



Functional movement disorders: Successful treatment with a physical therapy rehabilitation protocol

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ABSTRACT

Background: Functional (“psychogenic”) gait and other movement disorders have proven very difficult to treat. **Objectives:** Describe the Mayo Clinic functional movement disorder motor-reprogramming protocol conducted in the Department of Physical Medicine and Rehabilitation (PMR), and assess short-term and long-term outcomes.

Design: Historical-cohort-study assessing non-randomized PMR intervention.

Setting: Tertiary care center.

Patients: Interventional group: 60 consecutive patients with a chronic functional movement disorder that underwent the PMR protocol between January 2005 and December 2008. Control group: age- and sex-matched patients with treatment-as-usual ($n = 60$).

Interventions: An outpatient, one-week intensive rehabilitation program based on the concept of motor-reprogramming following a comprehensive diagnostic neurological evaluation, including psychiatric/psychological assessment.

Main outcome measures: Improvement of the movement disorder by the end of the week-long program (patient- and physician-rated), plus the long-term outcome (patient-rated).

Results: Patient demographics: median symptom duration, 17 months (range, 1–276); female predominance (76.7%); mean age 45 years (range, 17–79). Physician-rated outcomes after the one-week treatment program documented 73.5% were markedly improved, nearly normal or in remission, similar to the patient-ratings (68.8%). Long-term treatment outcomes (patient-rated; median follow-up, 25 months) revealed 60.4% were markedly improved or almost completely normal/in remission, compared to 21.9% of controls ($p < 0.001$).

Conclusions: Short-term and long-term successful outcomes were documented in the treatment of patients with functional movement disorders by a rehabilitative, goal-oriented program with intense physical and occupational therapy. The rapid benefit, which was sustained in most patients, suggests substantial efficacy that should be further assessed in a prospective, controlled, clinical trial.

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1. Introduction

Functional movement disorders (FMD) are characterized by abnormal motor behaviors that are inconsistent with an organic etiology. These may resemble organic tremor, dystonia, other hyperkinetic conditions, gait disorders, paresis or combinations. These may account for 3% [1] to 15% [2] of patients seen by

neurology movement disorder specialists but are also common in general neurology clinics.

These conditions are often categorized as “psychogenic”, and this term is sometimes used interchangeably with “functional”. The lay-dictionary defines “psychogenic” as, “originating in the mind or in mental or emotional conflict.” [3]. This obviously implies a primary psychological cause and this may not be strictly applicable to many patients. Moreover, telling patients their life-altering disorder is “psychogenic,” with all the implications, may sabotage the working relationship with the clinician. In this manuscript, we will avoid that term, preferring “functional”.

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Once diagnosed, FMD present an enormous therapeutic challenge. Prognosis is often characterized as poor, with most patients failing to substantially improve, especially among those with symptoms persistent beyond one year [4–6]. Even among series that are more optimistic, substantial numbers of patients have persistent disability [2].

With the notoriety accorded similar disorders by Freud more than a century ago [7], therapeutic strategies have focused especially on psychiatric/psychological interventions. In the current era, psychotherapy, antidepressant and other psychoactive medications are typically an early treatment approach [8–10]. Although many publications have attested to the benefits of psychotherapeutic and other psychological/psychiatric strategies, our experience has not been as gratifying, and the pessimistic outcomes from movement clinics are consistent with that perception [4–6].

Physical therapy has also been advocated for such patients, although specific strategies have been left to individual treating therapists [11]. In our experience many of these patients have already undergone physical therapy, but failed to substantially benefit; thus, generic physical therapy in the absence of a specific treatment-program has not been successful.

In fact, there is no consensus about treatment of FMD [12]. Clinicians generally find this to be a very unsatisfying aspect of their practice, with frustration among both patients and physicians. This was our collective experience for many years; we could diagnose, but not effectively treat.

A number of years ago, we recognized that functional speech/voice disorders were highly responsive to a behavioral motor reprogramming approach by our Mayo Speech-Language Pathology colleagues [13,14]. In fact, a parallel approach was being used successfully, but inconsistently in our Physical Medicine and Rehabilitation (PMR) Department as treatment for FMD. Encouraged by these outcomes, we developed a more structured motor-reprogramming treatment protocol for FMD patients implemented in the PMR Department.

Such motor-reprogramming in the context of physical medicine has been used for treatment of FMD with limited precedents [15,16]. The approach involves specifically focusing on the aberrant movements and postures, breaking these down into the individual motor components and gradually reconstructing more normal motor patterns. With this strategy, appropriate motor patterns are reinforced and inappropriate movements are ignored (extinguished). By gradually rebuilding or re-shaping motor movements, more normal patterns can be achieved. Our initial treatment protocol arbitrarily confined this to one intensive week of twice-daily physical and occupational therapy, after the physiatrist had initially designed the therapy program for that patient. Our initial experience suggested that one week was sufficient. This has been utilized as the primary therapeutic strategy for the treatment of FMD patients diagnosed in our movement disorders clinic since 2005.

We now describe our experience with the first 60 consecutive patients who were diagnosed with an FMD in our Neurology Department and subsequently treated with this approach. This was exclusively designed as a therapeutic PMR protocol for the benefit of our patients, and we had no a-priori plan to formally study/report the outcomes. The initial follow-up called for reassessment only at the end of the treatment week. As substantial efficacy became apparent, we elected to better assess outcomes, which included adding phone- and letter-follow-up to tabulate longer-term responses. For comparison we also included a control-group of patients who were similarly diagnosed, but not treated with this approach.

2. Patients and methods

2.1. Study-design

For this historical-cohort-study, we retrospectively identified from our Mayo computer-database all patients who had been evaluated between 1/1/2005 and 12/31/2008 in the Mayo Clinic Department of Neurology and given a final diagnosis of an FMD. These included varied functional motor disorders: gait, tremor, other hyperkinetic movements, or paresis. From this group we then identified all those subsequently treated during this period in the Mayo PMR Department utilizing this motor-reprogramming protocol. This retrospective study was approved by the Mayo Clinic Institutional-Review-Board.

2.2. Treatment-group

The first 60 consecutive patients who met the following criteria constituted the treatment group: (a) given an clinically-established diagnosis of a functional movement disorder, consistent with criteria of Fahn and Williams [17], and counseled about this; (b) completed whatever diagnostic testing thought appropriate prior to initiating the treatment protocol; (c) completed at least 3 days of the 5-day PMR treatment protocol. Excluded from this analysis were cases where the diagnosis was unclear ($n = 16$), or where there were major departures from the PMR protocol ($n = 21$).

2.3. Control-group (treatment-as-usual)

For comparison of long-term outcomes, we selected 60 age- and sex-matched patients evaluated in the Department of Neurology and given a diagnosis of an FMD who did not undergo the rehabilitation program. Reasons for not undergoing the PMR protocol included: lack of insurance coverage; logistic reasons (e.g., travel, hotel expense, family-time away from work); non-acceptance of the diagnosis; neurology-staff unaware of this treatment program early-on.

2.4. Intervention

The patient's specific PMR program was initially designed by the physiatrist on the first protocol day. We suspected that a crucial component for success was the initial PMR interaction and counseling before the motor therapy ensued. This counseling included expressed confidence that this approach had a good likelihood of succeeding, which was important for two reasons: (a) many patients had already failed physical therapy programs; (b) promoting a positive attitude. The PMR strategy was described in operational terms, such as the presence of a "disconnect" between the patient's normal brain motor program and the normal nerves/muscles used to carry out the movement; thus, the therapy would focus on eliminating that "disconnect." No attempt was made to explain how the "disconnect" initially occurred, but rather the emphasis was on re-establishing the normal motor program.

Following the initial counseling, the PMR treatment plan was implemented with twice-daily physical/occupational therapy for 5 consecutive days. If a functional speech disorder was present, consultation and therapy with a speech-language pathologist was also done during this week ($N = 7$; speech outcomes not included in current analysis).

An evaluation by a psychiatrist or psychologist was part of the protocol, usually done after the diagnostic workup was completed and typically early in the treatment week. This focused on identifying: (a) possible causes or contributory factors, such as an abuse history; (b) other psychological issues, such as depression or anxiety, that might interfere with the program and recovery. While most of the patients met DSM-IV criteria for a conversion or somatoform disorder [18], the psychologist/psychiatrist reinforced the program model that targeted relearning normal motor function, rather than focusing on psychological factors that preceded the motor problem.

The rehabilitation program was aimed at establishing normal movement patterns, while ignoring abnormal movements, taking a step-by-step strategy, modified from schemes previously described in the PMR literature [15,16]. Motor dysfunction was objectified in operational rather than psychological terms. The motor reprogramming strategy began with establishing very elementary movements in the affected limb or body region, and building on those. Often, distracting motor tasks were employed to extinguish abnormal movements (such as tapping the fingers of the unaffected hand in a patient with unilateral tremor, or bouncing a balloon while working on trunk stability/standing balance). As simple movements were satisfactorily performed, appropriate motor complexity was added, gradually approximating motor-normality. Positive gains were verbally reinforced. Abnormal movements were ignored, although major and frequent adventitious intrusions during the PMR sessions suggested the advisability for rest periods. Repetition was thought important to lock-in the gains. The necessity of continued/ongoing practice of these principles beyond completing the PMR week was emphasized.

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