

**LETTER TO THE EDITOR****TO THE EDITOR****Essential Tremor with Head Tremor: Trait or State?**

**Keywords:** clinical, essential tremor, head tremor, state, subtype, trait

I read with great interest the paper by Lenka and colleagues, which questions whether essential tremor (ET) with head tremor is a distinct clinical subtype of ET.<sup>1</sup> In their group of 202 ET cases without cervical dystonia, the 74 ET cases with head tremor were older, more likely to be female, had an older age of tremor onset, and were more likely to have voice tremor than the 128 ET cases without head tremor.<sup>1</sup> Based on these clinical differences, the authors consider the possibility that ET cases with head tremor have a distinct clinical phenotype.<sup>1</sup> In essence, the proposition that the authors put forth is that the presence of head tremor is a trait difference (i.e., a difference in kind). An alternative explanation is that the difference is merely one of state (i.e., a difference of degree). That is, patients with ET who develop head tremor are at a more advanced stage of disease (i.e., a more advanced state), which would explain their older age and their co-accumulation of other clinical features (e.g., voice tremor).

In our clinical-epidemiological study of ET, we enrolled 364 ET cases between 2000 and 2009.<sup>2</sup> All cases were diagnosed with

ET using Washington-Heights Inwood Genetic Study of Essential Tremor diagnostic criteria; none had dystonia.<sup>2,3</sup> We analyzed these data in order to determine whether we were able to confirm the findings reported by Lenka and colleagues.<sup>1</sup> We compared the 137 ET cases with head tremor to the 227 ET cases without head tremor (Table). The results were similar to those reported.<sup>1</sup> Essential tremor cases with head tremor were older, more likely to be female, had an older age of onset, and were more likely to have voice tremor than the cases without head tremor (Table); furthermore, those with head tremor had more severe limb tremor (i.e., higher total tremor score) and were more likely to have rest tremor on examination (Table). The interpretation of these data is of somewhat challenging. On the one hand, they are consistent with the notion that the presence of head tremor is a trait difference; on the other, they are consistent with the notion that it is a state difference. To further dissect this issue, we frequency-matched a subsample of these ET cases based on tremor duration so that ET cases with head tremor and those without head tremor had a similar duration of tremor. Even here, ET cases with head tremor were older, more likely to be female, had an older age of onset, more likely to have voice tremor and more likely to have rest tremor on examination than the cases without head tremor (Table). Tremor severity did not differ between the two groups (Table).

These data suggest that the clinical differences between ET cases with and without head tremor are independent of duration;

**Table: ET cases with vs. without head tremor: Demographic and clinical features**

	ET with Head Tremor	ET without Head Tremor	Significance (p)
Entire sample (N = 364)			
N	137	227	
Age (years)	71.9 ± 12.2 (73.0)	64.5 ± 16.2 (68.0)	<0.001 <sup>a</sup>
Age of onset (years)	46.6 ± 22.0 (50.0)	43.0 ± 22.6 (45.0)	0.012 <sup>a</sup>
Duration (years)	25.4 ± 20.2 (20.0)	21.4 ± 17.7 (16.0)	0.10 <sup>a</sup>
Female	97 (70.8)	93 (41.0)	<0.001 <sup>b</sup>
Total tremor score*	19.8 ± 8.3 (20.0)	18.2 ± 6.4 (17.0)	0.016 <sup>a</sup>
Voice tremor on examination	60 (43.8)	55 (24.2)	<0.001 <sup>b</sup>
Rest tremor on examination while seated	25 (18.2)	21 (9.3)	0.012 <sup>b</sup>
Duration-matched sample (N = 240)			
N	126	214	
Age (years)	71.2 ± 12.4 (73.0)	64.4 ± 16.4 (68.0)	<0.001 <sup>a</sup>
Age of onset (years)	49.5 ± 20.5 (51.0)	41.8 ± 22.5 (45.0)	0.002 <sup>a</sup>
Duration (years)	21.8 ± 16.7 (18.5)	22.6 ± 17.5 (18.0)	0.67 <sup>a</sup>
Female	92 (73.0)	91 (42.5)	<0.001 <sup>b</sup>
Total tremor score*	19.0 ± 8.2 (19.5)	18.4 ± 6.3 (17.5)	0.249 <sup>a</sup>
Voice tremor on examination	53 (42.1)	54 (25.2)	<0.001 <sup>b</sup>
Rest tremor on examination while seated	21 (16.7)	20 (9.3)	0.045 <sup>b</sup>

N = number.

Values represent mean ± standard deviation (median) or number (percentage).

<sup>a</sup>Mann-Whitney test.

<sup>b</sup>Chi-square test.

\*Based on twelve 0-3 ratings of postural and kinetic tremor on examination; range = 0 - 36.

that is, they seem to be a trait difference. While this may be the case, substantial data indicate that tremor severity tends to increase with time in ET cases,<sup>4</sup> and ET cases accumulate other clinical features (e.g., rest tremor, voice tremor) with the passage of time.<sup>5,6</sup> One of these accumulating features is head tremor.<sup>6,7</sup> Hence, the presence of head tremor in ET may be both a trait difference as well as a state difference. It may be that it is a trait difference in the ET cases who develop head tremor early in the course of their disease and a state difference in those who develop it later in their disease. Indeed, prior analyses from a smaller sample of our data set indicate that this might be the case.<sup>8</sup>

The search for clinical subtypes of ET continues, and the paper under discussion offers additional insights. It is hoped that, when identified, the stratification by such subtypes will yield better insights into disease pathophysiology and improved pharmacotherapeutic options.

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