Behavioural treatments for non-epileptic attack disorder (Review)

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[Intervention Review]

Behavioural treatments for non-epileptic attack disorder

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ABSTRACT

Background

Psychogenic non-epileptic seizures (NES) have the outward appearance of epilepsy in the absence of physiological or electroencephalographic correlates. Non-epileptic seizures can occur in isolation or in combination with epileptic seizures. The development and maintenance of non-epileptic seizures has been well documented and there is a growing literature on the treatment of NES which includes non-psychological (including anti-anxiety and antidepressant pharmacological treatment) and psychological therapies (including cognitive behavioural therapy (CBT), hypnotherapy and paradoxical therapy). Various treatment methodologies have been tried with variable success. The purpose of this Cochrane review was to establish the evidence base for the treatment of NES.

Objectives

To assess whether treatments for NES result in a reduction in frequency of seizures and/or improvement in quality of life, and whether any treatment is significantly more effective than others.

Search methods

We searched the Cochrane Epilepsy Group's Specialised Register (September 2005), the Cochrane Central Register of Controlled Trials (CENTRAL) (*The Cochrane Library* Issue 3, 2005), MEDLINE (1966 to July 2005), and PsycINFO (1806 to July 2005). No language restrictions were imposed. We checked the reference lists of retrieved studies for additional reports of relevant studies

Selection criteria

Randomised or quasi-randomised studies were included that assessed one or more types of psychological or non-psychological interventions for the treatment of NES. Studies of childhood NES were excluded from our review.

Data collection and analysis

Three review authors independently assessed the trials for inclusion and extracted data. Outcomes included reduction in seizure frequency and improvements in quality of life.

Main results

Three small studies met our inclusion criteria and were of poor methodological quality. Two assessed hypnosis and the other paradoxical therapy. There were no detailed reports of improved seizure frequency or quality of life outcomes, and these trials provide no reliable evidence of a beneficial effect of these interventions.

Authors' conclusions

In view of the methodological limitations and the small number of studies, we have no reliable evidence to support the use of any treatment including hypnosis or paradoxical injunction therapy in the treatment of NES. Randomised studies of these and other interventions are needed.

PLAIN LANGUAGE SUMMARY

Behavioural treatments for non-epileptic attack disorder

There is no reliable evidence to support the use of any interventions for people with non-epileptic seizures.

There has been extensive investigation of the aetiology of non-epileptic seizures. However, the literature on the treatment of such seizures is less well defined. We conducted a review of randomised controlled trials of interventions for non-epileptic seizures. We found only three studies and from these no conclusive results can be drawn.

BACKGROUND

Much research has been devoted to the aetiology of non-epileptic seizures. Significant links have been found between certain life events and the occurrence of non-epileptic seizures. In particular there have been consistent findings of co-occurrence of experiences of abuse in childhood or early adulthood and the development of non-epileptic events (Francis 1999a; Reilly 1999).

Psychological factors such as anxiety, stress, anger and other emotions as well as mental tasks and thoughts (Francis 1999b) can trigger an attack, as can physiological states such as over-exertion and pain (Stone 2004). It is on the basis of such studies that much literature has evolved regarding potential treatments. Various psychological and non-psychological interventions such as Cognitive Behaviour Therapy (CBT), eye movement desensitization and reprocessing, and neurofeedback have been used alone or in combination in the treatment of non-epileptic seizures to reduce attack frequency and improve quality of life. Potential treatments include the following.

Eye movement desensitization and reprocessing (EMDR)

Chemali 2004 reported on the use of EMDR in the treatment of psychogenic seizures. This was a single case study involving a 48 year old female with post-traumatic stress disorder and psychogenic seizures that lasted for many hours. After 18 months of EMDR treatment (weekly sessions) the patient was described as 'event-free'. Follow up three months later confirmed she was still seizure free.

Group psychoeducation

An open-ended group psychotherapy program was given to 10 patients with NES by Zaroff 2004. This program included a 'disorder-specific psychoeducation treatment component'. Only 7 of the 10 completed the majority of psychoeducational sessions. Seizure frequency was measured pre- and post-treatment. Four patients had no change in seizure frequency but three of these were seizure free at treatment initiation. Two patients had a reduction in seizure frequency and one an increase. The authors concluded that there was a non-significant trend towards improved quality of life (as measured by the QOLIE-31(Quality Of Life In Epilepsy) questionnaire). They also note that seizure remission following diagnosis supports the hypothesis that education about the disorder is effective in its treatment.

Neurofeedback plus psychotherapy

Swingle 1998 trained three patients presenting with non-epileptic events in the use of electroencephalographic (EEG) feedback between one and three times a week. Neurofeedback therapy is used in an effort to reduce general levels of arousal. The hypothesis is that high arousal levels are implicated in the development and or maintenance of attacks and reducing these levels may have an impact on attack frequency and/or severity. This neurofeedback therapy was used to reduce the EEG theta/sensorimotor rhythm (SMR) ratio. This treatment was used in conjunction with psychotherapy. The aim of the treatment protocol was to reduce the ratio of theta to sensorimotor rhythm (SMR). The author concluded that reductions in the theta/SMR ratio brought about by neurofeedback were associated with reductions in seizure behaviour. Swingle also added the use of EEG feedback training. He commented on the absence of a control group and the limitations this puts on the generalisability of his findings.

Psychotherapy

In their retrospective study Aboukasm 1998 divided 61 patients into four groups: (a) those receiving comprehensive epilepsy program (CEP) psychotherapy; (b) those only under CEP neurologist care; (c) those receiving non-CEP psychotherapy; and (d) those with no feedback or intervention. There were no details about the type of psychotherapy used. The authors reported that group D had significantly less desirable NES clinical outcomes than the other three groups and less improvement in QOL. They concluded that psychotherapy and feedback by CEP professionals experienced in epilepsy and NES was beneficial compared to other or no interventions.

Cognitive behavioural psychotherapy

In a paper by Rusch 2001 psychotherapeutic intervention focused on one of six symptom patterns: acute anxiety/panic; impaired affect regulation and interpersonal skills; somatisation/conversion; depression; post-traumatic stress disorder; and reinforced behaviour pattern. Patients were treated according to the symptom pattern e.g. those in the acute anxiety/panic group received cognitive therapy with exposure; those in the reinforced behaviour pattern group received behavioural management strategies involving family or significant other participation to directly modify reinforcement patterns. Twenty-six of 33 patients completed treatment and of those, 21 were event-free by the end of treatment; the remaining five showing a significant reduction in frequency.

Combined interventions

Psychotherapy, occupational therapy and minimal attention within in-patient setting

McDade 1992 diagnosed 18 patients in an in-patient setting with NES; nine were solely experiencing NES and nine were experiencing a combination of NES and epilepsy. This group of clients poses a significant management problem as often the treating physician, the client and the family may have difficulty differentiating between seizures and non-epileptic events. Individual programmes were developed for each patient, but each programme included psychotherapy (orientation not specified), occupational therapy, and minimal attention being paid to the seizures. Sixteen of the patients completed the programme. Eight became seizure free, three had occasional NES and five were unchanged. At one year follow up, seizure patterns were reported to be similar and patients were also reporting an improvement in social functioning. The authors conclude that prognosis for NES is good when management takes place in a specialist unit with a multi-disciplinary approach and a team familiar with this patient group.

Confrontation with diagnosis, psychotherapy and continuing clinical care

In this study, the authors described outcome in 50 patients (including adults and children) with NES (Buchanan 1993). They divided their group into those with acute (18) and those with chronic NES (32). In the acute group direct communication of the diagnosis was the only intervention for 12/18, six received formal psychotherapeutic support, one had barbiturates withdrawn, and one had family therapy. In terms of outcome, 15/18 (83%) were seizure free at follow up and the remaining three had a marked improvement. The chronic group also had various psychiatric/psychological problems such as personality disorder, anxiety disorder, abnormal illness behaviour, major depression, somatisation disorder and Munchausen's syndrome. In this group various management approaches were used and some patients had more than one approach which included confrontation with the diagnosis, exploratory formal and/or supportive psychotherapy, continuing clinical care and firm management with limit setting. With regard to outcome in the chronic group, 9/32 were seizure free, 11/32 were significantly improved and 8/32 had no change at all.

Operant conditioning

Betts 1992a report on a group of 128 patients diagnosed with NES over a five year period (46 had the additional diagnosis of epilepsy, 82 had NES only). A variety of management strategies were offered; these included anxiety management, abreaction, psychotherapy/counselling, family therapy and medication (major tranquillizers). Most patients received more than one treatment and almost all were treated by operant conditioning. This was described by the authors as attempting to prevent rewarding of seizure activity by ignoring it and deliberately rewarding non-seizure activity by verbal praise and encouragement. At discharge it was reported that 63% (76) of patients no longer had NES and 24% (29) had a partial resolution the remainder had either no change or were worse. At two year follow up, seizures had returned in 34% (41) or partially returned 14% (17) while 31% (37 were still seizure free. In 8% (10) the diagnosis of NES was found to be incorrect. The authors comment that inpatient treatment results may be misleading. Once the patient returns to the community and the stresses that may have led to the attack disorder, NES may return.

Retrospective follow-up studies

An exploration of reaction to diagnosis and treatment subsequently offered was undertaken by Riaz 1998. They retrospectively collected data regarding 91 patients admitted to an inpatient facility. Of those 25 were diagnosed with NEAD and 15 of these were included in the final analysis. The authors also collected follow-up data by semi-structured interviews. They reported that a comparison of seizure frequency from admission to follow up (one to two years) indicated 27% of the sample were still seizure free, 40% had a greater than 50% reduction, and 13% had experienced an increase in seizure frequency. With regard to treatment, 20% had been seen by a psychiatrist, 40% had been followed up in epilepsy clinics and 40% had received no contact with specialist services. Unfortunately, this paper does not indicate whether those

who became seizure free were mainly those who had received some form of intervention.

OBJECTIVES

To assess whether treatments for NES result in a reduction in frequency of seizures and/or improvement in quality of life, and whether any treatment is significantly more effective than others.

METHODS

Criteria for considering studies for this review

Types of studies

Randomised controlled trials (RCTs) or quasi-randomised studies (e.g. where randomisation is according to the day of the week or date of birth). The studies may be single or double blind or unblinded.

Types of participants

Adult male or female with any type of non-organic non-epileptic seizures, with or without learning disabilities.

Types of interventions

Any psychological or behaviour modification therapies such as use of cognitive behaviour therapy, relaxation therapy, bio-feedback, counselling, hypnotherapy, conditioning, physical therapies, massage, aromatherapy.

Exclusion criteria

Studies restricted to children.

Types of outcome measures

Primary outcome measures

Seizure reduction

(a) Fifty per cent or greater reduction in seizure frequency.
(b) Seizure free.
(c) Percentage change in seizure frequency.

Secondary outcome measures

(a) Quality of life (QOL).
(b) Seizure severity - provided a standardized and validated scale is used.

Search methods for identification of studies

We searched the Cochrane Epilepsy Group's Specialised Register (12 September 2005). This register contains reports of trials identified from regular searches of the Cochrane Central Register of Controlled Trials (CENTRAL) and of MEDLINE. Relevant reports are also identified by handsearching selected journals and conference proceedings.

In addition, we carried out searching as follows:

Electronic databases

We searched the following databases using the strategy described in Appendix 1.There were no language restrictions.

(1) The Cochrane Central Register of Controlled Trials (CENTRAL) (*The Cochrane Library* Issue 3, 2005)

(2) *MEDLINE (Ovid)* (1966 to July 2005)

(3) PsycINFO (Ovid) (1806 to July 2005)

References from published studies

We reviewed the reference lists of retrieved studies to search for additional reports of relevant studies.

Data collection and analysis

Trials were independently assessed for inclusion by five review authors (JB, GB, AA, NB, LG) with disagreements resolved by mutual discussion.

The same five review authors independently extracted the following data and again any differences of opinion were resolved by mutual discussion:

(1) Study methods:
(a) design (e.g. parallel or crossover design);
(b) randomisation method (allocation concealment and list generation);
(c) blinding method;
(d) quality of allocation concealment (A, adequate; B, unclear; C, inadequate).
(2) Participants:
(a) number (total/per group);
(b) age and sex distribution;
(c) exclusions withdrawal;
(d) type of seizures;
(e) duration of attack disorder;
(f) aetiology of attack disorder;
(g) presence or absence of learning disability.
(3) Type of intervention and control.
(4) Duration of follow up.
(5) Outcome data (as described earlier).

We intended to assess the results of each intervention separately. As only three randomised controlled clinical trials were found that used differing methodologies, no meta-analysis was undertaken but results for individual studies are given in tables.

RESULTS

Description of studies

See: Characteristics of included studies; Characteristics of excluded studies.

Hypnosis and non-epileptic seizures

One study investigated the effects of hypnosis on non-epileptic seizures (Moene 2002). This study included 45 adult in-patients with conversion disorder. Seven experienced paroxysmal myoclonic outbursts and eight had seizures or convulsions. Twenty four were allocated randomly to the experimental group and 21 to the control group. The average duration of conversion disorder was 3.9 years (range two months to 22 years; standard deviation [SD] 4.5 months). Forty per cent (18) of the 45 had acute onset (within three days). Sixty two per cent (28) (an undisclosed proportion of whom had acute onset) developed conversion symptoms in connection with a previous physical complaint or affliction in the relevant part of the body. Thirty-two (72.7%) of the patients used medication (benzodiazepines (43.2%), medication for somatic complaints (45.5%) and painkillers (44.4%) most frequently). No discussion of withdrawal of medication or otherwise was included.

Patients in both treatment and control groups followed a group therapy programme with the aim of increasing problem-solving skills. This programme consisted of group psychotherapy, social skills training, formulating and evaluating treatment goals, creative therapy and sports. In addition, conversion patients also had physiotherapy, individual exercise sessions and bed rest. The experimental group had the addition of hypnotic treatment. This involved one preparatory session followed by eight weekly sessions lasting one hour. Part of this treatment involved the patients learning self-hypnosis and they were instructed to practice each day for 30 minutes. In the control group, instead of hypnosis, a treatment aimed at optimising non-specific or common therapy factors was implemented. This involved a preparatory session followed by eight weekly sessions lasting one hour.

The primary outcome measure used was the Video Rating Scale for Motor Conversion Symptoms (VRMC). Follow up in this study was eight months after pre-treatment assessment.

A further study by Moene 2003 included 44 adult outpatients with conversion disorder (motor type) or somatisation disorder (with motor conversion symptoms). Of the 44, six experienced paroxysmal myoclonic outbursts and two had seizures or convulsions. Twenty were randomly allocated to the treatment group and 24 to the waiting list control group. The treatment group received one preparatory session followed by 10 weekly sessions. Two hypnotic strategies were used: (1) direct symptom alleviation used suggestions designed to alter conditioned cues to motor symptoms; (2) emotional expression/insight involved age regression to explore factors implicated in the development of the symptoms. Self hypnosis was also taught and patients were asked to practice the symptom alleviation strategies for 30 minutes a day. A waiting list control group was used.

Average duration of conversion disorder was 3.7 years (range two months to 16.7 years; SD 4.7 months). In terms of onset, 37.2% (16) patients had acute onset (within three days) and 47.8% (21) developed conversion symptoms in connection with a previous physical complaint or affliction in the relevant part of the body. Twenty-one (48.8%) of the patients used medication (benzodiazepines (14%), medication for somatic complaints (30.2%) and painkillers (34.8%) most frequently). No discussion of withdrawal of medication or otherwise was included.

Primary outcome measure used was the VRMC. Follow up for the treatment group was at six months after their tenth session. No follow up was arranged for the waiting list control group.

It is noted that preliminary data on eight adults with motor conversion symptoms (one described as having pseudo-epileptic seizures) was published by Moene in 1998 (Moene 1998).

Paradoxical intention and non-epileptic seizures

We found one randomised controlled clinical trial investigating the effects of paradoxical intention on non-epileptic seizures (Ataoglu 2003). This study included 30 adults with conversion disorder, specifically pseudoseizures. Fifteen were randomly allocated to the experimental group and 15 to the control group after exclusions for abnormal EEG, organic disease, previous psychiatric treatment etc. In the experimental group, patients were hospitalised and given two paradoxical intention treatment sessions per day. During sessions, patients were encouraged to imagine anxiety provoking situations and/or experiences. The aim was to help the patients to re-experience their traumas and experience their conversion attacks. After three weeks, patients were discharged. Three weeks post discharge, a re-assessment took place and comparisons of anxiety and conversion scores were made. In the control group, patients were prescribed diazepam as outpatients (5 to 15mgs) they were given appointments at 10, 20, 30, and 45 days to review their progress and also were reviewed at the end of treatment for anxiety and conversion symptoms.

The overall mean duration of conversion disorder for the whole sample was 42 days (experimental group 34 days; control group 48 days). There was no discussion of medication use in these groups. The aetiology was not detailed; however anxiety provoking situations and experiences, and traumatic events were mentioned. The primary outcome measure was anxiety score as measured by the Hamilton Rating Scale for Anxiety (HRSA). Follow up in this study was three weeks after the study finished. The study duration was six weeks therefore follow up was approximately two months after the start of the study.

It is noted that an earlier account of this research was published

by Ataoglu, in 1998 (Ataoglu 1998).

Risk of bias in included studies

Hypnosis and non-epileptic seizures

Moene 2002 used block randomisation (block sizes: 3 x 4, 2 x 6, 2 x 8, 2 x 4 and 2 x 2) to allocate patients to treatment conditions. This was concealed from the therapist and assessors. The assessors rating the outcomes were blinded to treatment allocation. Further details of randomisation or blinding method are not provided. In terms of methodological weaknesses, of the 45 patients with conversion symptoms, eight were reported to have seizures or convulsions and seven were reported to have paroxysmal myoclonic outbursts, however patients could have more than one symptom so the exact number is unclear. There was no detail regarding seizure frequency or change in seizure frequency, nor were there measures of quality of life or seizure severity.

Moene 2003 used block randomisation (unspecified) to assign patients to experimental (hypnosis) or control (waiting list) conditions. The assessors rating the outcomes were blinded to treatment allocation. No further details of randomisation or blinding method were provided. In terms of methodological weaknesses, only two of the patients with conversion symptoms were documented as having seizures or convulsions, although six were reported to have paroxysmal myoclonic outbursts (patients may have more than one symptom so the exact number is unclear). There was no detail regarding seizure frequency or change in seizure frequency, nor were there measures of quality of life or seizure severity.

Paradoxical intention and non-epileptic seizures

In this study (Ataoglu 2003), random allocation was effected by a computerised system; no further information is provided. All patients were assessed by a psychiatrist who was blinded as to the patients' group throughout the study. There were some methodological weaknesses in the study design: absence of a placebo control group and the two groups received their interventions in different settings - inpatient and outpatient.

Effects of interventions

Hypnosis and non-epileptic seizures

Moene 2002 provided no results specific to non-epileptic seizures. It is stated that frequency and duration of seizures was noted by staff and patients throughout the study. From this they calculated the mean percentage change in frequency and duration which was converted to a representative score on the VRMC rating scale. However, none of these scores were provided in the paper.

The authors analyses were time and condition by time interactions. Their outcome measures were the VRMC, SCL-90 (Symptom Checklist-90; Dutch version) a self report measure of psychoneuroticism, the ICIDH (International Classification of Impairments, disabilities and Handicaps) subscale for physical activities), and the ICIDHP (the perceived problems subscale). The authors reported significant symptom reduction in patients with a conversion disorder of the motor-type; however this was independent of the treatment condition. They reported no significant condition effects and no significant condition-by-time interactions for any of the outcome measures. However, a significant main effect for time was reported on all of the outcome measures (VRMC, $F(2, 82) = 28.07$, $P = 0.001$; SCL-90, $F(3, 126) = 3.37$, $P = 0.05$; ICIDH, $F(3, 123) = 12.76$, $P = 0.000$; ICIDHP, $F(3, 123) = 8.97$, $P = 0.000$). The authors concluded that the addition of hypnosis to the treatment programme did not affect outcome.

Moene 2003 provided no results specific to NES. As with their 2002 study, the outcome measures were VRMC, SCL-90 and ICIDH. The authors reported significant treatment results for a hypnosis-based treatment in patients with a conversion disorder, motor type. There was a statistically significant difference between the mean VRMC scores (treatment group 5.9, SD 1.3; control group 3.8, SD 1.4; $t = 5.065$, $P = 0.001$). The analysis of the ICIDH results indicated that the treatment group improved more than controls on this interview measure of general motor impairment (treatment group $t = 3.63$, $P < 0.01$; control group $t = 1.074$, $P = 0.29$). The authors found no significant effect of treatment on the SCL-90 (main effects: group $F(1, 41) = 0.385$, $P = 0.54$; time $F(3, 126) = 3.636$, $P = 0.064$; interaction: $F(1, 41 = 0.345$, $P = 0.56$). At six-month follow up the authors reported that improvement was maintained.

Paradoxical intention and non-epileptic seizures

No specific non-epileptic attack frequency or severity results were provided by Ataoglu 2003 as the primary outcome measure in this study was anxiety score. However, the authors noted percentage of the sample in each group who showed no conversions symptoms in the last two weeks at follow up: Experimental group 14 (93.3%); Control group 9 (60%). There was a significant improvement in recovery rate in the PI group when compared than the diazepam-treated group ($t = 2.27$, $P = 0.034$).

The authors analysed anxiety scores on the HRSA before and after treatment. There was no significant difference between pre-treatment anxiety scores. Both groups recorded significantly decreased anxiety scores by the end of treatment (diazepam-treated group $z = 3.24$, $P = 0.0012$; PI group ($z = 3.41$, $P = 0.0007$). A greater degree of significance was found in the PI group when comparing the difference between pre- and post-treatment anxiety scores ($z = 2.43$, $P = 0.015$).

DISCUSSION

Patients with non-epileptic seizures represent a heterogeneous group with diverse psychological problems against a background of longstanding physical psychological or sexual abuse, inadequate social skills and chronic adjustment problems (Devinsky 1998; Francis 1999a; Reilly 1999; Rusch 2001). Consequently, non-

epileptic seizures represent a serious problem for the patient, the family and the treating clinician. The costs to society can be significant with reported costs in the US of US$100,000 per year per patient (Martin 2003). The challenge for the treating clinician relates to providing an accurate diagnosis and an effective treatment. The evidence for how best to manage and treat patients with this condition however is scarce. The available evidence relies on clinical case studies or studies that lack scientific rigour. A number of authors have recognised the benefits of CBT, including Betts 1993; Lesser 2003; and Ramani 1993. There is a clear recognition that patients with non-epileptic seizures would benefit from cognitive behavioural treatment and this should be in the context of a multidisciplinary team (Betts 1993; Lesser 2003; Ramani 1993).

This review, like previous reviews (Rusch 2001) clearly highlights that there is a lack of well-designed trials to inform treating physicians as to what therapeutic treatments exist and how effective they may be with this condition. According to Reuber and colleagues (Reuber 2005) lessons however can be drawn from the treatment of similar types of psychopathology (somatoform disorder, post-traumatic stress disorder and hypochondria), where cognitive behavioural treatment is considered the psychological treatment of choice. Finally it is difficult to disagree with the view of Devinsky who comments that while "our ability to diagnose NES has advanced significantly in the past two decades, our understanding of its pathophysiology and our ability to provide effective treatment has progressed in small tentative steps in the past century" (Devinsky 1998). It would seem that the status quo remains.

AUTHORS' CONCLUSIONS

Implications for practice

There is currently no sound evidence base on which to base treatment decisions for people with non-epileptic attacks.

Implications for research

Consensus is required regarding appropriate outcome measures, including measures of NES frequency and quality of life measures.

Pragmatic randomised clinical trials are required to assess the effictiveness of potential interventions

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* *Indicates the major publication for the study*

CHARACTERISTICS OF STUDIES

Characteristics of included studies *[ordered by study ID]*

Ataoglu 2003

Methods	Method of randomisation: computerised. Blinding: psychiatrist blinded to treatment group. Treatment duration: 6 weeks.
Participants	Diagnosis: Pseudoseizures/Conversion Disorder using DSM IV criteria N = 30. Participants: 29 female, mean age 27 (range 18-35). History: no information provided regarding previous seizures or comorbid conditions. Setting: Department of Psychiatry, Turkey.
Interventions	Paradoxical Intention group (N = 15): inpatient treatment in psychiatric ward, 2 sessions a day for 3 weeks Diazepam group (N = 15): Outpatient treatment (5-15mg/day). Appointments at 10, 20, 30 & 45 days
Outcomes	Hamilton Rating Scale for Anxiety before and after treatment. Frequency of conversion attacks in past week noted for each patient with changes in these scores converted to percentages. Leaving the study early.
Notes	

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Moene 2002

Methods	Method of randomisation: block. Blinding: therapists and assessors blind. Treatment duration: 8 months.
Participants	Diagnosis: Conversion Disorder (motor type) or Somatisation Disorder (with motor conversion symptoms) using DSM IIIR criteria N = 45. Participants: 34 female, mean age 36.8 years (sd 11.31, range 18-56 years). History: mean age of onset = 32.6 years (sd 10.9 years, range 16-54 years). Mean symptom duration = 3.9 years (sd 4.5 months, range 2 months-22 years). Acute onset, 18. Previous outpatient treatment, 33. Previous inpatient treatment, 18. 32 used medication. 37 used technical aids. Setting: outpatient psychiatric departments in The Netherlands

Moene 2002 (*Continued*)

Interventions	Both groups consisted of inpatient treatment programme (group work, individual physiotherapy, exercise and bed rest). Treatment group (N = 26) included an introductory session followed by 1 hour per week for 8 weeks of hypnosis. Also encouraged to practice self hypnosis for ½ hour per day with audiotape. Control group (N = 23) included 8 weeks of 1 hour sessions encouraging patients to talk about their experience and homework to write about sessions
Outcomes	Video Rating Scale for Motor Conversion Symptoms. D(isabilities) code items from the International Classification of Impairments, Disabilities and Handicaps. Symptom CheckList-90. Stanford Hypnotic Clinical Scale for Adults. Patient expectations of treatment outcome. Leaving the study early.
Notes	

Risk of bias

Item	**Authors' judgement**	**Description**
Allocation concealment?	Unclear	B - Unclear

Moene 2003

Methods	Method of randomisation: block. Blinding: assessors blind. Treatment duration: 3 months (follow up at 6 months for treatment group)
Participants	Diagnosis: Conversion Disorder (motor type) or Somatisation Disorder (with motor conversion symptoms) using DSM IIIR criteria N = 44. Participants: 75% female, mean age 36.6 years (sd 11 years, range 18-61 years). History: Mean age of onset, 33.8 years (sd 11.3 years, range 15-59 years). Mean symptom duration, 3.7 years (sd 4.7 months, range 2 months -16.7 years). Previous history of same or other conversion symptoms, 18. Sudden onset, 16. Identifiable stressor reported, 12. Previous psychiatric care, 32 (9 as inpatient). 21 used medication. 16 used technical aids. Setting: Outpatient psychiatric departments in The Netherlands
Interventions	Treatment group (N = 24) 1 hour introductory session explaining rationale for using hypnosis followed by hypnosis sessions 1 hour per week for 10 weeks. Also encouraged to practice self hypnosis for ½ hour per day with audiotape. Control group (N = 25) waiting list for hypnosis.
Outcomes	Video Rating Scale for Motor Conversion Symptoms. D(isabilities) code items from the International Classification of Impairments, Disabilities and Handicaps. Symptom CheckList-90. Stanford Hypnotic Clinical Scale for Adults. Patient expectations of treatment outcome.

Moene 2003 (*Continued*)

	Leaving the study early.
Notes	

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Aboukasm 1998	Not RCT: retrospective, non-randomised.
Betts 1992a	Not RCT: retrospective, non-randomised.
Betts 1992b	Not RCT: retrospective, non-randomised.
Bhattacharyya 1971	Not RCT: no control group.
Bleichhardt 2004	RCT for CBT of multiple somatoform symptoms but no indication of the symptoms of the sample; therefore no indication that people with non-epileptic attacks were included in the sample
Buchanan 1993	Not RCT: retrospective, non-randomised.
Chemali 2004	Not RCT: case report.
Couprie 1995	Not RCT: case report
Dickes 1974	Not RCT: allocation, no control group.
Dickinson 2003	RCT for care recommendation letter intervention for somatization in primary care but no indication of the symptoms of the sample; therefore no indication that people with non-epileptic attacks were included in the sample
Farias 2003	Not RCT: no control group for people with non-epileptic attacks
Ford 1977	No indication that people with non-epileptic attacks were included in the sample
Goldstein 2004	Not RCT: open trial of the effectiveness of CBT on treatment of non-epileptic attacks
Hellman 1990	RCT for behavioural medicine interventions for people with psychosomatic complaints. No indication that people with non-epileptic attacks were included in the sample

(*Continued*)

Hiller 2003	Neurological symptoms indicated but non-epileptic attacks not specified
Jongsma 1999	Not RCT: follow-up study
Kolk 2004	RCT: no indication that people with non-epileptic attacks were included in the sample
Krull 1990	Not RCT: no control group.
Larisch 2004	RCT: no indication that people with non-epileptic attacks were included in the sample
Lehmann 1984	RCT: no indication that people with non-epileptic attacks were included in the sample
Lempert 1990	Not RCT: retrospective data collection.
Lidbeck 1997	RCT: no indication that people with non-epileptic attacks were included in the sample
Lyles 2003	RCT: no indication that people with non-epileptic attacks were included in the sample
McDade 1992	Not RCT: no control group.
Menza 2001	Not RCT: not randomised, no control group, no indication that people with non-epileptic attacks were included in the study
Muller 2001	RCT: no indication that people with non-epileptic attacks were included in the study
Noyes 1998	Not RCT: not randomised and no control group. No indication that people with non-epileptic attacks were included in the study
Peters 2002	RCT: No indication that people with non-epileptic attacks were included in the study
Prigatano 2002	Not RCT: no control group.
Pu 1986	Not RCT: no control group.
Ramani 1982	Not RCT: no control group.
Riaz 1998	Not RCT: retrospective study.
Rost 1994	RCT: no indication that people with non-epileptic attacks were included in the study
Rusch 2001	Not RCT: no control group and no randomisation.
Shapiro 1997	Not RCT: no control group.
Shapiro 2004	Not RCT: no indication that people with non-epileptic attacks were included in the study

(*Continued*)

Sheehan 1980	RCT: no indication that people with non-epileptic attacks were included in the study
Skupin 1975	Not RCT: no indication that people with non-epileptic attacks were included in the study
Smith 1986	RCT: no indication that people with non-epileptic attacks were included in the study
Speckens 1995	RCT: no indication that people with non-epileptic attacks were included in the study
Speed 1996	Not RCT: no control group and no indication that people with non-epileptic attacks were included in the study
Sumathipala 2000	RCT: no indication that people with non-epileptic attacks were included in the study
Swingle 1998	Not RCT: no control group and no randomisation.
Volz 2000	RCT: no indication that people with non-epileptic attacks were included in the sample
Volz 2003	RCT: no indication that people with non-epileptic attacks were included in the sample
Wilkinson 1994	Not RCT: no control group, no randomisation and no indication that people with non-epileptic attacks were included in the sample
Williams 1979	Not RCT: no control group and no randomisation.
Zaroff 2004	Not RCT: no control group.

DATA AND ANALYSES

This review has no analyses.

APPENDICES

Appendix 1. Search strategies

The following search strategy was used for MEDLINE and modified to suit the other databases.
MEDLINE (Ovid)
1. exp SEIZURES/ or seizure$.mp. [mp=title, original title, abstract, name of substance word, subject heading word]
2. epilep$.ab,ti.
3. non-epileptic attack$.mp.]
4. non-epileptic seizure$.mp.
5. (psychogenic and attack$).mp.
6. (psychogenic and seizure$).mp.
7. pseudoseizure$.mp.
8. functional seizure$.mp.
9. NEAD.mp.
10. non-epileptic attack disorder.mp.
11. hysterical seizure$.mp.
12. somatoform disorder$.mp. or exp somatoform disorders/
13. psychophysiologic$ disorder$/ or exp psychophysiologic disorders/
14. exp dissociative disorders/ or dissociative disorder$.mp.
15. exp conversion disorder/ or conversion disorder$.mp.
16. (somatisation or somatization).mp.
17. or/1-16
18. psychotherapy.mp. or exp PSYCHOTHERAPY, MULTIPLE/ or exp PSYCHOTHERAPY/ or exp PSYCHOTHERAPY, GROUP/ or exp "IMAGERY (PSYCHOTHERAPY)"/ or exp PSYCHOTHERAPY, BRIEF/ or exp PSYCHOTHERAPY, RATIONAL-EMOTIVE/
19. assertive therapy.mp.
20. aromatherapy.mp. or exp AROMATHERAPY/
21. art therapy.mp. or exp Art Therapy/
22. autogenic training.mp. or exp Autogenic Training/
23. abreaction.mp. or exp ABREACTION/
24. aversive therapy.mp. or exp Aversive Therapy/
25. acceptance commitment therapy.mp.
26. exp Behavior Therapy/ or behav$ therapy.mp.
27. behav$ modification.mp.
28. biofeedback.mp. or exp "Biofeedback (Psychology)"/
29. bibliotherapy.mp. or exp BIBLIOTHERAPY/
30. cognitive therapy.mp. or exp Cognitive Therapy/
31. cognitive behav$ therapy.mp.
32. cognitive analytical therapy.mp.
33. counsel$ing.mp. or exp COUNSELING/
34. catharsis.mp. or exp CATHARSIS/
35. colo$r therapy.mp. or exp Color Therapy/
36. crisis intervention.mp. or exp Crisis Intervention/
37. couples therapy.mp. or exp Couples Therapy/

38. conditioning.mp. or exp "Conditioning (Psychology)"/
39. classical conditioning.mp. or exp Conditioning, Classical/
40. operant conditioning.mp. or exp Conditioning, Operant/
41. exp DESENSITIZATION, PSYCHOLOGIC/ or desensitization.mp.
42. dance therapy.mp. or exp Dance Therapy/
43. family therapy.mp. or exp Family Therapy/
44. free association.mp. or exp Free Association/
45. hypnosis.mp. or exp HYPNOSIS/
46. gestalt therapy.mp. or exp Gestalt Therapy/
47. humanistic therapy.mp.
48. flooding.mp. or exp Implosive Therapy/
49. implosive therapy.tw.
50. autosuggestion therapy.mp.
51. music therapy.mp. or exp Music Therapy/
52. marital therapy.mp. or exp Marital Therapy/
53. nondirective therapy.mp. or exp Nondirective Therapy/
54. directive therapy.mp.
55. milieu therapy.mp. or exp Milieu Therapy/
56. meditation.mp. or exp MEDITATION/
57. play therapy.mp. or exp Play Therapy/
58. psychotherapeutic processes.mp. or exp Psychotherapeutic Processes/
59. psychodrama.mp. or exp PSYCHODRAMA/
60. exercise therapy.mp. or exp Exercise Therapy/
61. exp psychotherapy, rational-emotive/ or rational emotive therapy.mp.
62. residential treatment.mp. or exp Residential Treatment/
63. reality therapy.mp. or exp Reality Therapy/
64. exp Suggestion/ or suggestion therapy.mp.
65. socioenvironmental therapy.mp. or exp Socioenvironmental Therapy/
66. systemic therapy.mp.
67. exp Systems Theory/ or systems therapy.mp.
68. stress management.mp. or exp Adaptation, Psychological/
69. psychoanalytic therapy.mp. or exp Psychoanalytic Therapy/
70. transactional analysis.mp. or exp Transactional Analysis/
71. therapeutic community therapy.mp.
72. patient centred therapy.mp.
73. client centred therapy.mp.
74. exp "EARLY INTERVENTION (EDUCATION)"/ or exp CRISIS INTERVENTION/ or exp INTERVENTION STUDIES/
75. therapy.mp.
76. treatment outcome.mp. or exp Treatment Outcome/
77. outcome.mp.
78. or/18-77
79. randomized controlled trial.pt.
80. controlled clinical trial.pt.
81. exp Randomized Controlled Trials/
82. exp Random Allocation/
83. exp Double-Blind Method/
84. exp Single-Blind Method/
85. clinical trial.pt.
86. exp Clinical Trials/
87. (clin$ adj trial$).ab,ti.
88. ((singl$ or doubl$ or trebl$ or tripl$) adj (blind$ or mask$)).ab,ti.
89. exp PLACEBOS/
90. placebo$.ab,ti.

91. random$.ab,ti.
92. exp Research Design/
93. or/79-92
94. (animals not humans).sh.
95. 93 not 94
96. 17 and 78 and 95

WHAT'S NEW

Last assessed as up-to-date: 14 November 2006.

Date	Event	Description
11 August 2009	Amended	Contact details updated.

HISTORY

Protocol first published: Issue 1, 2007

Review first published: Issue 1, 2007

Date	Event	Description
3 September 2008	Amended	Converted to new review format.

CONTRIBUTIONS OF AUTHORS

Baker, G.A (guarantor of the review) was involved in the following:

conceiving the review, designing the review, coordinating the review, data collection for the review, screening search results, screening retrieved papers against inclusion criteria, appraising quality of papers, interpretation of data, performing previous work that was the foundation of current study, providing general advice on the review, writing the review, providing a methodological perspective, providing a clinical perspective, providing a policy perspective, providing a consumer perspective.

Brooks, J was involved in the following: designing the review, coordinating the review, data collection for the review, screening search results, organizing retrieval of papers, screening retrieved papers against inclusion criteria, appraising quality of papers, abstracting data from papers, writing to authors of papers for additional information, providing additional data about papers, obtaining and screening data on unpublished studies, data management for the review, interpretation of data, providing a methodological perspective, providing a clinical perspective, providing a policy perspective, providing a consumer perspective, writing the review.

Goodfellow, L. was involved in: data collection for the review, screening search results, organising retrieval of papers, screening retrieved papers against inclusion criteria, appraising quality of papers, abstracting data from papers, data management for the review.

Bodde, N. was involved in: conceiving the review, designing the review, appraising quality of papers, abstracting data from papers, providing a methodological perspective, providing a clinical perspective, providing general advice on the review.

Aldenkamp, A.P. was involved in: conceiving the review, designing the review, appraising quality of papers, abstracting data from papers, providing a methodological perspective, providing a clinical perspective, providing general advice on the review, performing previous work that was the foundation of current study.

DECLARATIONS OF INTEREST

None known

INDEX TERMS

Medical Subject Headings (MeSH)

Hypnosis [methods]; Psychotherapy [methods]; Quality of Life; Randomized Controlled Trials as Topic; Seizures [*therapy]

MeSH check words

Humans