Does the primary literature provide support for clinical signs used to distinguish psychogenic nonepileptic seizures from epileptic seizures?

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CRD summary
This review found good evidence to support a range of clinical signs for distinguishing psychogenic non-epileptic seizures from epileptic seizures. The authors' classification of good evidence was based on only two controlled studies that were mostly small and appeared to have methodological limitations. The conclusions should be interpreted with caution.

Authors' objectives
To determine whether signs said to distinguish between psychogenic non-epileptic seizures (PNES) and epileptic seizures were supported by the evidence.

Searching
MEDLINE was searched from 1980 to June 2009 for English-language studies. Search terms were reported. Reference lists of included studies were screened.

Study selection
Recent review papers were used to determine a list of signs commonly used to distinguish PNES from epileptic seizures; a full list was provided in the paper. Studies that assessed the accuracy of one or more of these signs (index test) against video-EEG (reference standard) in adults were eligible for inclusion. Studies had to report ictal signs for all included patient groups. Case reports were excluded.

All studies included patients with PNES and some studies included a control group with epileptic seizures. Most studies excluded events with subjective phenomena. All studies were carried out in specialised epilepsy centres on adult patients with refractory seizures of spells that presented a diagnostic problem.

The authors did not state how studies were selected for inclusion.

Assessment of study quality
Study quality was assessed using the 14-item QUADAS criteria. Only studies that fulfilled at least eight QUADAS criteria were included in the analysis.

The authors did not state how many reviewers performed the quality assessment.

Data extraction
Data were extracted on sensitivity and specificity. Data were extracted at both the event and patient level.

The authors did not state how data were extracted.

Methods of synthesis
A narrative synthesis was presented. Individual signs were considered to be well supported by data if at least two controlled studies proved their usefulness and data from other studies were supportive.

Results of the review
Thirty-four studies were included. The total number of patients was unclear but, where reported, ranged from 12 to 160 across studies in patients with PNES and 11 to 161 with epileptic seizures. Total number of seizures was unclear but, where reported, ranged to 31 to 280 events in patients with PNES and from 25 to 261 in patients with epileptic seizures.
seizures. Only 22 studies included a control group with epileptic seizures. Incorporation bias was a potential source of bias in all studies as the ictal signs were considered when interpreting the video-EEG. Only four studies reported that the person who interpreted the ictal signs was blind to the results of the EEG.

There was good evidence that the following signs can be used to rule in PNES: long duration (no data reported; seven controlled studies), fluctuating course (sensitivity 47% to 88%, specificity 96% to 100%; two controlled studies), asynchronous movements (sensitivity 9% to 96%, specificity 93% to 100%; three controlled studies), pelvic thrusting (sensitivity 1% to 44%, specificity 92% to 100%; six controlled studies), side-to-side hear or body movements (sensitivity 15% to 63%, specificity 92% to 100%; five controlled studies), closed eyes (sensitivity 34% to 96%, specificity 74% to 100%; five controlled studies), ictal crying (sensitivity 4% to 37%, specificity 100%; four controlled studies) and memory recall (sensitivity 63% to 88%, specificity 90% to 96%; two controlled studies).

There was good evidence that the following signs can be used to rule in epileptic seizures: occurrence from sleep (sensitivity 31% to 59%, specificity 100%; three controlled studies), postictal confusion (sensitivity 61% to 100%, specificity 84% to 88%; two controlled studies) and stertorous breathing (sensitivity 61% to 91%, specificity 100%; three controlled studies).

There was insufficient evidence on gradual onset, non-stereotyped events, flailing or thrashing movements, opisthotonus, _arc en cercle_, tongue biting and urinary incontinence.

**Authors' conclusions**

There was good evidence from the literature to suggest that long duration, fluctuating course, asynchronous movements, pelvic thrusting, side-to-side head or body movement, closed eyes during the episode, ictal crying and memory recall were signs that distinguished PNES from epileptic seizures. Occurrence from sleep and postictal confusion and stertorous breathing favour epileptic seizures were also well supported by the literature.

**CRD commentary**

The review question was clear and supported by defined inclusion criteria. The literature search was limited to one electronic database and no specific attempts were made to locate unpublished data. It was, therefore, possible that relevant studies were missed and there was potential for language and publication biases. No details of the review methods were reported and so it was not possible to determine whether appropriate steps were taken to minimise and errors. Study quality was assessed using appropriate criteria, but only limited details of the results of this were reported. A narrative synthesis appeared appropriate given the small number of studies that assessed each individual sign and the apparent heterogeneity in estimates of sensitivity. It should be noted that the authors' classification of good evidence was based on only two controlled studies, which were mostly small and appeared to have methodological limitations. Although these signs generally had good specificity, sensitivity was generally low and heterogeneous. The authors conclusions should be interpreted with caution.

**Implications of the review for practice and research**

**Practice:** The authors stated that the diagnosis of PNES required careful integration of history, ictal signs and other clinical and investigational information and should not be driven by any one clinical sign alone.

**Research:** The authors stated that future studies should be prospective, evaluate well-defined clinical signs, include all types of event and include independent assessors blinded to the video-EEG recording.

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**Bibliographic details**

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.