The other subject had mild left temporal slowing.

EEG changes among different personality states in DID have been reported ever since Thigpen and Cleckley (1954) found differences in alpha frequencies between two of the alter personalities of the famous case of Eve. Morselli (1953) reported similar EEG differences in a person with DID. Ludwig et al. (1972) found differences in visual evoked responses, muscle tension, and alpha frequency and amplitude among four personality states in a man with DID, suggesting that the different emotional states contributed to these differences. In a woman with four alter personalities Larmore et al. (1977) found similar differences in EEG and visual evoked responses. In the first controlled study of EEGs in DID, Coons et al. (1982) found differences in amplitude at several different frequencies among alter personalities in two patients with DID. The normal control, however, experienced even more differences among simulated personality states, leading the investigators to postulate that the differences could be accounted for by intensity of concentration, mood changes, muscle tension, and other factors.

Cocker, Edwards, Anderson, and Meares (1994) performed EEG studies on two female DID patients in each of two personality states before, during, and after hypnosis. EEG changes in one patient reflected changes similar to those previously reported for subjects under hypnosis. In the other patient, there was increased frontal delta activity in a baby alter personality. Because delta activity is associated with children and is not usually observed in adults, the investigators concluded that

some other unspecified electrophysiological process was occurring in this patient.

Using neuropsychological testing, Flor-Henry et al. (1990) reported bifrontal and left temporal dysfunction in two DID patients. On EEG, these patients showed relative left hemisphere activation, leading the authors to conclude that a neurophysiological model could account for their findings.

EEG brain mapping has been performed in at least two published studies of patients with DID. Putnam (1982) studied 10 patients with DID and 10 DID-simulating controls with visual evoked potentials. The evoked potentials (EPs) for different personality states in the DID patients were strikingly different from one another, compared with the controls who had nearly identical EPs. This led Putnam to conclude that the changes in personality states in DID patients represented actual changes in personality accompanied by significant changes in brain activity. Hughes, Kuhlman, Fichtner, and Gruenfeld (1990) found that mapped EEGs of 10 alter personalities in a single case of DID were distinctly different among the personality states. An electroencephalographer blind to the states reviewed the maps and categorized them according to electrical similarities. These categorizations corresponded nearly exactly to the therapist's categorizations of the alter personalities according to their characterological characteristics.

To summarize the electroencephalographic findings in patients with DID, it appears that a minority (around 10%) experience epilepsy and around 25% experience some type of seizure. Although there are visually read EEG differences among personality states in patients with DID, these differences probably reflect differences in mood, mental alertness, and muscle tension among personality states. However, the use of more sophisticated brain electrical mapping has revealed distinct differences among personality states that probably represent actual changes in personality accompanied by significant changes in brain activity. Evidence does not support epileptiform activity as a cause of DID.

Electroencephalographic changes and seizures in DDNOS

Schenck, Milner, Hurwitz, Bundlie, and Mahowald (1989) reported on 100 consecutive adults evaluated at a sleep disorders laboratory for repeated nocturnal injury. Seven patients had dissociative disorders. Although videorecording revealed aggressive behavior and injury in these patients, their EEG activity revealed normal waking patterns.

Saxe et al. (1994) studied 14 patients who met *DSM-III* (American Psychiatric Association, 1980) criteria for dissociative disorders, 8 of whom had DDNOS. Fourteen percent had a history of nonorganic seizures. Bowman (1996) found abnormal EEGs in 9 (32%) of 28

DDNOS patients who had presented with pseudoseizures. Five of the EEGs had sharp or spike waves. Three subjects had been diagnosed with epilepsy, but only one of these three had spike waves on EEG.

In the only comprehensive study of DDNOS, Coons (1992) studied 50 DDNOS patients whose dissociative symptoms included amnesia (96%), alternate ego states (52%), fugue (44%), and depersonalization (70%). Thirty individuals had EEGs, 22 of which were normal. Four EEGs showed medication effects, two were mildly abnormal, and two showed spike and slow wave activity. None of the 50 subjects had a clinical history of epilepsy or abnormal neurological findings. Thus one third or less of DDNOS patients have abnormal EEGs, but the incidence of epilepsy in these patients is poorly studied.

Dissociative symptoms in patients diagnosed with epilepsy

Symptoms typical for dissociative disorders may occur during epileptic attacks. Such ictal and peri-ictal symptoms include amnesia, fugue, depersonalization, derealization, and changes in identity (Ackner, 1954; Mesulam, 1981; Perrine & Congett, 1994; Schenk & Bear, 1981).

Mesulam (1981) reported an association of dissociative states with abnormal temporal lobe EEGs. However, of the seven cases that he diagnosed as DID, only three fit the *DSM-III* criteria for this condition. Amnesia was lacking in the other four patients, eliminating DID as a diagnostic possibility. In five other cases, he diagnosed possession, but only the first appeared to be dissociative in nature.

In a similar study, Schenk and Bear (1981) reported an association of DID with CPS. Of the seven cases they reported, three appeared to have DID. Of the four remaining patients, none experienced amnesia and therefore they did not meet *DSM-IV* criteria for DID. Although these four individuals described alter personalities or demons that were responsible for ego-alien behavior, alter personality states had not been observed.

Drake (1986) reported on 15 patients diagnosed with DID and epilepsy, including 5 patients with CPS who reported postictal personality states differing from their usual personality state. Of the 10 remaining patients, 6 had DID and normal EEGs. Three of these patients exhibited pseudoseizures. EEGs were abnormal (right temporal slowing and generalized theta) in the remaining 4 DID patients. In a series of 15 epileptic patients, Bowman (1996) found that one had psychogenic amnesia and another had DDNOS with evidence of separate ego states. These symptoms appeared related to child abuse but independent of the occurrence of seizures.

Several studies have attempted to differentiate DID from CPS. Loewenstein and Putnam (1988) administered the Dissociative Experi-

ences Scale (DES; Bernstein & Putnam, 1986) to 12 males with CPS, 9 males with DID, and 39 males with PTSD. The median score for the CPS subjects was 6.8 (essentially normal). When statistically compared to the scores of multiple personality disorder (MPD) and posttraumatic stress disorder (PTSD) subjects, there were significant differences, which led the investigators to conclude that there are few data to support a relationship between MPD and epilepsy. Ross et al. (1989) administered the DES and the Dissociative Disorders Interview Schedule to 20 patients with MPD, 20 patients with CPS, and 28 neurological controls. The mean DES score for the CPS subjects was 6.7 (essentially normal). The MPD subjects differed from both the CPS subjects and the controls on a wide range of symptoms, leading these investigators to conclude that the etiologies for MPD and epilepsy were different.

There have been a number of reports of individuals with well-documented epilepsy who exhibit peri-ictal personality changes. Benson, Miller, and Signer (1986) reported on two individuals with generalized and complex partial seizures. Both would become aggressive, insist that they had another identity, and not recognize their families prior to their seizures. After their seizures, they would resume their normal personality states. Ahern et al. (1993) reported on two patients with CPS who exhibited postictal personality changes that resolved over a few hours. Neither had the more complex and enduring personality alterations present in DID.

Organic fugue states may occur in epilepsy. Ackner (1954) reported that fugues occurred in 78% of patients with CPS during both ictal and postictal periods. During these episodes, which were associated with complex stereotypical behavior and lasted anywhere from a few minutes to a few hours, these individuals wandered and appeared perplexed.

In summary, studies of dissociative symptoms in persons diagnosed with epilepsy show that organic fugues are common but overall levels of dissociative symptoms generally do not exceed population norms. When postictal personality changes occur, they tend to be short-lived and do not involve elaborate identity changes, but they do result in mistaken diagnoses of DID. Epilepsy and DID co-occur, but evidence does not support an etiological relationship between them. Careful study of persons with epilepsy and dissociative disorder diagnoses reveals the misdiagnosis of pseudoseizures as epilepsy and the misdiagnosis of organic dissociative symptoms as dissociative disorders.

Dissociative symptoms in pseudoseizure patients

Unlike studies that found little relationship between dissociative disorders and epilepsy, recent studies of pseudoseizures have found considerable overlap with dissociative symptoms, reviving Pierre Janet's

century-old proposal that dissociation is the mechanism for such conversion symptoms. Modern authors are proposing that conversion and dissociation are intimately connected in a somatic-dissociative spectrum of expressing distress (Betts & Boden, 1992; Bowman, 1993; Bowman & Markand, 1996; Kuyk, Van Dyck, & Spinhoven, 1996; Nash, 1993; Nemiah, 1991).

Is there evidence for a dissociative mechanism for pseudoseizures? Pseudoseizure patients have elevated DES scores, compared to normals and epileptics (Arnold & Privitera, 1996; Bowman, 1993; Bowman & Markand, 1996), but Litwin, Walker, and Laxer (1992) found that measures of dissociation alone were inadequate to prospectively separate persons with pseudoseizure from those with epilepsy. Torem (1993) described four patients whose pseudoseizures were simply the presenting symptom of dissociative disorders. Treatment of the dissociative disorder led to marked reduction of seizures. Ramchandani and Schindler (1993) found dissociative disorders (depersonalization disorder and DDNOS) in four of four patients with pseudoseizures resembling CPS but in none of seven patients with pseudoseizures of a generalized type. Alper (1994) observed that the staring and unresponsiveness of dissociative states may resemble CPS, causing dissociative disorders to be misdiagnosed as epilepsy.

The largest studies of dissociation in pseudoseizure patients is Bowman and Markand's (1996) study of 45 patients that systematically assessed current and lifetime dissociative symptoms and disorders with a valid diagnostic interview. It found a 91% occurrence of current *DSM-IV* dissociative disorders (DDNOS, 62%; DID, 16%; psychogenic amnesia, 13%). The lifetime occurrence of dissociative symptoms in these pseudoseizure subjects was frequent: fugue states, 36%; derealization, 56%; depersonalization, 87%; amnesia for childhood, 73%; and adulthood amnesia outside of seizures, 82%. In 44% of patients, episodes of amnesia occurred during the interviews. The authors concluded that the symptom patterns, demographics, and frequent abuse experiences of dissociative disorder and pseudoseizure patients resemble each other (Carlson & Putnam, 1993).

In summary, pseudoseizure patients have high rates of dissociative symptoms and dissociative disorders, leading authors often to view pseudoseizures themselves as a dissociative event. In many patients, pseudoseizures appear to be the presenting symptom of a dissociative disorder. Some authors have demonstrated a correlation between these conditions and abuse or psychological trauma (Arnold & Privitera, 1996; Betts & Boden, 1992; Bowman, 1993; Bowman & Markand, 1996; Coons, Bowman, & Milstein, 1988; Putnam et al., 1986; Synder, Rosenbaum, Rowan, & Strain, 1994).

Diagnostic instruments for assessing dissociation in seizure patients

Given the overlap of dissociative disorders with pseudoseizures and epilepsy, reliable assessment of dissociative symptoms in seizure patients is critical to effective treatment. Studies of dissociative symptoms in epileptic and pseudoseizure patients have primarily used two instruments, the DES and the Structured Clinical Interview for DSM-IV Dissociative Disorders (SCID-D; Steinberg, 1994).

How helpful are the DES and SCID-D to clinicians faced with dissociative symptoms in a seizure patient? To answer this, we review literature findings with these instruments and present new data on dissociative symptoms in pseudoseizure and epileptic subjects. We administered the DES and SCID-D to 15 adult epilepsy patients at a tertiary care epilepsy clinic and compared them to 15 age- and sex-matched pseudoseizure subjects taken from a larger sample of pseudoseizure patients (Bowman & Markand, 1996). Epilepsy subjects were evenly divided between those with partial complex seizures and those with generalized seizures. Each group was 73% female with a mean age of 34 years.

Dissociative Experiences Scale

The Dissociative Experiences Scale (DES) is a valid and reliable 28-item questionnaire that quantifies self-reported dissociative symptoms (Bernstein & Putnam, 1986). Subjects estimate the percentage of time that they experience each dissociative symptom. The score is an average of the 28 items and may range from 0 to 100. Experiences related to drug or alcohol use are excluded, but seizure-related experiences are included. The DES is a screening instrument and does not yield diagnoses. Scores of 30 or above reliably indicate PTSD or a dissociative disorder (Carlson et al., 1993).

Table 1 shows the DES scores of persons with epilepsy, pseudoseizures, and dissociative disorders from literature reports and from our epilepsy and pseudoseizure samples (Bowman & Markand, 1996; Carlson & Putnam, 1993; Devinsky, Putnam, Grafman, Bromfield, & Theodore, 1989; Loewenstein & Putnam, 1988; Ross, Joshi, & Currie, 1990). While pseudoseizure patients have more frequent dissociative experiences than epileptic patients, we found that the difference between their mean DES scores is not statistically significant ($p = 0.24$). We agree with Litwin et al. (1992) that the DES is not a particularly useful instrument for distinguishing between pseudoseizure and epileptic patients, but we find it helpful in screening for pathological levels of dissociation in these groups.

Devinsky et al. (1989) found that the DES scores of epileptic persons

Table 1. DES scores in epilepsy, pseudoseizures, and dissociative disorders

Subjects	Mean scores	Median scores
Normal adults ^a	3–10	4–6
Epilepsy patients	10.7 (SD = 11.3)*	8.7 8.4 ^b 6.8 ^c
Pseudoseizure patients	20.2 (SD = 18.21)*	14.4 ^d
Dissociative disorder NOS ⁺⁺	29–40	
Dissociative identity disorder ^{++a}	42–55	40–57

Note. Data from numerous studies are summarized in this reference.

^aCarlson & Putnam (1993).

^bDevinsky et al. (1989).

^cLoewenstein & Putnam (1988).

^dBowman & Markand (1996).

* $p = 0.24$ (epilepsy vs. pseudoseizure patients)

are significantly lower than those of DID patients. We found only 1 of 15 epileptic subjects with a DES score of 30 or above, the cutoff recommended by Carlson et al. (1993) for screening for DID. Cutoff scores for screening for DDNOS have not been established. We recommend using the DES to screen for dissociative disorders in persons who have dissociative symptoms and seizures, and further assessing for DDNOS or DID when scores are above 25.

Structured Clinical Interview for DSM-IV Dissociative Disorders

The Structured Clinical Interview for DSM-IV Dissociative Disorders (SCID-D) is a valid and reliable semistructured interview that yields DSM-IV dissociative disorder diagnoses and quantifies the severity of dissociative symptoms (Steinberg, 1994). The SCID-D provides a total score from 5 to 20 based on subscale scores for amnesia, depersonalization, derealization, identity confusion, and identity alteration. Subscales are scored as follows: 1, symptom absent; 2, mild; 3, moderate; and 4, severe. The interviewer is asked to exclude dissociative symptoms due to organic causes. This exclusion cannot be reliably made if patients have dissociative symptoms associated with seizures of unknown etiology.

Table 2 shows SCID-D scores for Steinberg, Rounsaville, and Cicchetti's (1990) dissociative disorder outpatients and for our matched epilepsy and pseudoseizure patients. To simulate a condition in which the SCID-D would be used to assess a person with seizures of unknown etiology, we included all dissociative symptoms of the epileptic patients in the SCID-D scores, even though we knew these symptoms were likely organically based.

Table 2. SCID-D scores in epilepsy, pseudoseizures, and dissociative disorders

	Epilepsy ^a (n = 15)		Pseudoseizures ^b (n = 15)		Dissociative disorders ^c (n = 18)		Epilepsy vs. pseudoseizures	Epilepsy vs. dissociative disorders
	Mean	SD	Mean	SD	Mean	SD	p ^d	p ^d
Total	8.40	2.69	13.80	4.45	17.28	4.73	0.002	0.00001
Amnesia	2.60	1.12	3.46	0.64	3.56	0.86	0.016	0.016
Depersonalization	1.53	0.92	2.86	1.12	3.56	0.70	0.012	0.00001
Derealization	1.73	0.88	2.33	1.35	2.94	1.12	0.155	0.002
Identity confusion	1.33	0.62	2.53	1.41	3.56	0.51	0.016	0.00001
Identity alteration	1.13	0.52	2.60	1.35	3.67	0.77	0.005	0.00001

^aBowman (1996).

^bFor data on a larger sample of pseudoseizure patients, see Bowman and Markand (1996).

^cSteinberg et al. (1990).

^dBased on two-tailed *t* test.

Table 3. *Dissociative symptoms suggestive of pseudoseizures or dissociative disorders in seizure patients*

	Epileptic (<i>n</i> = 15)		Pseudoseizure (<i>n</i> = 15)		<i>p</i>
	<i>n</i>	%	<i>n</i>	%	
Childhood amnesia ^a	3	20	14	93	0.0001
Adulthood amnesia ^a	5	33	13	87	0.0001
Intra-interview amnesia	0	0	7	47	0.0001
Acts like a different person	2	13	10	67	0.0001
Finds unfamiliar possessions	0	0	5	33	0.04
Internal struggles	3	20	9	60	0.06
Fugue states	1	7	6	40	0.08

^aDenotes amnesia unrelated to ictal movements.

The SCID-D total scores and all the subscales except derealization showed significantly less dissociation in epileptic than in pseudoseizure subjects. All SCID-D scores showed a highly significant difference between epileptic and dissociative disorder subjects. Two epileptic subjects (13%) received dissociative disorder diagnoses because of dissociative episodes unrelated to ictal states. Epileptic subjects exhibited a pattern of having mild to moderate amnesia (mostly associated with seizures) but mild to no symptoms in the other four dissociative symptom categories. The only epileptic subject with any identity alteration had DDNOS with ego states present. Both of the two epileptic subjects with total SCID-D scores above 10 had a concomitant dissociative disorder that appeared unrelated to the epilepsy.

The 15 pseudoseizure subjects had moderate to severe amnesia and mild to moderate levels of other dissociative symptoms. Thirteen (87%) received dissociative disorder diagnoses. Eleven had SCID-D scores above 10; each of these subjects had a dissociative disorder. Two pseudoseizure subjects but none of the epileptic subjects with SCID-D scores of 10 or less had dissociative disorders.

Table 3 shows the difference in frequency of dissociative symptoms from the SCID-D between epileptic and pseudoseizure subjects. Although testing with larger groups will be necessary to come to firm conclusions, our data suggest that the SCID-D is a useful diagnostic instrument for persons with ictal and peri-ictal dissociative symptoms. We suggest that total SCID-D scores above 10, the presence of identity alteration, the presence of even brief amnestic episodes during the interview, or a history of nonictal amnesia during adulthood or childhood

should lead to suspicion of pseudoseizures and/or a concomitant dissociative disorder. The SCID-D is helpful when patients have more than one disorder, such as epilepsy and concomitant pseudoseizures or a concomitant dissociative disorder. It also can help clinicians make judicious use of expensive diagnostic procedures such as the video-EEG.

Conclusions

Dissociative symptoms and disorders overlap with epilepsy and pseudoseizures in myriad ways that render accurate diagnosis difficult. Well-designed studies of persons with seizure and dissociative symptoms indicate that misdiagnosis is discouragingly frequent. The best antidotes for this are careful adherence to *DSM* standards for diagnosing dissociative disorders, the use of video-EEG monitoring, and systematic assessment of dissociation, such as the SCID-D provides.

In DID and DDNOS patients, rates of abnormal EEGs (33–44%) and concurrent epilepsy (approximately 10%) are higher than those in the general population. Despite this finding, studies do not support an epileptogenic etiology for DID or DDNOS. Studies of persons with concurrent diagnoses of epilepsy and dissociative disorders indicate inaccurate diagnosis of both disorders. Among dissociative disorder patients, trance states and pseudoseizures are mistaken for epilepsy when ictal EEGs are not considered. Conversely, epilepsy may be missed in dissociative disorder patients if a single normal nonictal EEG is recorded.

Among epileptic patients with dissociative symptoms, only a minority have concomitant dissociative disorders. A history of child abuse is a good clue to look further for pseudoseizures and dissociative disorders. Drake's (1986) study shows that as many as 40% of persons diagnosed with epilepsy and DID may not have epilepsy. In these persons, care should be taken to rule out concomitant or undiagnosed pseudoseizures. At least occasional organic dissociative symptoms, such as fugue and depersonalization, are common among epileptic persons. Identity alteration appears least common but may be the symptom most likely to result in misdiagnosed DID. The best course for clinicians is systematic assessment of dissociative symptoms with an instrument such as the SCID-D. This symptom pattern appears associated with epilepsy: not more than mild levels of both depersonalization and derealization; episodes of identity alteration that are brief, not elaborate, and associated with ictal periods; and an absence of unusual childhood or adulthood amnesia outside of seizure periods. Above all, careful adherence to *DSM-IV* criteria for DDNOS and DID will reduce misdiagnosis of these disorders in epileptic persons.

One error that appears common is failure to diagnose pseudoseizures. Here the video-EEG is very helpful but expensive. Screening with the DES and SCID-D may be a good way to decide whether a video-EEG is indicated to rule out pseudoseizures. A score above 25 on the DES or a score above 10 on the SCID-D should raise strong suspicions that pseudoseizures may be present *with or without concurrent epilepsy*. Given the existence of concomitant epilepsy and pseudoseizures, it is critically important not to narrow diagnostic thinking to look only for one or the other condition. When pseudoseizures have been diagnosed, conducting a systematic assessment of dissociative symptoms is indicated because of the very high rates of dissociative disorders in these patients. It is only with proper diagnosis that patients with these disorders can receive treatment to relieve their distress.

References

- Ackner, B. (1954). Depersonalization: II. Clinical syndromes. *Journal of Mental Science*, *100*, 854–872.
- Ahern, G. L., Herring, A. M., Tackenberg, J., Seeger, J. F., Oommen, K. J., Labiner, D., & Weinand, M. E. (1993). The association of multiple personality and temporolimbic epilepsy: Intracarotid amobarbital test observations. *Archives of Neurology*, *50*, 1020–1025.
- Alper, K. (1994). Nonepileptic seizures. *Neurologic Clinics*, *12*(1), 153–173.
- American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washington, DC: Author.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.
- Arnold, L. M., & Privitera, M. D. (1996). Psychopathology and trauma in epileptic and psychogenic seizure patients. *Psychosomatics*, *37*, 438–443.
- Benson, D. F., Miller, B. L., & Signer, S. F. (1986). Dual personality associated with epilepsy. *Archives of Neurology*, *43*, 471–474.
- Bernstein, E. M., & Putnam, F. W. (1986). Development, reliability, and validity of a dissociation scale. *Journal of Nervous and Mental Disease*, *174*, 727–735.
- Betts, T., & Boden, S. (1992). Diagnosis, management and prognosis of a group of 128 patients in non-epileptic attack disorder: Part II. Previous childhood sexual abuse in the aetiology of these disorders. *Seizure*, *1*, 27–32.
- Bliss, E. (1980). Multiple personalities: A report of 14 cases with implications for schizophrenia. *Archives of General Psychiatry*, *37*, 1388–1397.
- Bowman, E. S. (1993). Etiology and clinical course of pseudoseizures: Relationship to trauma, depression, and dissociation. *Psychosomatics*, *34*, 333–342.
- Bowman, E. S. (1996). [EEG findings in 45 pseudoseizure patients]. Unpublished data.
- Bowman, E. S., & Markand, O. N. (1996). Psychodynamics and psychiatric diagnoses of pseudoseizure subjects. *American Journal of Psychiatry*, *53*, 57–63.
- Braun, B. G. (1983). Psychophysiological phenomena in multiple personality and hypnosis. *American Journal of Clinical Hypnosis*, *26*, 124–137.
- Brende, J. O., & Rinsley, D. B. (1981). A case of multiple personality with psychological automatism. *Journal of the American Academy of Psychoanalysis*, *9*, 129–151.

- Carlson, E. B., & Putnam, F. W. (1993). An update on the Dissociative Experiences Scale. *Dissociation*, 6, 16–27.
- Carlson, E. B., Putnam, F. W., Ross, C. A., Torem, M., Coons, P., Dill, D. L., Loewenstein, R. J., & Braun, B. G. (1993). Validity of the Dissociative Experiences Scale in screening for multiple personality disorder: A multicenter study. *American Journal of Psychiatry*, 150, 1030–1036.
- Cocker, K. I., Edwards, G. A., Anderson, J. W., & Meares, R. A. (1994). Electrophysiological changes under hypnosis in multiple personality disorder: A two-case exploratory study. *Australian Journal of Clinical and Experimental Hypnosis*, 22, 165–176.
- Cocores, J. A., Bender, A. L., & McBride, E. (1984). Multiple personality, seizure disorder, and the electroencephalogram. *Journal of Nervous and Mental Disease*, 172, 436–438.
- Coons, P. M. (1992). Dissociative disorder not otherwise specified: A clinical investigation of 50 cases with suggestions for typology and treatment. *Dissociation*, 5, 187–195.
- Coons, P. M., Bowman, E. S., & Milstein, V. (1988). Multiple personality disorder: A clinical investigation of 50 cases. *Journal of Nervous and Mental Disease*, 176, 519–527.
- Coons, P. M., Milstein, V., & Marley, C. (1982). EEG studies of two multiple personalities and a control. *Archives of General Psychiatry*, 39, 823–825.
- Coryell, W. (1983). Multiple personality and primary affective disorder. *Journal of Nervous and Mental Disease*, 171, 388–390.
- Cutler, B., & Reed, J. (1975). Multiple personality: A single case study with a 15-year follow-up. *Psychological Medicine*, 5, 18–26.
- Devinsky, O., Putnam, F., Grafman, J., Bromfield, E., & Theodore, W. H. (1989). Dissociative states and epilepsy. *Neurology*, 39, 835–840.
- Drake, M. E. (1986). Epilepsy and multiple personality: Clinical and EEG findings in 15 cases [abstract]. *Epilepsia*, 27, 635.
- Flor-Henry, P., Tomer, R., Kumpula, Z. J., & Yeudall, L. T. (1990). Neurophysiological and neuropsychological study of two cases of multiple personality syndrome and comparison with chronic hysteria. *International Journal of Psychophysiology*, 10, 151–161.
- Horton, P., & Miller, D. (1972). The etiology of multiple personality. *Comprehensive Psychiatry*, 13, 151–159.
- Hughes, J. R., Kuhlman, D. T., Fichtner, C. G., & Gruenfeld, M. J. (1990). Brain mapping in a case of multiple personality. *Clinical Electroencephalography*, 21, 200–209.
- Kanner, A. M., Morris, H. H., Luders, H., Dinner, D. S., Wyllie, E., Medendorp, S. V., & Rowan, A. J. (1990). Supplementary motor seizures mimicking pseudoseizures: Some clinical differences. *Neurology*, 40, 1404–1407.
- Kuyk, J., Van Dyck, R., & Spinhoven, P. (1996). The case for a dissociative interpretation of pseudoepileptic seizures. *Journal of Nervous and Mental Disease*, 184, 468–474.
- Larmore, K., Ludwig, A. M., & Cain, R. L. (1977). Multiple personality: An objective case study. *British Journal of Psychiatry*, 131, 35–40.
- Lipton, S. D. (1943). Dissociated personality: A case report. *Psychiatric Quarterly*, 17, 33–56.
- Litwin, R. G., Walker, J. A., & Laxer, K. D. (1992). A double-blind prospective study to differentiate patients with epileptic versus nonepileptic seizures [abstract]. *Epilepsia*, 33(Suppl. 3), 133.

- Loewenstein, R. J., & Putnam, F. W. (1988). A comparison study of dissociative symptoms in patients with partial complex seizures, MPD, and posttraumatic stress disorder. *Dissociation*, 4(4), 17–23.
- Ludwig, A. M., Brandsma, J. M., Wilbur, C. B., Bendfeldt, F., & Jameson, D. H. (1972). The objective study of a multiple personality, or, are four heads better than one? *Archives of General Psychiatry*, 26, 298–310.
- Mesulam, M. (1981). Dissociative states with abnormal temporal lobe EEG: Multiple personality and the illusion of possession. *Archives of Neurology*, 38, 176–181.
- Morselli, G. E. (1953). Personalita alternate e patologia affettiva [Alternate personality and affective disorders]. *Archivo de Psicologia*, 14, 579–589.
- Nash, J. L. (1993). Pseudoseizures: Etiologic and psychotherapeutic considerations. *Southern Medical Journal*, 86, 1248–1252.
- Nemiah, J. C. (1991). Dissociation, conversion, and somatization. In A. Tasman & S. M. Goldfinger (Eds.), *American Psychiatric Press Review of Psychiatry* (Vol.10, pp. 248–260). Washington, DC: American Psychiatric Press.
- Perrine, K., & Congert, S. (1994). Neurobehavioral problems in epilepsy. *Neurologic Clinics of North America*, 12, 129–151.
- Pohl, R. L. (1977). Multiple personality in a middle-aged woman. *Psychiatric Opinion*, 14(2), 35–39.
- Putnam, F. W. (1982, October). Traces of Eve's faces. *Psychology Today*, p. 88.
- Putnam, F. W., Guroff, J. J., Silberman, E., Barban, L., & Post, R. M. (1986). The clinical phenomenology of multiple personality disorder: A review of 100 recent cases. *Journal of Clinical Psychiatry*, 47, 285–293.
- Ramchandani, D., & Schindler, B. A. (1993). Evaluation of pseudoseizures: A psychiatric perspective. *Psychosomatics*, 34, 70–79.
- Rosenstein, L. D. (1994). Potential neuropsychologic and neurophysiologic correlates of multiple personality disorder: Literature review and two case studies. *Neuropsychiatry, Neuropsychology and Behavioral Neurology*, 7, 215–229.
- Ross, C. A., Heber, S., Norton, G. R., & Anderson, G. (1989). Somatic symptoms in multiple personality disorder. *Psychosomatics*, 30, 154–160.
- Ross, C. A., Heber, S., Norton, G. R., Anderson, G., del Campo, M., & Pillay, N. (1989). Differentiating multiple personality disorder and complex partial seizures. *General Hospital Psychiatry*, 11, 54–58.
- Ross, C. A., Joshi, S., & Currie, R. (1990). Dissociative experiences in the general population. *American Journal of Psychiatry*, 147, 1547–1552.
- Salama, A. A. (1980). Multiple personality: A case study. *Canadian Journal of Psychiatry*, 25, 569–572.
- Saxe, G. N., Chinman, G., Berkowitz, R., Hall, K., Lieberg, G., Schwartz, J., & van der Kolk, B. A. (1994). Somatization in patients with dissociative disorders. *American Journal of Psychiatry*, 151, 1329–1334.
- Schenck, C. H., Milner, D., Hurlwitz, T. D., Bundlie, S., & Mahowald, M. W. (1989). A polysomnographic and clinical report on sleep-related injury in 100 adult patients. *American Journal of Psychiatry*, 146, 1166–1173.
- Schenk, L., & Bear, D. (1981). Multiple personality and related dissociative phenomena in patients with temporal lobe epilepsy. *American Journal of Psychiatry*, 138, 1311–1315.
- Snyder, S. L., Rosenbaum, D. H., Rowan, A. J., & Strain, J. J. (1994). SCID diagnosis of panic disorder in psychogenic seizure patients. *Journal of Neuropsychiatry*, 6, 261–266.
- Steinberg, M. (1994). *Structured Clinical Interview for DSM-IV Dissociative Disorders-Revised (SCID-D-R)*. Washington, DC: American Psychiatric Press.

- Steinberg, M., Rounsaville, B., & Cicchetti, D. V. (1990). The Structured Clinical Interview for DSM-III-R Dissociative Disorders: Preliminary report on a new diagnostic instrument. *American Journal of Psychiatry*, 147, 76-82.
- Thigpen, C. H., & Cleckley, H. (1954). A case of multiple personality. *Journal of Abnormal and Social Psychology*, 49, 135-151.
- Torem, M. S. (1993). Non-epileptic seizures as a dissociative disorder. In A. J. Rowan & J. R. Gates (Eds.), *Non-epileptic seizures* (pp. 173-179). Boston: Butterworth-Heinemann.
- Wyler, A. R., Richey, E. T., & Hermann, B. P. (1989). Comparison of scalp to subdural recording for localizing epileptogenic foci. *Journal of Epilepsy*, 2, 91-96.