

## Intensive EEG Monitoring and Psychological Studies of Patients with Pseudoepileptic Seizures

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**Summary:** EEG/closed-circuit television long-term monitoring was used as a definitive diagnostic tool to identify and characterize 25 patients with pseudoepileptic seizures and a similar group of subjects with epilepsy, confirming the value of the procedure. The groups did not differ with respect to intelligence, neuropsychological impairment, or incidence of potential etiological factors for seizures. Scores on the Minnesota Multiphasic Personality Inventory (MMPI) and the Hypochondriasis, Hysteria, and Schizophrenia Scales were significantly higher for the pseudoepileptic group than for the other subjects. As a whole, the former patients exhibited an MMPI profile pattern frequently seen in the conversion form of hysteria. A set of three rules derived from the MMPI profiles was used to classify the patients correctly in 80-90% of cases. As evaluated by the Washington Psychosocial Seizure Inventory, psychosocial problems of patients with pseudoepileptic seizures were more severe in certain areas, and appeared to reflect early family background problems and inappropriate management of their disorders. **Key Words:** EEG monitoring—Epilepsy—Hysteria—Pseudoepileptic seizures—Minnesota Multiphasic Personality Inventory—Washington Psychosocial Seizure Inventory.

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Pseudoepileptic seizures are paroxysmal episodes of altered behavior which superficially resemble epileptic attacks, but which lack characteristic epileptic clinical and electrographic features and have no identifiable physiological cause (Liske and Forster, 1964). These episodes are often unsuspected, and it is not unusual for patients having such attacks to be managed as though they had epilepsy. The prevalence and magnitude of difficulties in medical management contingent on this disorder are unknown. It has been estimated that perhaps 5-36% of patients thought to have epilepsy might actually have pseudoepileptic episodes rather than, or in addition to, epileptic attacks (Pond et al., 1960; Desai et al., 1979; Ramani et al., 1980).

It is well known that observation of clinical and accompanying EEG features of the episodes in question can be crucial in definitively making this

diagnosis. Some authors have reported that inducing attacks through use of suggestion by hypnosis (Schwarz et al., 1955), saline injection (Cohen and Suter, 1981), or other relatively simple activation techniques (Luther et al., 1982), while recording the EEG, is an inexpensive and effective means of identifying pseudoepileptic seizures. Although more costly, long-term EEG and closed-circuit television (CCTV) monitoring has proven useful in the same way (Desai et al., 1979; Mattson, 1980; Ramani et al., 1980; Feldman et al., 1982; Gulick et al., 1982; King et al., 1982; Ramani and Gumnit, 1982; Roy, 1982), and it has the advantage that it can be used to record spontaneous episodes, thus helping to assure that the attacks are truly representative of those ordinarily experienced in each case.

The potential role of psychological assessments in characterizing and identifying patients with pseudoepileptic seizures has not been well explored. While emotional problems in these cases are ubiquitous and often fairly obvious, organic features,

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documentable by neuropsychological testing, may also be present (Slater, 1965; Whitlock, 1967; Standage, 1975; Roy, 1977; Ramani et al., 1980). In addition, an exploration of psychological factors can contribute toward better understanding of each individual and aid in directing the appropriate therapeutic management. Finally, it is not entirely clear how patients with pseudoepileptic seizures compare psychologically with similar subjects with epilepsy.

In the present investigation we evaluated patients identified as having solely pseudoepileptic attacks or only epileptic seizures during EEG/CCTV monitoring. For purposes of clarity we avoided subjects who might possibly have had both types of attacks. Their clinical and EEG features were compared and their intellectual, neuropsychological, emotional, and psychosocial characteristics were assessed. In addition, we sought to determine whether or not psychological profiles could be used to advise the epileptologist that pseudoepileptic seizures might be present in a problem case, thereby helping to select individuals to be referred for the recording of these episodes.

### METHODS

The patients for this research were selected from among 150 consecutive individuals who were referred for inpatient EEG/CCTV monitoring at the Regional Epilepsy Center of the University of Washington. Each patient underwent 16-channel EEG telemetry and continuous CCTV observation for as long as deemed necessary to satisfy the questions asked at the time of admission. Nurses continually observed the patients, either directly or via CCTV monitors. When the episodes of interest occurred, the patients were actively examined to identify their levels of awareness and responsiveness, and clinical signs of the attacks were observed. Changes in appearance not visible on CCTV, such as pupillary dilatation, flushing, diaphoresis, and cyanosis, were documented. Limited ictal and post-ictal neurological examinations were performed when possible so that assessments of orientation, speech, ability to follow commands, memory, strength of extremities, deep tendon reflexes, and plantar responses were available, although not in all instances. Observations noted by the nurses were compared with the video sequences to complete clinical description of events. Sections of EEG corresponding to these attacks were played back from magnetic tape again and again using different filters and sensitivities to maximize definition. The paper-written EEG was compared with EEG channels superimposed on the video sequences so that

there would be no doubt as to timing of clinical events relative to the EEG. When these recordings were reviewed by the electroencephalographer, referring physicians, and nurses, it was possible to determine with certainty that none of the patients with pseudoepileptic seizures manifested epileptic EEG concomitants, and that the episodes were truly representative of the usual attacks experienced in each case.

Of the 28 individuals identified as having pseudoepileptic seizures, 21 females and four males completed all of the tests and constituted the study group. From the same series of referrals for EEG/CCTV monitoring, another 25 patients shown to have only epileptic seizures with confirmatory ictal EEG changes were selected for comparative purposes. This group was chosen on the basis of having similar age, sex distribution, and level of education to that of the subjects with pseudoepileptic attacks.

Each patient was interviewed regarding his or her seizures, and medical, neurological, and psychosocial histories were obtained. Each was administered a complete battery of tests which assessed four areas. First, intelligence was evaluated by the Wechsler Adult Intelligence Scale (WAIS). Second, neuropsychological functions were appraised by means of the Neuropsychological Battery for Epilepsy (Dodrill, 1978). This battery consists of 16 perceptual, motor, and cognitive test measures selected for and standardized on persons with epilepsy. Third, emotional adjustment was evaluated by means of the Minnesota Multiphasic Personality Inventory (MMPI). Objective assessment of psychosocial difficulties was accomplished by administering the Washington Psychosocial Seizure Inventory (WPSI) (Dodrill et al., 1980). The WPSI evaluates adequacy of functioning in areas pertaining to employment, financial status, interpersonal adjustment and relationships with family members, ability to deal with seizures and to follow medical advice, and general emotional adjustment. All tests were administered by highly trained psychometrists who were not familiar with the purposes of this study and who, in most cases, had no definitive diagnostic information.

To compare the test results of patients with pseudoepileptic attacks with those of persons with epileptic seizures, Student's *t* statistic was applied to each test variable. Because the MMPI scores between the two groups differed importantly, it seemed worthwhile to make further use of the MMPI data. The groups with pseudoepileptic attacks or epilepsy were each subdivided into subgroups of 15 and 10 patients. Based on analyses of scale scores and profiles of the 15 cases of each

type, we devised a set of rules for using the MMPI to differentiate between the patients with pseudoepileptic episodes and those with epilepsy. According to these rules, a person was classified as having pseudoepileptic attacks if any one of the following were true of the Scale scores of the MMPI profile: (1) Hysteria (Hs) or Hypochondriasis (Hy) is 70 or higher and one of two highest points disregarding the Masculinity-femininity (Mf) and Social introversion (Si) Scales; (2) Hs or Hy is 80 or higher, even though not among the two highest points; or (3) Hs and Hy are both higher than 59 and both are at least 10 points higher than Depression (D). These rules were blindly applied to the remaining 20 patients to test their effectiveness in separating subjects with pseudoepileptic attacks from individuals with epilepsy.

### RESULTS

The mean age and education levels of the group of patients with pseudoepileptic seizures were 28.2 years (SD 10.35) and 12.20 years (SD 2.58), respectively. Parallel values for the group with epilepsy were 29.8 years (SD 9.70) and 12.52 years (SD 1.61). The mean age at onset of attacks was significantly ( $t = 5.03$ ,  $p < 0.001$ ) older for the patients without epilepsy (22.92 years, SD 11.77) than for those with epilepsy (12.36 years, SD 7.07). Interviews revealed that the neurological histories were positive equally often in the two groups (Table 1), although multiple etiological factors were recalled more often by the patients with pseudoepileptic attacks. Major neurological findings, such as hemipareses, visual field defects, language difficulties, and dementias, were not preponderant in either group. Referring physicians thought that all of the cases studied here were refractory to medical treatment.

Of the patients with pseudoepileptic seizures, 21 subjects had undergone active psychiatric treatment or psychological counseling at some time in the past; these included 13 who had required psychiatric hospitalization. In contrast, 12 patients with epilepsy had been similarly treated, and five

of these received inpatient care. This difference was significant ( $\chi^2 = 7.22$ ,  $p < 0.01$ ). Only seven of the patients ultimately shown to have pseudoepileptic attacks were admitted to the hospital for monitoring studies with notes on the chart suggesting that this diagnosis was being considered. Of these 25 individuals, all but two were taking antiepileptic medication and 11 were taking more than one of these medications. Most of the cases with epilepsy had well-established diagnoses, all were taking antiepileptic agents, and nearly all were candidates for cortical resection to treat their epilepsy. As primary diagnoses, 23 had partial seizures (21 complex, 2 elementary) and two had generalized seizures (1 absence, 1 absence and tonic-clonic).

One of the 25 patients with pseudoepileptic attacks manifested epileptiform discharges (Zivin and Ajmone Marsan, 1968) in a total of 67 standard EEGs during wakefulness and sleep prior to the monitorings. This compares with exactly the reverse (24 of 25 exhibiting discharges) in 89 recordings taken on the subjects with epilepsy. Two of the former and four of the latter had clinical episodes during standard EEG recordings. The pseudoepileptic patients had a mean of 3.48 attacks (SD 2.62) during an average of 115.68 h (SD 69.35) of EEG/CCTV monitoring. The corresponding figures for the patients with epilepsy were 8.64 attacks (SD 8.23) in an average of 191.44 h (SD 130.26) of monitoring. This difference in length of observation is attributable to the intent of the monitorings (differential diagnosis versus localization of seizure onset) in the two groups of patients.

Table 2 shows that only four of the pseudoepileptic patients had attacks that somewhat resembled major convulsive episodes. Preponderant features of most episodes were clearly nonepileptic manifestations, such as emotional outbursts, acting out, and withdrawal from contact with the environment. Unresponsiveness during the attack could be documented in 17 of the 25 patients with pseudoepileptic episodes. Evidence in the physical examination that attacks might have been epileptic seizures was routinely sought but never found. Usu-

TABLE 1. Cases with histories of events possibly affecting the brain, as reported by patients

| Event                                                                                   | Epilepsy | Not epilepsy |
|-----------------------------------------------------------------------------------------|----------|--------------|
| Head injury with loss of consciousness/sequelae                                         | 5        | 7            |
| Infectious disorder with high fever/sequelae                                            | 6        | 2            |
| Brain surgery for any reason                                                            | 2        | 2            |
| Other (birth trauma, sunstroke, severe heat exhaustion, partial drowning, gas exposure) | 3        | 1            |
| More than one of the above                                                              | 2        | 8            |
| None of the above                                                                       | 7        | 5            |
| Total                                                                                   | 25       | 25           |

TABLE 2. *Preponderant clinical manifestations of pseudoepileptic seizures observed during monitoring studies*

|                                                | Responsive | Unresponsive |
|------------------------------------------------|------------|--------------|
| Panic, emotional outbursts, choking            | 4          | 3            |
| Posturing, running, swimming, walking activity | 1          | 5            |
| Major diffuse tonic and/or clonic movements    | 1          | 3            |
| Minor localized or diffuse clonic activity     | 2          | 2            |
| Sudden falling                                 | 0          | 2            |
| Episodic disorientation                        | 1          | 0            |
| Fuguelike state                                | 0          | 1            |
| Total                                          |            | 25           |

ally, each patient had similar attacks throughout the monitoring. Only one patient had more than incidental variation from attack to attack.

Summary scores for tests of abilities are given in Table 3. Not only were there no statistically significant differences across the two groups on these variables, but not a single difference appeared on any of the 11 subtests of the WAIS or any of 16 measures from the Neuropsychological Battery for Epilepsy. Thus, there were no differences whatever between the groups with respect to any type of mental ability.

There were major differences between the groups in MMPI scores and profiles (Fig. 1). These differences were especially prominent on the Hs and Hy scales, wherein the group with pseudoepileptic attacks had comparatively higher scores than the group with epilepsy. As a whole, the pseudoepileptic subjects demonstrated an MMPI pattern like that frequently seen in the conversion form of hysteria (Hs and Hy elevated and higher than D) (Dahlstrom et al., 1972). Exactly the reverse was found for patients with epilepsy. The MMPI also showed that the patients with pseudoepileptic attacks were more manipulative (higher Pd Scale score) and that they had more unusual thought patterns (higher Sc Scale score) than the group with epilepsy.

The three rules formulated from the MMPI scores of 15 randomly chosen subjects within each group were tested on the original cases from which they

were derived and applied to the remaining 20 subjects for cross-validation purposes. The results are reported in Table 4. Overall, 80–90% of the cases were correctly classified by the MMPI rules alone when using the results of the EEG/CCTV monitoring as the definitive criterion for classification. The cross-validation study should represent an approximation of the extent to which the MMPI rules might apply to future similar cases.

Profiles derived from the WPSI are shown in Fig. 2. Here, higher scores for the pseudoepileptic patients indicate that they reported more difficulties in early family relationships, less ability to cope with their episodes, and more concerns in establishing relationships with physicians and in regularly taking medications.

## DISCUSSION

We agree with the many authors who have stated that it is essential to observe attacks directly to identify pseudoepileptic seizures definitively. Furthermore, without simultaneous EEG recording, clinical manifestations of these episodes may prove misleading (Gulick et al., 1982; Ramani et al., 1980). One should not lose sight of the fact that in our subjects, as in the cases reported by Gulick et al. (1982), the diagnosis of pseudoepileptic seizures was not even considered in the majority of individuals in whom these attacks were ultimately identified.

TABLE 3. *Mean scores on summary measures of abilities*

| Test variable                                       | Epilepsy | Not epilepsy | <i>t</i> |
|-----------------------------------------------------|----------|--------------|----------|
| Intelligence                                        |          |              |          |
| WAIS Verbal IQ                                      | 102.48   | 99.12        | 0.94     |
| WAIS Performance IQ                                 | 98.04    | 95.32        | 0.76     |
| WAIS Full-Scale IQ                                  | 100.60   | 97.32        | 0.99     |
| Neuropsychological Battery                          |          |              |          |
| Summary: percentage of scores outside normal limits | 45.96    | 51.16        | −0.82    |

WAIS, Wechsler Adult Intelligence Scale; IQ, intelligence quotient.

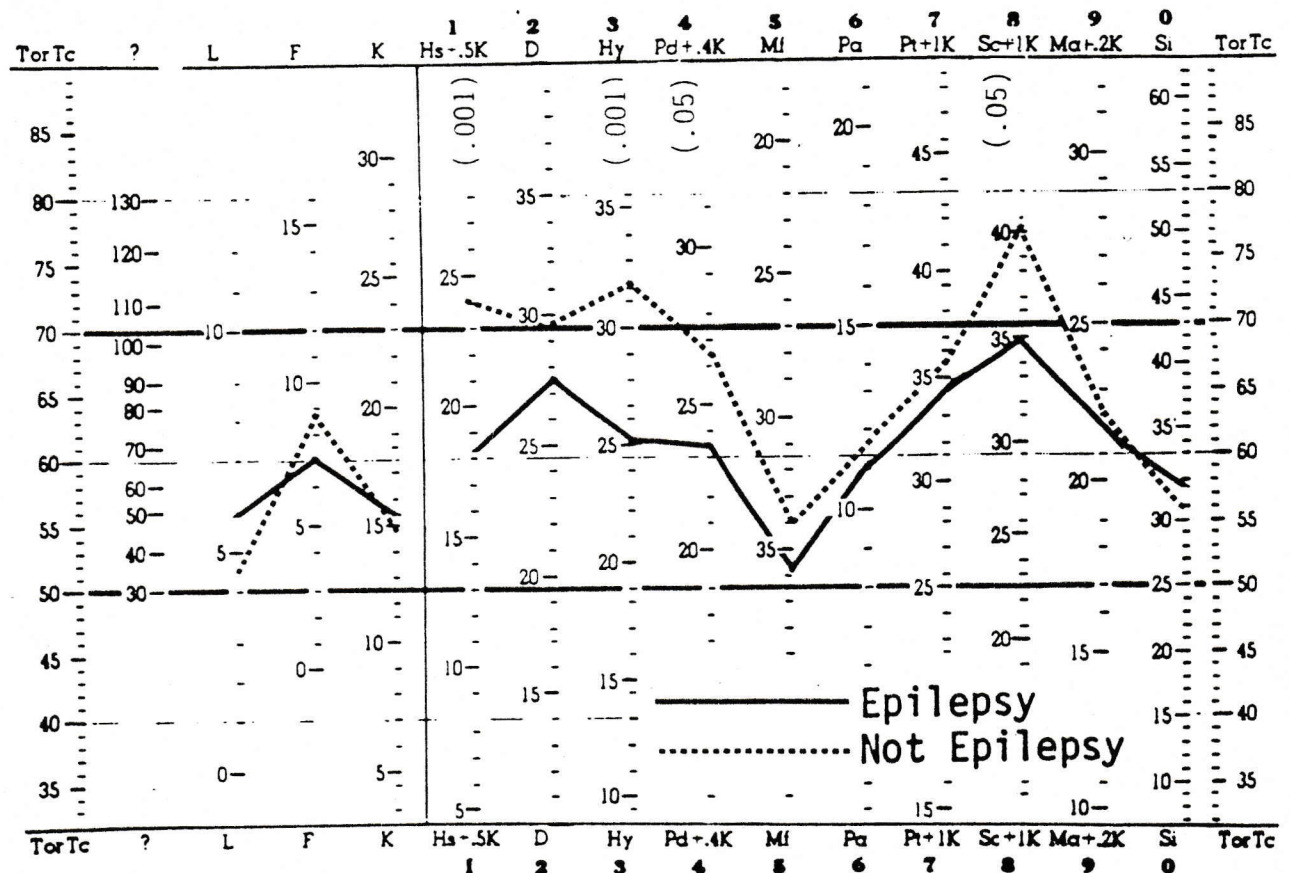


FIG. 1. Average profiles of patients with epileptic or pseudoepileptic seizures on the Minnesota Multiphasic Personality Inventory. (Profile form copyright 1966 by the Psychological Corporation; reproduced by permission.)

As recently reported for comparably studied pseudoepileptic patients (Cohen and Suter, 1981; Gulick et al., 1982; Luther et al., 1982), we observed a wide range of seizure-like manifestations in our subjects. The spontaneous attacks recorded by Gulick et al. (1982) closely resembled those observed in our patients. In both series, motor activity was common, although convulsive events did not appear genuine. In our patients, nonconvulsive attacks often included a preponderance of emotional outbursts or patterned movements. Choking and paniclike states and activity superficially resembling "psychomotor" automatisms were frequent in appearance. Unresponsiveness could be found to accompany most of these manifestations. Also, our observations were consistent with those of Gulick et al. (1982), who reported that a stereotyped pattern in a series of attacks in the same patient was more common than variability from one episode to another. Additional features of pseudoepileptic seizures routinely observed included gradual onsets, nonphysiological and exaggerated progressions of events, periods of normal behavior or incongruous responsiveness during the ictus, lack of postictal

somnolence and confusion, and an inappropriate attitude, such as smiling during or immediately after an attack.

Patients with pseudoepileptic seizures alone may well have nonepileptiform EEG abnormalities (Finlayson and Lucas, 1979; 44% of our cases). Even epileptiform discharges are occasionally found in individuals presumably experiencing only pseudoepileptic attacks (Standage, 1975; King et al., 1982; Ramani et al., 1980; one of our subjects). It is unlikely, however, that the incidence of epileptiform discharges in patients with pseudoepileptic seizures alone would be much higher than in the general population never having experienced an epileptic seizure (2.2% in the series of Zivin and Ajmone Marsan, 1968).

As noted above, no test of abilities differentiated our groups of patients. However, the findings from the neuropsychological tests are of interest, in that about one-half of the tests were outside normal limits for both groups. Such a general level of performance is in the range of a very mild to mild impairment in brain functions (Dodrill, 1978). It is likely that this reflects the very frequent positive

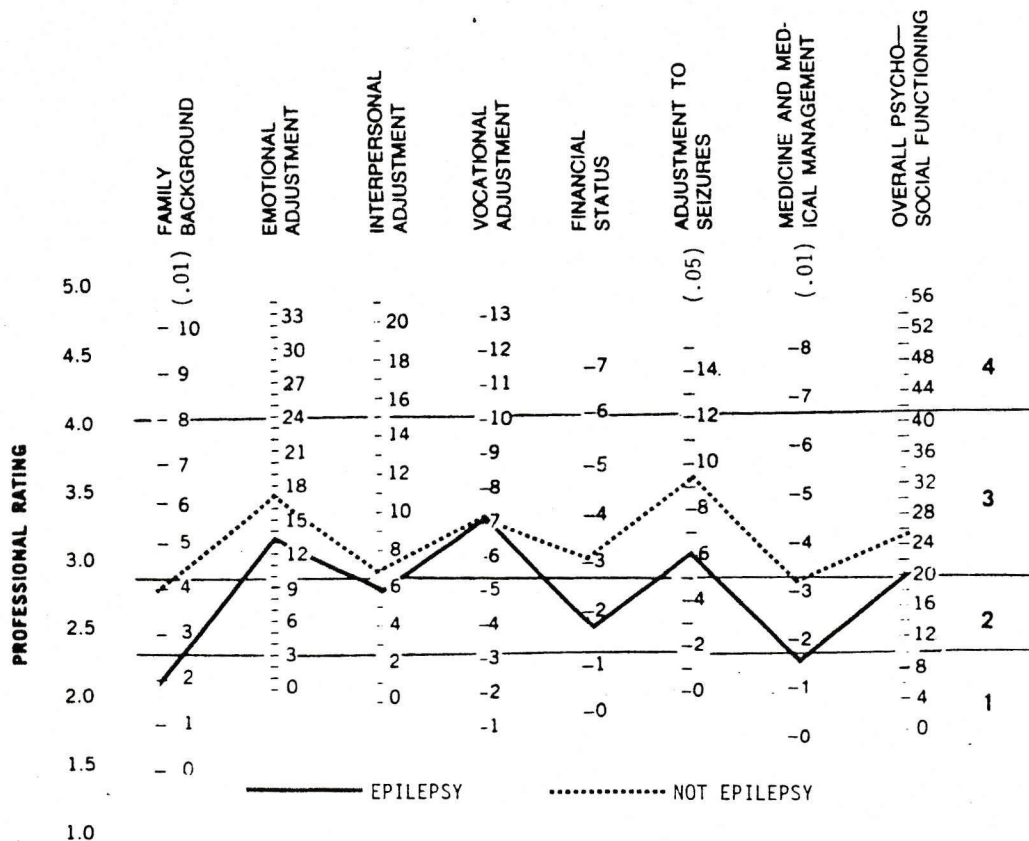


FIG. 2. Average profiles of patients with epileptic or pseudoepileptic seizures on the Washington Psychosocial Seizure Inventory. (Profile form copyright 1978 by Carl B. Dodrill.)

neurological histories (Table 1). Thus, both groups exhibited evidence for brain damage or impairment of brain functions. It is clear that while psychiatric problems are often associated with pseudoepileptic seizures, neurological difficulties are also encountered. The presence of organic elements in patients with pseudoepileptic seizures has been suggested earlier (Slater, 1965; Whitlock, 1967; Standage, 1975; Roy, 1977; Ramani et al., 1980). Decreased performances on the neuropsychological tests indicate that adaptive abilities are diminished. It has been our experience that when this occurs, problems in the psychiatric and psychosocial areas frequently appear. Also, ours and other studies raise the possibility that organic factors may, in a number of cases, contribute toward the appearance of pseudoepileptic seizures.

Certain types of psychological stressors may ultimately be shown to be associated with the appearance of pseudoepileptic attacks. Sexual exploitation of females in childhood or adolescence may be such a factor. Not only has this been reported previously for females with pseudoepileptic seizures (Gross, 1970; Goodwin et al., 1979; La-Barbera and Dozier, 1980), but we observed it on a number of occasions, again only in females. Of the

17 females with pseudoepileptic seizures on whom we had complete WPSI data, six (35%) had elevated scores on the Family Background Scale (Fig. 2), indicating troubled early family relationships. Although it was not possible to obtain definitive psychosexual histories in some cases, it may well have been that most of these women had been sexually exploited. The results on the adjustment to seizures and the medicine and medical management scales of the WPSI indicate that the pseudoepileptic patients had many problems. This may be related to the fact that they had not been well understood medically and that they had been treated inappropriately for epilepsy. The difference in the WPSI scores on these scales for the two groups indicates that such treatment, inappropriate in one instance and appropriate but equally ineffective in the other, differed in their impacts on the groups. The patients with pseudoepileptic seizures were having a great deal of trouble in understanding and coming to grips with their disorders. Consequently, rapport with physicians and compliance in the taking of medications were often compromised.

A diagnosis of pseudoepileptic seizures should not be viewed as necessarily implying a diagnosis of hysteria, although these attacks are among the

TABLE 4. Comparison of MMPI and monitoring classifications

| Monitoring classification       | MMPI rule classification |              |
|---------------------------------|--------------------------|--------------|
|                                 | Epilepsy                 | Not epilepsy |
| Original group (n = 15)         |                          |              |
| Epilepsy                        | 14 (93%)                 | 1 (7%)       |
| Not epilepsy                    | 4 (27%)                  | 11 (73%)     |
| Cross-validation group (n = 10) |                          |              |
| Epilepsy                        | 8 (80%)                  | 2 (20%)      |
| Not epilepsy                    | 1 (10%)                  | 9 (90%)      |
| All patients (n = 25)           |                          |              |
| Epilepsy                        | 22 (88%)                 | 3 (12%)      |
| Not epilepsy                    | 5 (20%)                  | 20 (80%)     |

MMPI, Minnesota Multiphasic Personality Inventory.

symptoms composing the stable syndrome of hysteria (Perley and Guze, 1962). Admittedly, the majority of our patients were females, as is commonly found in hysteria (Flor-Henry et al., 1981), and the majority demonstrated hysterical features when evaluated clinically. However, one should note that conversion symptomatology is not restricted to hysteria (Chodoff, 1982; Ramani et al., 1980), and that the MMPI rules we have set up would probably identify persons with a broad range of conversion symptoms going beyond those that could confidently be attributable to "hysteria." Table 4 and the MMPI rules reveal that possibly as many as 80% of our pseudoepileptic patients demonstrated conversion symptomatology in one form or another, with or without other psychiatric manifestations. We noted, however, that sociopathic features suggested by higher scores (greater than 70) on the Pd Scale were found in eight of our patients. In three cases this was the predominant pattern on the MMPI. Clinically, these last patients were noted to have manipulative and attention-seeking qualities. In addition, a number of our patients had somewhat elevated scores on the Sc Scale of the MMPI, which added an aspect of peculiar thinking to the total picture. All of these factors contributed toward the statistically significant findings noted in Fig. 1.

The MMPI rules are of interest because of their usefulness in differentiating pseudoepileptic from epileptic patients, as compared with the definitive diagnosis established using EEG/CCTV monitoring. Conclusions based on the MMPI rules were correct 80–90% of the time when applied to the cases of this series (Table 4). We have considered that it may prove possible to use the MMPI rules to inexpensively screen for those patients in whom the yield of pseudoepileptic seizures during EEG/CCTV monitoring would be especially high. Caution is urged in this use, however, as our findings were based on relatively small samples and our misclassification rate of 10–20% is considerable. Also, the

applicability of the MMPI rules needs to be validated by other investigators.

In conclusion, this study confirms the value of long-term EEG/CCTV monitoring for identifying patients with pseudoepileptic seizures. It has shown that such individuals are not easy to identify on the basis of clinical grounds alone. The majority of patients with pseudoepileptic attacks have positive neurological histories which may well have contributed to the consideration that epilepsy was present. Similarly, the histories suggest that earlier brain insults might have resulted in compromised adaptive abilities observed in neuropsychological tests. The latter perhaps even facilitated the appearance of pseudoepileptic attacks. The prominent abnormalities found in the MMPIs of patients with pseudoepileptic seizures suggest that this test might be used to inexpensively screen cases to be referred for definitive diagnostic EEG/CCTV recording of these attacks.

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## RESUMEN

Para identificar y caracterizar a 25 pacientes con ataques pseudoepilépticos y a un grupo similar de sujetos con epilepsia se ha llevado a cabo una monitorización a largo plazo con EEG/CCTV como una prueba diagnóstica definitiva, confirmando el valor de estas técnicas. Los grupos no se diferenciaron con respecto a inteligencia, alteración neuropsicológica o la incidencia de factores potencialmente etiológicos de ataques. Los resultados en las escalas del Inventario de Minnesota para Personalidad Multifásica (MMPI), de Hipocondriasis (Hy), de Histeria (Hs) y de Esquizofrenia (Sc) fueron significativamente más elevados en el grupo de pseudoepilépticos que en los otros sujetos. En total los pseudoepilépticos mostraron el perfil del MMPI que, con frecuencia, se ve en la histeria de conversión. Para clasificar los enfermos correctamente, en el 80-90% de los casos se usaron tres reglas derivadas de los perfiles del MMPI. En la evaluación realizada por el Inventario Psicosocial de Ataques de Washington los problemas psicosociales entre los enfermos con ataques pseudoepilépticos fueron más severos en ciertas áreas y parecían reflejar problemas familiares existentes previamente y un manejo inapropiado de sus trastornos.

(A. Portera Sanchez, Madrid)

## ZUSAMMENFASSUNG

EEG/CCTV-Langzeitmonitoring wurden als diagnostisches Hilfsmittel angewandt, 25 Patienten mit pseudoepileptischen Anfällen zu identifizieren und zu charakterisieren. Eine gleiche Gruppe von Patienten mit Epilepsie diente zur Überprüfung der Prozedur. Die Gruppen unterschieden sich nicht hinsichtlich Intelligenz, neuropsychologischer Beeinflussung oder der Häufigkeit möglicher ätiologischer Faktoren. Die Scores der Minnesota multiphasischen Persönlichkeitstests (MMPI) und die Hypochondrie- (Hy), Hysterie- (Hs) und Schizophrenie- (Sc) Skalen waren signifikant höher für die pseudoepileptische Gruppe als für die anderen. Im ganzen bot die erste Gruppen ein MMPI-Profil, wie es häufig in der Konversionsform der Hysterie gesehen wird. Drei Regeln, von den MMPI-Profilen abgeleitet, wurden benutzt, um die Patienten in 80 bis 90% korrekt zu klassifizieren. Wie sich beim Washington Psychosocial Seizure Inventory zeigte, waren psychosoziale Probleme bei Patienten mit pseudoepileptischen Anfällen in bestimmten Bereichen schwerer und schienen frühe familiäre Probleme und die inadäquate Verarbeitung ihrer Störungen widerzuspiegeln.

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