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REVIEW

The diagnostic value of urinary incontinence in the differential diagnosis of seizures

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ABSTRACT

Purpose: Urinary incontinence may occur both in epileptic seizures (ES) and in non-epileptic events (NEE) such as psychogenic nonepileptic events (PNEEs) and syncope. A comprehensive search of the literature to determine the accuracy of this physical finding and its prevalence in epileptic seizures and syncope is still lacking.

To undertake a systematic review to determine sensitivity, specificity and likelihood ratios (LR) of urinary incontinence in the differential diagnosis between ES and NEEs (including syncope and PNEEs).
Methods: Studies evaluating the presence of urinary incontinence in ES and NEEs were systematically searched. Sensitivity, specificity, positive and negative likelihood ratio (pLR, nLR) of incontinence were determined for each study and for the pooled results.
Results: Five studies (221 epilepsy patients and 252 subjects with NEEs) were included. Pooled accuracy measures of urinary incontinence (ES versus NEEs) were: sensitivity 38%, specificity 57%, pLR 0.879 (95% CI 0.705–1.095) and nLR 1.092 (95% CI 0.941–1.268). For each comparison (epileptic seizures versus NEEs; ES versus syncope; ES versus PNEEs), pooled accuracy measures for urinary incontinence showed a statistically not significant pLR (the 95% CI of the pooled value included 1, and the LR value of 1 has no discriminatory value).
Conclusions: A pooled analysis of data from the literature shows that urinary incontinence has no value either in the differential diagnostic between ES and syncope/PNEEs. Systematic reviews with pooled analyses of data from the literature allow an increase in statistical power and an improvement in precision, representing a useful tool to determine the accuracy of a certain physical finding in the differential diagnosis between ES and other paroxysmal events.

1. Introduction

Paroxysmal episodes of loss of consciousness are rarely witnessed by physicians, and the differential diagnosis between epileptic seizures (ES) and other episodes is usually based on the history. However, even with an accurate description by witnesses, the diagnosis may be difficult and often remains uncertain.[1] In the differential diagnosis of paroxysmal episodes of loss of consciousness one should mainly consider ES, syncope and psychogenic nonepileptic events (PNEEs).

The diagnosis relies mainly on an accurate history or on a description of the event given by witnesses, and the presence or absence of physical signs may provide additional information to support or rule out the initial diagnostic suspicion. In previous systematic reviews we assessed the diagnostic value of tongue biting in the differential diagnosis between seizures and seizures and between PNEEs and seizures, concluding that in both cases the presence of tongue biting supports the diagnosis of epileptic seizures.[2,3]

The presence of urinary incontinence is an additional clinical sign which may occur both in patients with seizures and in subjects with non-epileptic events (NEEs). A comprehensive search of the literature to determine the accuracy of this physical finding

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(with special regards to its positive likelihood ratio) in the differential diagnosis between ES and NEEs has not yet been performed.

In this study we therefore aimed to undertake a systematic review to evaluate sensitivity, specificity and likelihood ratios (LR) of urinary incontinence in the differential diagnosis between epileptic seizures and NEEs (syncope or PNEEs).

2. Methods

Our aim was to critically and systematically evaluate the literature to evaluate the sensitivity, specificity, positive LR (pLR) and negative LR (nLR) of urinary incontinence in the differential diagnosis between epileptic seizures and NEEs (syncope or PNEEs).

We included prospective and retrospective studies comparing the presence of incontinence between patients with ES (all types) and patients with NEEs. No race or gender restrictions were applied. Studies could rely on historical reports of incontinence from patients, on direct examination of patients who presented to the emergency unit following a seizure, or on video-EEG monitoring evaluation.

Studies not reporting the frequencies of occurrence of urinary incontinence for each patient group (expressed as per patient or per event frequencies) were excluded.

The MEDLINE (accessed by Pubmed; 1966–May 2012) electronic database was searched using the following medical subject headings (MeSH): "Epilepsy", "Seizures" and "Urinay incontinence", as well as following free terms, combined in multiple search strategies with Boolean operators in order to find relevant articles: "incontinence", "incont", "epileps*", "epilept*", "seizur*" (see "Appendix"). Abstracts were reviewed to determine which full-text articles should be retrieved. In addition, reference lists from each of the articles that were included in the review were manually searched for papers meeting the inclusion criteria and not identified through MEDLINE. Papers were eligible for inclusion if they assessed urinary incontinence, if the frequencies of occurrence of ictal signs were reported for all patient groups or if it was possible to calculate them from the given data. Case reports were not included. Studies were excluded if they were conducted on a paediatric population.

In order to provide a transparency of results as great as possible, and to allow readers to reproduce the methodology we adopted, and considering that in abstracts many methodological aspects are not declared and results are often synthesized, only in-extenso in extenso papers and articles already published were considered eligible for inclusion.

The methodological quality of each study was evaluated. The methodological quality of each study was evaluated using the following criteria[4]: (1) independent, blind comparison with a valid test ("gold" or reference diagnostic standard, i.e. presence of urinary incontinence assessed by a physician or reported by patients); (2) patient sample including an appropriate spectrum of patients to whom the diagnostic test can be applied in clinical practice; (3) results of the physical sign being evaluated (i.e. presence of urinary incontinence) not influencing the decision to

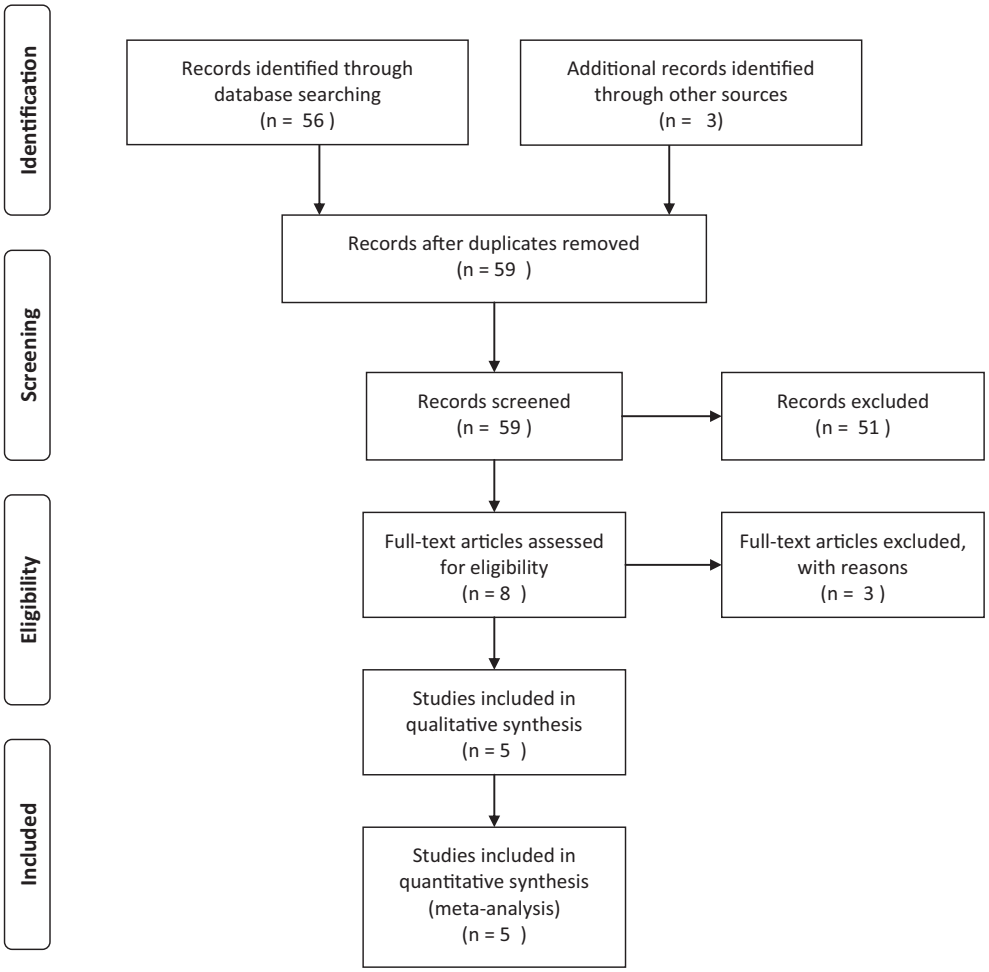

Fig. 1. Flowchart of study selection and inclusion.