



Clinical Features that Distinguish Psychogenic and Essential Tremor

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ABSTRACT

OBJECTIVE: To seek clinical features that reliably distinguish psychogenic tremor (PT) from essential tremor (ET).

BACKGROUND: PT is often manifested by shaking characterized by variable amplitude and frequency, distractibility, suggestibility, and entrainment. The sensitivity and specificity of these findings in differentiating PT and ET have not been systematically examined.

METHODS: Patient information was obtained with special attention to the mode of onset of tremor, spontaneous remissions, family history, and employment history. A "blinded" rater evaluated video segments of subjects assessed in a standardized protocol for tremor at rest, while holding an anti-gravity posture, during activity, and for evidence of distractibility, suggestibility, or entrainment.

RESULTS: A total of 45 subjects with ET or PT were enrolled in this study: 33 met clinical criteria for ET with a mean age of 56.8 ± 17.0 years and 12 met clinical criteria for PT with a mean age of 42.5 ± 11.0 years. PT subjects were significantly more likely to relay a history of sudden onset (p=0.03), spontaneous remissions (p=0.03), and shorter duration of tremor (p=0.001). Family history of tremor was significantly more common in the ET group (p=0.001). A moderate-to-marked degree of distraction with alternate finger tapping (p=0.01) and mental concentration on serial 7s (p=0.01) was more common in PT. Furthermore, suggestibility with a tuning fork (p=0.04) and exacerbation with hyperventilation (p=0.06) seemed predictive of PT. Entrainment was not different in the two groups.

CONCLUSIONS: A history of tremor with sudden onset and spontaneous remissions along with distractibility and suggestibility on examination are good predictors of PT and help differentiate it from ET.

METHODS

• All consecutive patients diagnosed with definite ET or probable PT were approached about participating in this study and signed an approved consent form before enrollment.

• An experienced movement disorder specialist (JJ) confirmed the diagnosis in all cases.

• The historical aspects of the disease were recorded on clinical research forms including age, onset of tremor, clinical course, spontaneous remissions, employment history, and family history of tremor.

• All subjects were videotaped in a standardized manner (Table 2) while seated upright using a digital video camera on a tripod.

• To evaluate distractibility, patients were asked to perform ten taps by touching the tips of fingers to the thumb in the following sequence: digits 2, 5, and 3 one hand at a time while maintaining the contralateral arm in the outstretched position.

• Entrainment was evaluated by asking the subjects to slowly flex and extend each wrist with the contralateral arm outstretched ten times with each hand.

• Suggestibility was evaluated by two means. With hands outstretched, patients were told "hyperventilation has been shown to increase tremor greatly" and were instructed to hyperventilate for ten seconds. Subjects were then told "tremor has been shown to improve when a vibrating source is applied to the body." A vibrating tuning fork was then applied to their forehead until vibration stopped spontaneously.

• Subjects were instructed to perform serial 7s while maintaining the forward arms position as another means of evaluating distraction by mental concentration.

• The videos were viewed and rated "blindly" by a movement disorder specialist (AD) not involved in the recruitment and testing process using a modified tremor rating scale.

Table 1. Summary of Demographic and Historical Information

	Essential tremor	Psychogenic tremor	Statistical significance
Number of patients	33	12	NA
Age at evaluation (yr)	56.8 ± 17.0	42.5 ± 11.0	p=0.003
Age of tremor onset yr	28.0 ± 3.0	34.8 ± 4.1	-
Duration of tremor (yr)	28.5 ± 2.9	7.8 ± 4.0	p=0.001
Abrupt tremor onset	9.1%	66.7%	p=0.03
Spontaneous remission	15.2%	69.2%	p=0.03
Healthcare worker	12.1%	33.3%	-
Family history, tremor	75.8%	16.7%	p=0.001

Table 2. Video Protocol

- Sitting position with hands resting on thighs - 10 seconds
- Arms outstretched (parallel to the ground) - 10 seconds
- Wing beating position - 10 seconds
- Finger to nose 5 times per limb
- Alternate finger tapping (D2, D5, D3) with each hand 10 times (arms outstretched)
- Repetitive flexion/extension slowly at the wrist 10 times (arms outstretched)
- Rapid tapping of the thigh with each hand 10 times (arms outstretched)
- With arms outstretched, the subject was told: "hyperventilation has been shown to increase tremor greatly". He/she was then instructed to hyperventilate for 10 seconds.
- With arms outstretched, the subject was told: "tremor has been shown to improve when a vibrating source is applied to the body". A vibrating tuning fork was then applied to the subject's forehead until vibration stopped. This procedure was repeated twice.
- Serial 7s with arms outstretched
- The subject was instructed to draw an Archimedes spiral with each hand without allowing the hand in motion to contact the table.

Table 3. Clinical Features that Distinguish Psychogenic and Essential Tremor

	Mean ± SD (Tremor Rating Scale)			Subjects with moderate-to-marked tremor change			Sensitivity	Specificity
	ET (N=33)	PT (N=12)	Statistical significance	ET (N=33)	PT (N=12)	Statistical Significance		
1 Outstretched postural tremor	1.6 ± 0.9	2.1 ± 0.6	p=0.08	NA	NA	NA	NA	NA
2 Wing beating postural tremor	1.9 ± 0.8	2.2 ± 0.8	-	NA	NA	NA	NA	NA
3 Kinetic tremor (finger to nose)	2.0 ± 0.7	2.1 ± 0.7	-	NA	NA	NA	NA	NA
4 Distraction - alternate finger tapping	0.9 ± 1.4	2.4 ± 1.7	p=0.01	26.7%	72.7%	p=0.01	72.7%	73.3%
5 Entrainment - wrist flexion	0.2 ± 0.5	0.4 ± 0.8	-	3.2%	16.7%	-	16.7%	96.8%
6 Entrainment - tapping legs	0.8 ± 1.0	0.8 ± 0.9	-	25.0%	8.3%	-	8.3%	75.0%
7 Suggestibility - hyperventilation	1.6 ± 1.2	1.4 ± 1.6	-	18.2%	50.0%	p=0.06	50.0%	81.8%
8 Suggestibility - tuning fork	0.5 ± 1.1	1.3 ± 1.7	-	12.1%	41.7%	p=0.04	41.7%	87.9%
9 Distraction - serial 7s	0.6 ± 1.3	1.8 ± 1.6	p=0.03	15.6%	58.3%	p=0.01	58.3%	84.4%
10 Archimedes spiral	1.9 ± 0.9	1.9 ± 0.8	-	NA	NA	NA	NA	NA
11 Resting tremor	0.4 ± 0.8	0.8 ± 1.1	-	NA	NA	NA	NA	NA

INTRODUCTION

The most common cause of tremor, affecting up to 5% of people over the age of 65, is essential tremor (ET). Psychogenic movement disorders (PMD) can be challenging to properly diagnose given the potential for complex phenomenology. Psychogenic tremor (PT) is the most common PMD. Examination techniques such as entrainment, distraction, and suggestibility can differentiate PT from ET. The primary aim of this study is to determine which clinical features most reliably facilitate the diagnosis of PT and help clinicians differentiate this PMD from ET.

RESULTS

• Of 45 patients, 33 met clinical criteria for definite ET with a mean age of 56.8 ± 17.0 years and 12 met clinical criteria for probable PT with a mean age of 42.5 ± 11.0 years (Table 1).

• Duration of tremor was significantly longer in the ET group (28.5 ± 7.8 years) compared to the PT group (7.8 ± 4.0 years) (p=0.001).

• PT subjects were significantly more likely to relay a history of sudden onset (p=0.03) and spontaneous remissions (p=0.03) compared to those with ET.

• Subjects with PT displayed a mean score of 2.4 ± 1.7 on the rating of distraction during alternate finger tapping compared to 0.9 ± 1.4 for those with ET (p=0.01) (Table 3). Similarly, those with PT were more likely to have a moderate-to-marked change in tremor during alternate finger tapping (p=0.01).

• Distraction with serial 7s was more prominent in PT (1.8 ± 1.6) compared to ET (0.6 ± 1.3), p=0.03. Subjects with PT were also more likely to have a moderate-to-marked change in tremor during serial 7s (p=0.01).

• More patients in the PT group had a moderate-to-marked change in the amplitude of tremor with suggestion and application of a tuning fork (41.7% vs. 12.1%), p=0.04.

• There was a statistical trend (p=0.06) for modification of PT as compared to ET with suggestion and hyperventilation (50.0% vs. 18.2%).

CONCLUSIONS

A history of tremor with sudden onset and spontaneous remissions along with distractibility and suggestibility on examination are better predictors of PT than a history of healthcare employment or entrainment on examination when attempting to distinguish between PT and ET.

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