# CLINICAL PROFILE AND PREDICTORS OF OUTCOME IN FUNCTIONAL MOVEMENT DISORDERS

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**Background and aims**: In functional movement disorders (FMDs), subject perceives various movement disorders as involuntary, despite clinical findings demonstrating intact neurological function and volitional component. We aimed to delineate clinical profile and predictors of long-term outcome in FMDs

**Materials and methods**: We retrospectively reviewed the baseline demographic and clinical profile of all patients with FMD diagnosed in our hospital from 1999-2024. Their current status was evaluated through systematic telephonic interviews. The patients were retrospectively categorized based on published diagnostic criteria and the outcome and functional status were noted. The baseline factors influencing outcome were determined

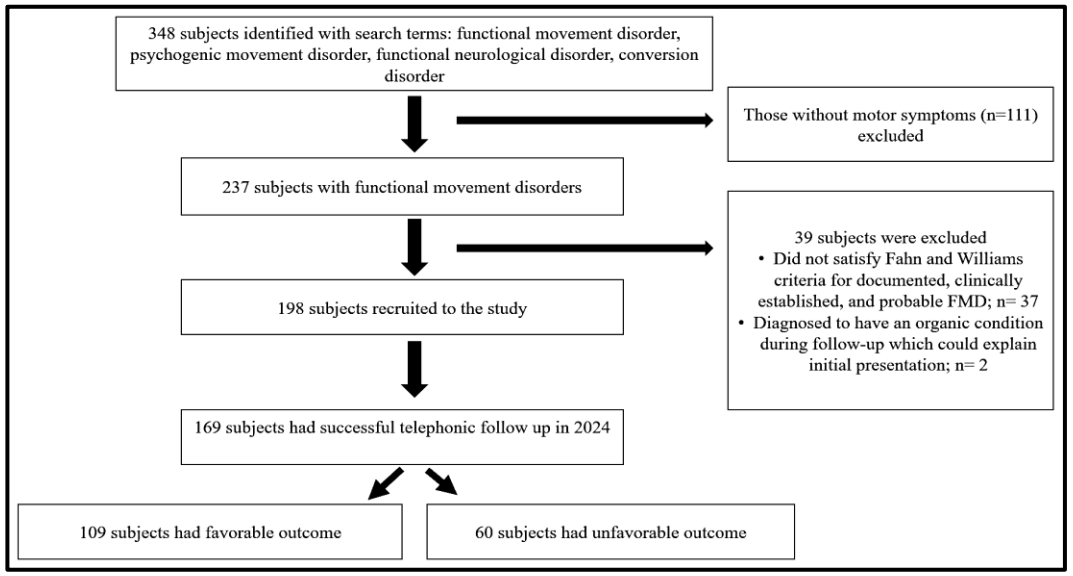


Figure 1: Inclusion of patients in the study

**Results**: Of the 198 subjects with FMDs, mean age was 35.2 ± 15.4 years and 60.6% were women

Most presented with acute onset and had fluctuating course

The most common FMDs phenomenology was gait dysfunction followed by mixed movement disorders

Tremor was the most common individual movement disorder phenomenology

Table 1: Baseline demographic and clinical characteristics

| Characteristics | Whole group, n=198 | Favourable outcome during follow-up, n=109 | Unfavourable outcome, n=60 | p-value |
|---|---|---|---|---|
| **Demographic profile** | | | | |
| Age of onset | 33.4 ± 15.4 | 31.3±13.8 | 39.1±16.9 | **0.001** |
| Age at presentation<br>< 18 years<br>≥ 18 years | 35.17 ± 15.4<br>39 (19.7)<br>159 (80.3) | 32.22±13.9 | 42.43±15.7 | **<0.001** |
| Gender: Male<br>Female | 78 (39.4)<br>120 (60.6) | 43 (39.4)<br>66 (60.6) | 20 (33.3)<br>40 (66.7) | 0.43 |
| Occupational class:<br>Student<br><br>Unemployed<br><br>Employed | <br>46 (23.2)<br>60 (30.3)<br>92 (46.5) | <br>30 (27.5)<br>28 (25.7)<br>51 (46.8) | <br>7 (11.7)<br>24 (40)<br>29 (48.3) | **0.03** |
| History of similar illness in acquaintances | 21 (10.6) | 11 (10.1) | 8 (13.3) | 0.45 |
| **Clinical features:** | | | | |
| Mode of onset:<br>Hyper-acute (within 24hrs)<br>Acute (1 day- 4 weeks)<br>Subacute (4-8 weeks)<br>Chronic (>8 weeks) | <br>61 (30.8)<br>93 (47)<br>28 (14.1)<br>16 (8.1) | <br>46 (42.2)<br>44 (40.4)<br>10 (9.2)<br>9 (8.3) | <br>7 (11.7)<br>34 (56.7)<br>14 (23.3)<br>5 (8.3) | **<0.001** |
| Duration of symptoms, in months | 22.21 ± 48.2 | 12.89±23.4 | 40.90±77.1 | **<0.001** |
| Phenomenology:<br>Hyperkinetic<br>Tremor<br>Dystonia<br>Chorea<br>Myoclonus<br>Unclassified hyperkinetic movements<br><br>Parkinsonism<br>Gait<br>Mixed phenomenology<br>Falls<br>Weakness | <br>112 (56.5)<br>65 (32.8)<br>61 (30.8)<br>12 (6)<br>28 (14.1)<br>60 (30.3)<br><br>10 (5.1)<br>94 (47.5)<br>87 (43.9)<br>28 (14.1)<br>40 (20.2) | <br>63 (57.8)<br><br><br><br><br><br><br>49 (44.9)<br>48 (44.03)<br>18 (16.5)<br>31 (28.4) | <br>37 (61.7)<br><br><br><br><br><br><br>34 (56.7)<br>23 (38.3)<br>9 (15)<br>4 (6.7) | 0.624<br><br><br><br><br><br><br>0.145<br>0.472<br>0.797<br>**0.001** |

**References:**

1. Park JE. Functional Movement Disorders. J Mov Disord. 2024
2. Edwards MJ, Bhatia KP. Functional movement disorders Lancet Neurol. 2012
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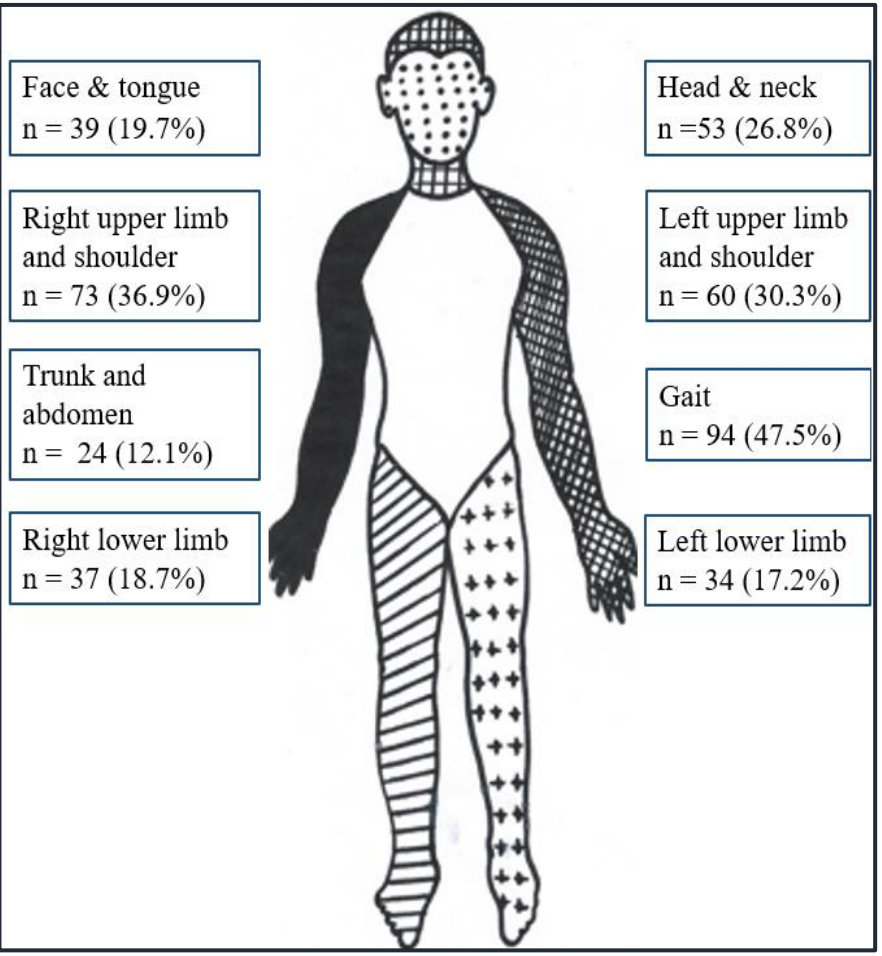


Figure 2: Body parts affected by functional movement disorders. In 85 (42.9%) patients, FMD involved multiple body parts

**Results**: One hundred and seventy (85%) had at least one identifiable predisposing factor; the commonest predisposing factor was female gender itself in 120 subjects (60.6%)

Preceding physical stress (including physical injury, surgery, physical illness or accidents) was identified as the most common precipitating factor, noted in 73 patients (36.9%)

Anxiety and hypervigilance were the most common perpetuating factors.

Table 2: FMD-relevant factors

| Variables | Whole group, n=198 | Favourable outcome during follow-up*, n=109 (%) | Unfavourable outcome, n=60 (%) | p-value |
|---|---|---|---|---|
| Any predisposing factors | 170 (85.9) | 95 (87.2) | 54 (90) | 0.430 |
| • Female | 120 (60.6) | 66 (60.6) | 40 (66.7) | 0.431 |
| • Financial strain/low socioeconomic status | 36 (18.2) | 20 (18.3) | 13 (21.7) | 0.603 |
| • Chronic neurological or psychiatric comorbidities | 102 (51.5) | 55 (50.5) | 36 (60) | 0.234 |
| • Maladaptive traits | 106 (53.5) | 61 (56) | 34 (56.7) | 0.930 |
| • Physical, sexual, or emotional trauma | 32 (16.2) | 16 (14.7) | 11 (18.3) | 0.535 |
| • Health anxiety and somatic vigilance | 19 (9.6) | 6 (5.5) | 11 (18.3) | 0.008 |
| • Neglect | 14 (7.1) | 6 (5.5) | 6 (10) | 0.276 |
| • Major losses such as bereavement or divorce | 19 (9.6) | 12 (11) | 6 (10) | 0.839 |
| Any precipitating factors | 128 (64.6) | 75 (68.8) | 33 (55) | 0.088 |
| • Physical injury/surgery/Preceding illness/Accidents | 73 (36.9) | 41 (37.6) | 20 (33.3) | 0.579 |
| • Autonomic hyperarousal event | 27 (13.6) | 15 (13.8) | 9 (15) | 0.825 |
| • Dissociation event, Interpersonal conflict | 72 (36.4) | 47 (43) | 18 (30) | 0.093 |
| • Job loss or employment-related stressors | 64 (32.3) | 41 (37.6) | 17 (28.3) | 0.224 |
| • Significant acute loss event | 11 (5.6) | 7 (6.4) | 4 (6.7) | 0.951 |
| Any perpetuating factors | 130 (65.7) | 72 (66.1) | 43 (71.7) | 0.755 |
| • Chronic pain, fatigue, Chronic medical conditions | 55 (27.8) | 26 (23.9) | 21 (35) | 0.122 |
| • Anxiety and hypervigilance, avoidance pattern | 94 (47.5) | 52 (47.7) | 32 (47) | 0.484 |
| • Interpersonal or work-related stressors, unconscious secondary gains | 90 (45.5) | 53 (48.6) | 27 (45) | 0.652 |
| • Invalidation by the healthcare system; stigma, lack of diagnostic agreement, maladaptive illness beliefs | 56 (28.3) | 31 (28.4) | 19 (31.7) | 0.660 |

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**Results**: Follow-up data after a mean duration of 5.34 ± 5.2 years, was available in 169 subjects and 109 had complete remission.

Those with complete remission had a younger age and shorter duration at presentation, hyperacute onset, weakness as presenting phenomenology, identifiable precipitating event, received counselling, and were associated with resuming routine activities. Those who failed to have complete remission had a higher frequency of unemployed status, coexistent organic neurological disorders, medical comorbidities, segmental distribution, predisposing health anxiety behaviour.

Shorter duration at presentation, hyper-acute mode of onset, and absence of any medical comorbidities were independent predictors for complete remission

Table 3: Comorbidities

| Variables | Whole group, n=198 | Favourable outcome during follow-up*, n=109 | Unfavourable outcome, n=60 (%) | p-value |
|---|---|---|---|---|
| Non-motor functional neurological symptoms: | 87 (43.9) | 51 (46) | 24 (40) | 0.249 |
| • Dysarthria | 17 (8.6) | | | |
| • Sensory/ pain | 62 (31.3) | | | |
| • Visual defects | 11 (5.6) | | | |
| • Hearing defects | 4 (2) | | | |
| • Bladder issues | 11 (5.6) | | | |
| • Ptosis | 6 (3) | | | |
| • Loss of consciousness | 23 (11.6) | | | |
| Non-neurological functional disorders: | 49 (24.7) | 26 (23.9) | 20 (33.3) | 0.185 |
| • Chest pain | 11 (5.6) | | | |
| • Respiratory difficulty | 19 (9.6) | | | |
| • Abdominal discomfort | 11 (5.6) | | | |
| • Palpitation | 3 (1.5) | | | |
| Psychiatric comorbidity | 131 (66.2) | 79 (72.5) | 39 (65) | 0.311 |
| • Depression | 83 (41.9) | | | |
| • Anxiety | 45 (22.7) | | | |
| • Schizophrenia | 6 (3) | | | |
| • BPAD | 16 (8.1) | | | |
| • Substance abuse | 13 (6.6) | | | |
| • Sleep disturbances | 99 (50) | | | |

Table 4: Multivariate regression analysis

| Variables | Odd's ratio (OR) | 95% Confidence Interval | | p-value |
|---|---|---|---|---|
| Younger age at onset | 1.45 | 0.09 | 22.91 | 0.79 |
| Younger age at presentation | 0.59 | 0.07 | 4.89 | 0.63 |
| Shorter duration of symptom | 3.48 | 1.31 | 9.19 | **0.01** |
| Unemployed status | 0.63 | 0.24 | 1.67 | 0.35 |
| Hyper-acute mode of onset | 4.84 | 1.34 | 17.49 | **0.01** |
| Weakness as presenting symptom | 3.61 | 0.74 | 17.53 | 0.11 |
| Segmental body distribution | 0.56 | 0.21 | 1.49 | 0.25 |
| Health anxiety and somatic vigilance | 0.33 | 0.08 | 1.34 | 0.12 |
| Dissociation event, Interpersonal conflict | 0.82 | 0.32 | 2.11 | 0.68 |
| Presence of coexistent neurological disorders | 2.08 | 0.81 | 5.35 | 0.13 |
| Presence of medical comorbidities | 4.65 | 1.82 | 11.91 | **<0.001** |
| Adherence to psychological counselling | 1.82 | 0.41 | 8.08 | 0.43 |
| Resumed work/ education | 2.91 | 1.13 | 7.49 | **0.03** |

**Conclusion**: Majority of FMDs showed a favorable outcome, and some of the baseline clinical features predicted long-term outcome

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1. Park JE. Functional Movement Disorders. J Mov Disord. 2024
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