Treatment of Functional (Psychogenic) Movement Disorders

Luciana Ricciardi · Mark J. Edwards

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Abstract Functional (psychogenic) movement disorders are a common source of disability and distress. Despite this, little systematic evidence is available to guide treatment decisions. This situation is likely to have been influenced by the “no man’s land” that such patients occupy between neurologists and psychiatrists, often with neither side feeling a clear responsibility or ability to direct management. The aim of this narrative review is to provide an overview of the current state of the evidence regarding management of functional movement disorders. This reveals that there is some evidence to support the use of specific forms of cognitive behavioral therapy and physiotherapy. Such treatments may be facilitated in selected patients with the use of antidepressant medication, and may be more effective for those with severe symptoms when given as part of inpatient multidisciplinary rehabilitation. Other treatments, for example hypnosis and transcranial magnetic stimulation, are of interest, but further evidence is required regarding mechanism of effect and long-term benefit. Though prognosis is poor in general, improvement in symptoms is possible in patients with functional movement disorders, and there is a clear challenge to clinicians and therapists involved in their care to conduct and advocate for high-quality clinical trials.

Keywords Functional movement disorders · Psychogenic · Physiotherapy · Cognitive behavioral therapy

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L. Ricciardi · M. J. Edwards (✉)
Sobell Department of Motor Neuroscience and Movement Disorders,
Institute of Neurology, University College London, Queen Square,
London WC1N 3BG, UK
e-mail: m.j.edwards@ucl.ac.uk

L. Ricciardi
Department of Clinical and Experimental Medicine,
University of Messina, Messina, Italy

Introduction

The term functional (psychogenic) movement disorders (FMD) has historically been applied to disorders that manifest with physical symptoms—specifically abnormal movements (gait disorders, tremor, dystonia, etc.)—but which cannot be attributed to any of known underlying organic disorder and which instead is presumed to be due to “psychological factors”. However, we prefer to define this disorder by its clinical appearance, rather than by any causative speculation, as a movement disorder that is significantly altered by distraction or non-physiological manoeuvres (including dramatic placebo response) and that is clinically incongruent with movement disorders known to be caused by neurologic diseases [1].

As FMD are not due to apparent irreversible damage of neurologic structures, patients appear to have the potential for a complete recovery. However, patients with FMD are generally reported to have poor outcome, with persistent symptoms reported in 65–95 % patients [2–4]. Such reports, most of which are based in tertiary referral centers may overstate poor outcome, but a recent systematic review of outcome in patients with functional motor symptoms, in general, also found outcome, in general, to be poor, with most studies finding at least 50 % of patients to still be symptomatic at long-term follow-up [5].

Therefore, clinical management of FMD represents a challenge with many facets, including lack of a commonly-accepted definition and classification of the disorder, lack of consensus about mechanism, different philosophical approaches to the divisibility or not of “psychological” and “physiological” phenomena, professional and societal concern about the rates of deliberate feigning of symptoms in this patient group, and the lack of official guidelines for the treatment.

FMD were previously classified within *Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV* as conversion disorders of motor subtype. Conversion disorder within *DSM-IV* required the presence of a psychological stressor and

the exclusion of malingering as diagnostic criteria. Evidence suggests that psychological stressors are not commonly reported by patients with FMD at onset [6, 7], and exclusion of malingering is acknowledged to be virtually impossible in the normal clinical setting. *DSM V* criteria have introduced the term “functional neurological symptom disorder”, and have removed the need for the presence of a psychological stressor and exclusion of malingering. In addition, criteria have focused on positive diagnostic features on history and physical examination [8].

This discussion underlines the difficulty posed by terminology in this area. There are a number of terms in circulation, each of which has some advantages and disadvantages. As outlined in detail here [9], we believe that there are good reasons for choosing the term “functional” above other terms. However, we acknowledge that there are arguments to the contrary, particularly for the use of the term “psychogenic”. It is beyond the scope of this article to attempt to settle these arguments, and we wish to make the reader aware of the differences of opinion that currently exist regarding terminology.

Functional neurological symptoms commonly co-occur (e.g., FMD plus non-epileptic attacks), and it seems most likely that all such disorders share common pathophysiological mechanisms. Recent proposals regarding underlying mechanisms for functional neurologic symptoms have concentrated on the role of abnormal self-directed attention, and abnormal beliefs and expectations about symptoms, which together are proposed to bring about a lack of sense of agency for motor and sensory phenomena [10, 11]. An important role has been proposed for physical precipitating factors (e.g., injury, illness [12]). Such events have both physical and psychological consequences, and the combination of these with pre-existing personality and psychological traits provides a possible route to triggering of symptoms. There are likely to be many different routes to the development and maintenance of functional neurological symptoms, and this argues for an individualized approach to diagnostic explanation and treatment.

Aim

The aim of the present narrative review is to discuss the treatment interventions, which have been described in the literature for FMD.

Methods

A PubMed literature search was conducted, focusing on treatment studies on FMD from 1960 until July 2013. The search included articles with the terms: “conversion disorder”, “functional”, “psychogenic”, “medically unexplained”, and “hysteria” in the title or abstract. These terms were combined with

the terms physical therapy, rehabilitation, psychotherapy and behavioural therapy, and keywords “physiotherapy”, “physical therapy”, “exercise”, “therapeutics”, and “drug”. Titles and abstracts were reviewed to identify potentially relevant articles with relevance to FMD, which were then retrieved to review the full article. All results were limited to English-language articles.

Diagnostic Explanation

Although direct trial evidence is lacking in patients with FMD, providing patients with a suitable diagnostic explanation seems likely to be of great importance in securing a successful start to treatment. Certainly, there is evidence from patients with functional symptoms in general that diagnostic explanations based on “stress” or psychological trauma are not generally helpful, and are usually interpreted as meaning that there is nothing wrong with them [13]. Stone et al. [14] evaluated this issue with unselected neurology outpatients and found that many terms in common usage to describe functional neurological symptoms (e.g., medically unexplained, psychosomatic) were judged by patients as suggesting that the doctor thought their symptoms were “put on” or “all in the mind”. The term “functional” has been proposed as a useful term, which does not presuppose a cause for symptoms that are not proven [9].

There is some evidence from patients with non-epileptic seizures that explaining symptoms as genuine neurological symptoms that are not due to structural or degenerative disease, and which have the capacity to recover and in that context stopping anti-epileptic medication, is very acceptable to patients and leads, in its own right, to a large reduction in non-epileptic attacks, hospital attendances, and healthcare costs [15, 16].

A suitable diagnostic explanation is obviously a desirable step in the management of any medical condition, but it may be of particular importance for those with functional neurologic symptoms, including FMD. Uncertainty and worry about symptoms driven by persistently normal tests despite on-going symptoms and a lack of explanation is likely to increase attention towards symptoms and foster particular illness beliefs (e.g., that symptoms are likely to be permanent or are due to a serious underlying illness). Such factors are likely to directly feed into aspect of mechanism of functional neurological symptoms.

It has been suggested that directly demonstrating patients’ diagnostic physical signs to them can be useful in helping persuade patients and their families of the diagnosis [17]. Thus, demonstrating a patient’s positive Hoover’s sign, or demonstrating distractibility of a functional tremor, can show patients clearly how the diagnosis is being made, and takes the focus away from negative test results (and the obvious question: “Do I need more tests?”). There are growing sources of support and information for patients, for example the site www.neurosymbols.org.

In clinical practice, in particular patients, it may also be useful to demonstrate the normality of neuroimaging studies such as DaT-scan in patients with psychogenic parkinsonism.

All the above considerations underline the importance of the acceptance of the diagnosis by the patient, which appears to be an important factor in prognosis [18].

Physiotherapy

Physiotherapy has face validity as a treatment for patients with motor symptoms, and is also likely to be a treatment modality that is acceptable to patients. There is also evidence that it is commonly recommended as treatment by neurologists [19]. Despite this, very few studies have addressed the role of physiotherapy in treatment of FMD. In a recent systematic review of physiotherapy for patients with functional motor symptoms [20], 28 studies were identified with a total of only 373 patients. The vast majority of these studies were single case reports or small case series. Most studies reported a positive outcome from physiotherapy.

In the largest study of physiotherapy for FMD to date [21], reported on an outpatient physiotherapy program, comprising a 1-week intensive rehabilitation course based on the concept of motor reprogramming. The program specifically focused on the abnormal movement with the idea that it represents an abnormal learned pattern of movement that could be “unlearned” via physiotherapy. There was limited explicit discussion of psychological factors, though all patients were seen once by a psychologist. The authors compared the outcomes of the last 60 consecutive patients completing the program with a historical control group of 60 patients with a diagnosis of FMD who did not undergo rehabilitation for various reasons (including non-acceptance of the diagnosis and lack of insurance cover for the treatment). At the end of the program, 69 % of patients reported that they were “better” or “much better, in remission”. At follow-up, on average 2 years after treatment, 60 % of the intervention group reported that they were “better” or “much better, in remission”, compared with 22 % of the control group.

There may even be a role for more general group exercise in the treatment of FMD. Dallochio et al. [22], for example, observed a relevant improvement in clinical outcomes in 10 of 16 patients (62 %)—outpatients with FMD who completed a thrice-weekly, 12-week mild walking program—thus suggesting regular low-to-medium intensity exercise as an efficacious, safe and pleasing intervention.

Psychological Therapy: Cognitive Behavioral Therapy and Psychotherapy

Cognitive behavioral therapy (CBT) is a psychological therapy that addresses cognitive distortions and promotes behavioral changes. Its use in FMD specifically has not been widely

studied, but a number of studies have addressed the use of CBT in treatment of patients with functional neurological symptoms in general. The role of CBT as treatment for somatoform disorders is fairly well established [23]. For example, Speckens et al. [24] conducted a randomized controlled trial in patients with unexplained physical symptoms (the authors did not specify which kind of symptoms) comparing a group of patients undergoing CBT with a control group with optimized medical care. The main therapeutic techniques included the identification and adjustment of pathologic automatic thoughts and proposing behavioral experiments to the patient, with the intent of disrupting the vicious cycle of the symptoms and their consequences.

Outcome measures included several subjective psychological, social and symptom-related questionnaires (i.e., clinical impression of degree of change, Likert-scale for frequency and intensity of symptoms, psychological distress and functional impairment scales, hospital anxiety and depression scale, sickness impact profile, functional impairment analogue scale, illness attitude scale, number of general practitioner visits). At the 6-month follow-up, the authors showed that there was a higher recovery rate, lower intensity of symptoms, and less impairment of sleep in the intervention group than in the control group, and suggested that CBT approach, such as the recognition of the patient’s attributions of their symptoms and effective reassurance, might be a potential treatment.

LaFrance et al. [25] conducted an open-label study on 17 patients with non-epileptic seizures (NES) utilizing a CBT manual-based therapy, addressing mood–cognition–environment connections, automatic thoughts, catastrophic thinking, and somatic misinterpretation. They reported a 50 % reduction of attack frequency in 11/17 patients; moreover, patients’ scores on psychiatric and psychosocial scales improved at the end of the study. A recent pilot randomized clinical trial (RCT) comparing NES patients who underwent CBT *versus* patients under standard medical care, showed that the CBT arm had lower seizure frequency at the end of treatment, confirming the potential role of CBT in the treatment of these patients [26].

Sharpe et al. [27] conducted a RCT of patients with functional neurologic symptoms, including some patients with motor symptoms using a CBT-based self-help workbook and a very limited number of face-to-face sessions to explain its use and to give support. This support was given by a nurse rather than a trained psychologist.

The workbook was developed using existing CBT manuals for depression and anxiety. It explained the methods whereby functional symptoms were diagnosed, emphasized a physiological explanation of symptoms based on involuntary activation of fight or flight responses, and described self-management techniques (e.g., coping with symptoms, reducing unhelpful thinking).

The primary outcome of the study was a self-rated clinical global improvement scale, while secondary outcomes were

changes in symptom-burden, anxiety, depression, and physical function scales. At 3 months, 30 % of patients in the intervention group rated themselves as better or much better compared with 13 % of controls (by means of clinical global improvement); at 6 months the additional effect of this intervention on improvement in subjective health was smaller and no longer statistically significant (38 % of patients in the intervention group rated themselves as better or much better compared with 27 % of controls).

Specifically for patients with FMD, there is only very limited evidence for the role of CBT, although the evidence for other functional symptoms presented above suggests that it is likely to be of benefit. LaFrance and Friedman [28] reported a single case of a patient with functional generalized dystonia and facial twitching who had complete resolution of symptoms after 12 weeks of CBT. Although it has a promising role in the clinical management of these disorders, we acknowledge that the CBT approach has some limitations, including a paucity of well-trained therapists qualified and skilled in this technique, and the lack of availability in some countries.

Hinson et al. [29] recruited 10 patients with FMD for a single-blinded clinical trial to receive 12 weeks of treatment with outpatient psychodynamic psychotherapy, and use of antidepressants or anxiolytic drugs when necessary (according to the following psychiatric comorbidities: major depressive disorder, post-traumatic stress disorder, personality disorder, anxiety, bipolar disorder). This psychotherapy approach falls in the category of brief psychotherapy and is based on psychoanalytic theories. Nine of 10 recruited patients completed the study and showed an improvement in motor symptoms as assessed by means of psychogenic movement disorders video rating scale, and in psychological outcome measures scores.

More recently, Kompoliti et al. [30] conducted a 6-month randomized controlled trial in a group of 15 patients with FMD who were assigned either to an immediate short-term psychodynamic psychotherapy for 3 months followed by an observation period of 3 months without therapy, or to delayed psychodynamic psychotherapy, with a 3-month observation period, followed by 3 months of psychodynamic psychotherapy. They reported that there was no specific benefit from psychotherapy either early or late as opposed to observation and support. There was a trend toward greater improvement in a measure of anxiety with psychotherapy [30].

Pharmacological Treatment

Voon and Lang [31] conducted an open-label study comparing the efficacy of 2 antidepressants (either citalopram or paroxetine) in 15 patients with FMD according to the Fahn and Williams diagnostic criteria [32]. Three patients also received concurrent supportive psychotherapy. Eight of 10 patients had substantial improvements in both motor and global outcomes, and 7 of these had a complete remission of motor symptoms.

The authors concluded that antidepressants may be beneficial for these disorders; however, it remains unclear whether the benefit on the motor symptoms is a general effect mediated through reduced depression and anxiety, or a specific effect on somatic symptoms.

One randomized controlled trial [33] has evaluated the efficacy of D2-blocking neuroleptics (haloperidol vs sulpiride) in a total of 18 patients with conversion disorder of the motor type (some of these patients had previously failed to treatment with tricyclic antidepressants and benzodiazepines). Patients were evaluated with clinical and psychological scales, and serum prolactin level was measured. The authors showed that in the haloperidol group 1 patient substantially improved, 3 partly improved, and 2 did not improve. In the sulpiride group, 8 patients remarkably improved, 2 partly improved, and 2 did not improve. However, in clinical practice, the use of neuroleptics is limited by the potential and sometimes severe adverse effects of these drugs, including tardive movement disorders.

Other Techniques

Placebo

Expectations and prior beliefs alter sensory experience, and this is the basis for placebo effects. Suggestion is the voluntary use by the doctor of techniques that give a patient a belief or expectation that he or she will be cured; these techniques include persuasion, hypnosis, and placebo. The ethics and utility of suggestion, in general, and of placebo, in particular, are much debated in clinical management of FMD and NES. It has been argued that suggestion might be unethical, and it may alter the doctor–patient relationship and diminish patient autonomy [34]. Others have suggested that use of placebo is ethically justified in the treatment of FMD [35].

Placebos fall into 2 main categories with regard to patients with FMD. One is the use of techniques that have no conceivable physiological mechanism to produce a change in symptoms. These include application of a tuning fork to the limb, with the suggestion that it will stop the limb from trembling, or the injection of an inert substance (e.g., saline), with the suggestion that it is a drug that will release a fixed abnormal posture. One case report by Van Nuenen et al. [36] describes a patient with functional generalised involuntary jerks who completely recovered after acupuncture.

The other category is the use of medications or other treatments that are recognized treatments for movement disorders, but which have their effect in these patients via a placebo effect and not via a typical effect of the drug or procedure. Examples of these responses include immediate response of patients with fixed dystonia to botulinum toxin injections (which take about 3 days to start working physiologically [37]), and a dramatic response of patients with

functional parkinsonism to levodopa, or even to deep brain stimulation surgery. The clinician needs to be aware of the possibility of such placebo responses and not be misled into, for example, thinking the patient must have Parkinson's disease by the dramatic response of symptoms to levodopa. Often, over time, the placebo response becomes less stable and symptoms will relapse.

Hypnosis

Similar alterations of brain function have been suggested to occur in FMD and hypnotic states [38–40]. Moene et al. [41] conducted a RCT in a group of 45 patients with conversion disorder (motor type) or somatization disorder (with motor conversion symptoms) evaluating the efficacy of adding hypnosis to a standard inpatient treatment. Patients in both treatment (standard inpatient program+hypnosis) and control (only inpatient program) groups followed a group therapy program with the aim of increasing problem-solving skills (including group psychotherapy, social skills training, formulation and evaluation of treatment goals, creative therapy, and sports, physiotherapy, and individual exercise sessions). The hypnosis treatment encompassed of 8 weekly 1-h sessions and self-hypnosis with audiotape. The primary outcome measure used was the Video Rating Scale for Motor Conversion Symptoms; secondary outcomes were disability scales. In this relatively small trial, the authors reported no significant added effect of hypnosis and concluded that the addition of hypnosis to the treatment program did not affect outcome.

The same research group [42] conducted another RCT in 48 patients with conversion disorder of the motor type evaluating hypnosis *versus* no intervention. The hypnosis group underwent 10 weekly 1-h sessions, and 2 hypnotic strategies were utilized, according to a manual: direct symptoms alleviation and emotional expression/insight. The same outcomes measures as the previous study were utilized. At the end of the study, considering the Video Rating Scale for Motor Conversion Symptoms score, 90 % of treated patients improved *versus* 26.1 % of control group patients. Taken together, these 2 studies suggest that hypnosis-based treatment might be efficacious for patients with conversion symptoms of motor type, but is not more efficacious than inpatient multidisciplinary treatment.

Transcutaneous Electrical Nerve Stimulation

Transcutaneous electrical nerve stimulation (TENS) devices emit low-voltage electrical currents to the skin, and are widely used to treat acute and chronic pain. Wojtecki et al. [43] reported a transient improvement with nerve stimulation in a patient with functional propriospinal myoclonus. Ferrara et al. [44] studied 19 patients with FMD who underwent daily TENS to produce a tingling sensation without muscle twitch

or pain. The authors reported an improvement in motor symptoms, as assessed by the psychogenic movement disorders rating scale score after an average of 6.9 months of treatment. Five of 19 (25 %) patients reported a complete resolution of symptoms. Interestingly, 2 patients reported a worsening of symptoms after the initial TENS trial and did not go further.

Transcranial Magnetic Stimulation

Transcranial magnetic stimulation is a technique where a strong magnetic field can be used to generate an electrical current in the cortex. This electrical current can, if it is of the right intensity, produce activation of pyramidal neurons and produce a muscle twitch. Lower-intensity repetitive stimulation (e.g., 20 mins of pulses given at 1 Hz) can produce changes in excitability of the stimulated area of cortex that outlast the period of stimulation by an hour or so.

A number of studies have evaluated the use of transcranial magnetic stimulation in patients with functional motor symptoms [45, 46]. All studies have used very high intensity stimulation, usually comprising a small number of pulses. Such stimulation causes muscle twitching and is unlikely to result in a long-term “plastic” effect. Most studies have reported dramatic improvement in symptoms, with some data on continued benefit at long-term follow-up. However, the proposed mechanism of effect claimed by such studies, neuromodulation, seems highly unlikely, and it seems more likely that there is a complex placebo effect caused by the external triggering of movement. Regardless of the mechanism of effect, however, the claimed long-term benefits deserve further controlled study.

Inpatient Multi-disciplinary Therapy

When outpatient treatment fails and patients remain disabled by symptoms, a multidisciplinary in-patient rehabilitation approach is often suggested. However, data to support such treatment are limited and some practical issues (e.g., lack of insurance coverage in some countries, such as the USA) make inpatient multidisciplinary rehabilitation unfeasible for many patients.

Moene et al. [41] reported on the usefulness of the addition of hypnosis to an inpatient program (see above). Although the hypnosis treatment did not provide additional benefit to the inpatient program, the treatment program itself did lead to improvement in symptoms in the majority of patients. Saiffee et al. [47] conducted a retrospective study investigating the long-term outcomes of a 4-week inpatient multi-disciplinary therapy program for patients with functional motor symptoms. After a mean follow-up period of 7 years, assessments were performed by telephone, by means of questionnaires evaluating patient's perceived impact of symptoms on function prior to admission, at time of discharge, and at the current time.

Fifty-eight percent of patients felt that on discharge from hospital their symptoms had improved to some extent, 35 % reported no change, and the remainder judged themselves to be worse. Fifty-eight percent of patients reported the inpatient program to have been helpful or very helpful at long-term follow-up.

Also, McCormack et al. [48] evaluated, in a retrospective comparative study, the efficacy of an inpatient, multidisciplinary intervention in 33 chronic, severe motor conversion disorders compared with a group of 33 traumatic brain injury patients treated at the same neuropsychiatry unit. Patients with chronic and severe motor conversion disorders significantly improved over the course of admission in terms of independence with activity of daily living, mobility, and motor symptoms score. When analyzing the presence of any predictor factor of outcome, no significant predictors of good outcomes in terms of mobility or disability score were found; however, receiving CBT approached significance as a predictor of good activity of daily living outcomes, and patients with non-epileptic dissociative features were more likely to stay in hospital for longer.

Conclusions

In this narrative review, we evaluated the main treatment approaches available in current clinical practice. It is surprising that for such a common and disabling condition there are not more high-quality treatment studies. This likely reflects the long-standing ambiguity about who should be treating such patients (neurologists or psychiatrists), and, indeed, if such patients need treatment at all (reflecting an on-going ambivalence about feigning as an explanation for symptoms).

There has been a clear shift in interest and understanding among neurologists with regard to patients with functional neurological symptoms in recent years, and it seems likely that this will lead to greater research activity in testing and developing treatments for patients with FMD and other functional neurological symptoms.

Required Author Forms Disclosure forms provided by the authors are available with the online version of this article.

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