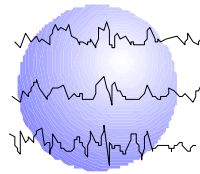


PREDICTORS OF NON-EPILEPTIC SEIZURES IN AN INPATIENT EPILEPSY PROGRAM

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Please consider this information to be preliminary findings.

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REVISED ABSTRACT

RATIONALE: The differentiation of patients with psychogenic non-epileptic seizures (NES) and epileptic seizures (ES) is very important. The aim of this study was to identify variables that best predict patients ultimately diagnosed with NES or ES via long-term video EEG monitoring. The variables found to best predict clinical group status could then be emphasized in the clinical evaluation of patients presenting with seizures.

METHODS: The two groups (NES: n = 35; ES: n = 36) received their respective diagnoses following a multidisciplinary inpatient video EEG monitoring evaluation and for the NES group, exclusion of a physiological etiology. Demographic (age, gender, education), historical (age of seizure onset, past psychiatric history, past history of sexual and/or physical abuse, past history of neurologic illness/trauma other than seizures), and objective psychological variables (general intellectual/memory status and a personality measure of conversion symptoms), were obtained and compared between the two groups using nonparametric, univariate, and multivariate statistical procedures.

RESULTS: The two groups were comparable in terms of age, gender, education, Full Scale IQ, and neurological history. When compared to the ES group, the NES patients demonstrated a significantly older age of seizure onset ($p < .001$), higher proportion of cases with a past history of psychiatric illness ($p < .01$) and sexual/physical abuse ($p < .001$), and a higher obtained score on the Conversion subscale of the Personality Assessment Inventory (SOM-C; $p < .001$). A stepwise logistic regression analysis using the entire variable set was then undertaken to ascertain which of these best predicted group membership. Results revealed age of seizure onset ($p = .001$), a past history of sexual/physical abuse ($p = .001$), SOM-C ($p < .05$), and the general memory index (GMI) of the WMS-III ($p < .05$) to all significantly contribute to the prediction of NES. The overall correct classification rate using the four predictors was 87.3%. Odds-ratio calculations of these data revealed that patients who present to an inpatient epilepsy service with an older age of seizure onset, a history of sexual and/or physical abuse, a SOM-C elevation, and a generally average GMI score are nearly 15 times more likely to be ultimately diagnosed with psychogenic NES rather than ES.

CONCLUSION: We found four rather disparate variables that when taken together are significantly associated with psychogenic NES. Age of seizure onset, history of sexual/physical abuse, memory status, and a somatoform profile configuration on the PAI are variables that appear to be useful in contributing diagnostic clarity to patients presenting for evaluation of seizures.

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BACKGROUND

The differentiation of patients with psychogenic non-epileptic seizures (NES) and epileptic seizures (ES) is crucial for accurate diagnosis and treatment.

Video EEG monitoring is the established standard for the diagnosis of NES.

A subset of patients admitted to an inpatient epilepsy monitoring unit will not have their typical events recorded, which makes diagnosis more problematic.

Therefore, clinicians must look to other features or clinical signs that will help clarify a NES vs. ES diagnosis.

Previous research has identified a number of historical and clinical variables that occur disproportionately in persons with NES as compared to ES including prototypical profile configurations on personality testing, history of sexual or physical abuse, generally normal neuropsychological functioning, higher prevalence of psychopathology, etc.

METHODS

Subjects were 35 NES and 36 ES patients evaluated on the inpatient epilepsy unit at United Hospital in St. Paul, MN. The patients were diagnosed either as psychogenic NES or ES based upon long term video EEG monitoring and other clinical data. See Table 1 for demographics and other patient characteristics.

All patients were administered neuropsychological and personality testing as part of a routine inpatient assessment. Parametric and nonparametric tests were used to compare the two groups on the variables of interest. Logistic regression analysis was conducted to determine the most important predictors of NES as well as the classification accuracy based upon those predictors.

RESULTS

1. The two groups were comparable in terms of age, gender, education, FSIQ, general memory capacity (GMI), and presence of neurological history other than seizures (Table 1).
2. Statistically significant differences were found between the NES and ES groups on age of seizure onset ($p < .001$), history of sexual or physical abuse ($p < .001$), Conversion subscale of the PAI (SOM-C; $p < .001$), and history of previous psychiatric diagnosis ($p < .01$) (Table 1, Figure 1).
3. Stepwise logistic regression analysis using the entire variable set revealed age of seizure onset ($p = .001$), past history of sexual/physical abuse ($p = .001$), SOM-C ($p < .05$), and the WMS-III GMI ($p < .05$) to all significantly contribute to the prediction of NES.
4. The overall correct classification rate, sensitivity, and specificity using the above four predictors was 87.3%, 87.5%, and 87.1, respectively (Table 2).
5. Odds-ratio calculations of these data revealed that patients who present to an inpatient epilepsy service with an older age of seizure onset, a history of sexual and/or physical abuse, a SOM-C elevation, and generally average learning/memory scores are nearly 15 times more likely to be ultimately diagnosed with psychogenic NES rather than ES.

CONCLUSIONS

Persons diagnosed with psychogenic NES via video EEG monitoring have an older age of seizure onset, a greater frequency of sexual/physical abuse and psychiatric illness, and a more somatoform profile configuration on personality testing when compared to persons diagnosed with epilepsy.

NES and ES patients show no significant differences in age, gender, education, IQ, general memory capacity, or neurologic history other than seizures.

Four rather disparate variables (age of seizure onset, history of sexual/physical abuse, general memory capacity, and the Conversion subscale of the PAI) when taken together best predict NES group membership to a great degree of accuracy (87%).

These variables may be useful in contributing diagnostic clarity to patients presenting for evaluation of seizures especially when the target events are not recorded on video EEG.

Table 1

GROUP CHARACTERISTICS

	NES	ES
n	35	36
Age ¹	36.4	34.4
Gender (% Male)	26%	28%
Education ¹	13.2	13.5
Age of Seizure Onset ^{1**}	30.1	16.9
History Sexual/Physical Abuse(%)**	74.3	27.8
History Neuro Dx (%)	57.1	50.0
History Psychiatric Dx (%)*	82.9	47.2
WAIS-III FSIQ ¹	93.3	95.5
WMS-III GMI ¹	99.1	93.0
PAI SOM-C ^{1**}	73.1	57.6

¹ = Mean

* p < .01

** p < .001

FSIQ = Full Scale IQ

GMI = General Memory Index

SOM-C = PAI Conversion Subscale

Figure 1

PAI Group Profiles

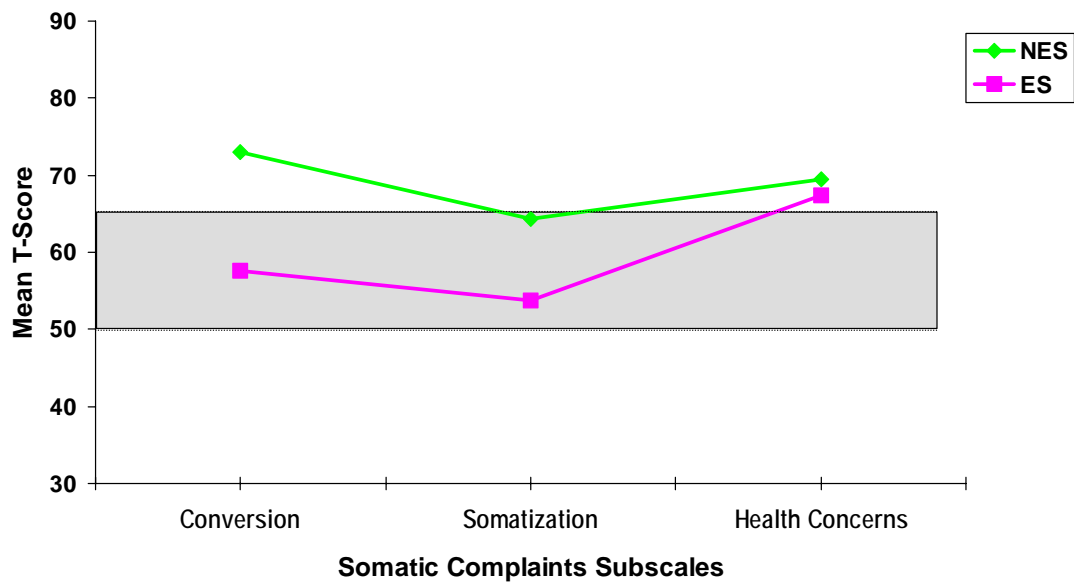


Table 2 CLASSIFICATION TABLE FROM LOGISTIC REGRESSION*

		Predicted Group Membership	
		NES	Epilepsy
Actual Group Membership	NES	28	4
	Epilepsy	4	27

Sensitivity = 87.5%

Specificity = 87.1%

Overall Correct Classification = 87.3%

***Based on age of seizure onset, history of sexual/physical abuse, SOM-C, and GMI as predictors.**