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Article

Clinical Features of Essential Tremor in the Two Ethnic Groups

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Abstract: Objective: The aim of the study was to study the clinical features of essential tremor (ET) in residents of the Republic of Sakha (Yakutia) in various ethnic groups.

Material and methods. The study involved 53 patients with an established diagnosis of essential tremor. All patients underwent a detailed neurological examination with a quantitative assessment of the severity and severity of tremor, as well as the degree of maladjustment and activity in everyday life using unified scales.

Results and Discussions. It was revealed that the clinical variant of essential tremor-plus, associated with a more severe course and disability of patients. In the representatives of the Russian ethnic group, with the classic version of essential tremor, a combination of head tremor and hand tremor is observed, as well as a more rapid progression of disease symptoms. Representatives of the Yakut ethnic group in the clinical picture of essential tremor -plus are statistically significantly more likely to have a dystonic head position.

Conclusion. Clinical variability of essential tremor with differences in the ethnic aspect in the rate of progression and in the frequency of the combination of action tremor with dystonic head position was demonstrated.

Keywords: *essential tremor; essential tremor-plus; trembling hyperkinesis; motor symptoms.*

Introduction

Essential tremor (ET) is a chronic, genetically determined disease of the nervous system that manifests itself as a progressive bilateral tremor of action [1]. Moreover, ET is considered the most common disease of the extrapyramidal system and the most common cause of tremor in clinical practice [2].

Since Burresi first described the term "essential essential tremor" there much has been revised [3]. Long-term study and observation of patients has led to the conclusion that ET has a more "complex" structure than expected and today there is no doubt about the heterogeneity of clinical manifestations of ET with a wide range of motor and non-motor symptoms [4–10]. Since 2018, new diagnostic criteria for ET, proposed by the International Movement Disorders Society (MDS), have been introduced. Thus, a classic form of the disease is distinguished, which is represented by a progressive bilateral action tremor of the hands, lasting at least 3 years [11]. In addition, the term essential tremor plus (ET-plus) has been proposed, which is represented by a combination of classic action tremor of various localization and other motor symptoms (tremor at rest, mild

hypokinesia, dystonic head position, tandem walking disorder, intentional tremor, etc.), which in their severity they are always inferior to tremulous hyperkinesis [11].

The "core" of the disease is tremulous hyperkinesis, which determines the severity of the disease and the quality of life of patients (link). Tremor heterogeneity is characteristic, which is represented by a combination of kinetic tremor with postural and intentional tremors, as well as resting tremor [12]. Localization of tremor in 95% of cases is observed in the upper extremities; can be combined with tremors of the head, voice, legs, trunk, lower jaw, facial muscles [13]. In addition, with ET, there is a variability in the age of onset and a "model" of the course of the disease [14]. The disease can begin at any age, manifesting with tremors of the upper extremities, gradually increasing in amplitude and spreading to other parts of the body, causing limitation of daily activity and self-care of patients [2].

Objective

The aim of the study is to comparatively analyze the clinical features of essential tremor in two ethnic groups.

Materials and Methods

The main group included 53 patients with an established diagnosis of ET, aged 21 to 89 years, the median age was 67 [55.5; 72.5] years. By gender, the distribution was as follows: 19 (35.8%) men and 34 (64.2%) women. The patients were divided into 2 subgroups. The first subgroup consisted of 22 (41.5%) patients with ET of Yakut ethnicity. The second subgroup included 31 (58.5%) patients with ET of Russian ethnicity. All patients were registered with a neurologist at the Center for Extrapyramidal Disorders and Botulinum Therapy at the M.K. Ammosov North-Eastern Federal University. The diagnosis and clinical form of ET were determined based on the MDS diagnostic criteria (2018). After a thorough collection of complaints and anamnesis, all patients underwent a neurological examination using the generally accepted method of standard neurological examination. The Fahn-Tolosa-Marin tremor scale (FTM, 1993), which was subsequently validated [15,16], was used to quantify the severity of tremors of various localization, functional disorders and disability associated with tremor. The maximum FTM score is 144 points. In addition, a weighted scale for assessing the severity of essential tremor was used to assess the severity of tremors of various localization and functional disorders [17]. The maximum possible score is 336 points. To assess maladjustment and activity in everyday life, a special scale for patients with tremor was used [18]. Statistical processing of the research results was carried out using the SPSS Statistics 22 software. Data distribution was assessed by the Shapiro – Wilk, Kolmogorov – Smirnov tests and the analysis of quantile diagrams. The boundaries of the expected deviations were characterized by the calculation of the 95% confidence interval. Descriptive statistics for quantitative data are given as the median and the 25th and 75th quantiles (Me [Q25; Q75]). To compare two independent groups, the analysis was performed using the Mann-Whitney U-test. When comparing qualitative data, $\chi 2$ and Fisher's exact test were used. To calculate the quantitative probability of an outcome depending on factors, a relative

chance (OR, or OR - odds ratio) was used with a 95% confidence interval (CI). Correlation analysis was carried out using Spearman's coefficient. The critical level of statistical significance for the two groups was determined at $p \leq 0.05$.

Results

The clinical variant of ET-plus was diagnosed in 18 (81.2%) representatives of the first group and in 27 (87.1%) patients of the second group. The total number of patients with the ET-plus variant was 45 (84.9%). Early onset of the disease (up to 60 years inclusive) was detected in the Yakut ethnic group of patients with ET in 17 (50%) individuals, in the Russian ethnic group - in 23 (74.2%) patients (p = 1, 0). The duration of the disease in patients of the first (Yakut ethnicity) group ranged from 3 to 60 years, the median was 11.0 [5.8; 25.8] years; in patients of the Russian ethnic group, the duration of the disease varied from 3.5 to 69 years, the median was 15.0 [6.0; 29.0] years (p = 0.49). Family history was observed in 13 (59.1%) and 15 (48.4%) individuals of the first and second groups of patients with ET, respectively (p = 0.44).

According to the diagnostic criteria for ET, all patients had a kinetic-postural tremor of the hands. When assessing the amplitude of tremulous hyperkinesis, the most frequently observed medium-amplitude tremor, which somewhat prevailed in the Russian ethnic group. However, the distribution of the severity of tremor did not have statistically significant differences in ethnicity (p = 0.33).

The combination of kinetic-postural tremors of the hands and head statistically significantly prevailed in the Russian ethnic group (27/31 people (87.1 ± 6.02%) versus 14/22 people (p = 0.04). Resting tremor was diagnosed in 5 (22.7%) patients of the first group and in 8 (25.8%) patients of the second group (p = 0.79). Vocal cord tremor was detected in 10 (45.5%) representatives of the Yakut ethnic and in 16 (51.6%) the Russian ethnic groups (p = 0.66). Tremor was diagnosed in 3 (13.6%) patients of the Yakut ethnic group and 1 (3.2%) patient of the Russian ethnic group (p = 0.16). The presence of leg tremor in the clinical picture was detected in 7 (31.8%) patients of the first group, as well as in 14 (45.2%) patients of the second group of patients with ET (p = 0, 33) Chin tremor was diagnosed in 2 (9.1%) and 3 (9.7%) representatives of the first and second groups of patients with ET, respectively (p = 0.94). %) representatives of the Yakut ethnic gruop and in 1 (3.2%) patient with ET of the Russian ethnic group (p = 0.36).

The sum of points on the FTM scales and the weighted assessment of tremor, as well as activity in daily life, did not statistically significantly differ between the first and second groups of patients (p> 0.05) (Table 1).

We did not obtain statistically significant differences in the severity of tremor and the degree of disability depending on the form and age of the onset of the disease in patients of the first and second groups (Table 2).

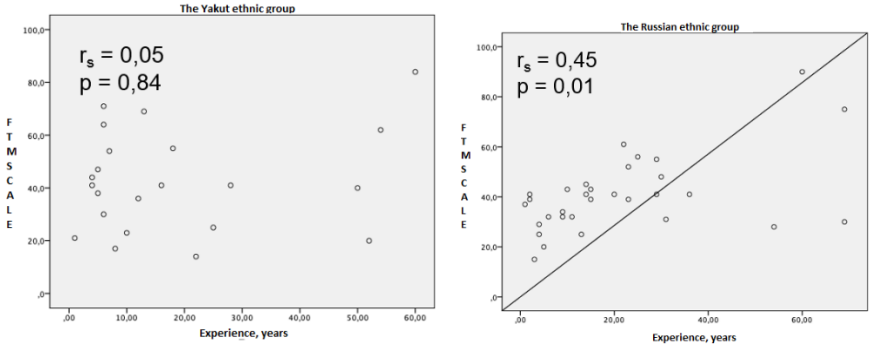
Table 1. Distribution of patients of the Yakut ethnic and the Russian ethnic groups according to the results of a quantitative analysis of tremulous hyperkinesis in patients with ET, Me [Q25; Q75] points

Parameter	**The Yakut ethnic group, n = 22**	**The Russian ethnic group, n = 31**	**Statistical criteria**
FTM scale	41,0 [24,5; 56,7]	40,0 [31,7; 45,7]	p = 0,76
Weighted tremor rating scale	120,0 [86,5; 141,0]	120,0 [84,7; 144,0]	p = 0,96
Activity in daily life scale	21,0 [7,5; 35,2]	18,0 [7,0; 27,2]	p = 0,47

Table 2. Distribution of the assessment of the severity of tremor and maladjustment by the forms and age of the onset of ET, Me [Q25; Q75] points

Parameter	**Familial form, n = 28**	**Sporadic form, n = 24**	**p**	**Early onset, n = 40**	**Late onset, n = 12**	**p**
FTM scale	40,0 [30,25; 55,0]	41,0 [30,5; 46,0]	0,52	41,0 [30,0; 55,0]	40,0 [33,2; 43,7]	0,5
Weighted tremor rating scale	120,0 [90,5; 172,7]	120,0 [71,5; 127,7]	0,31	120,0 [84,2; 152,2]	120,0 [87,0; 126,0]	0,79
Activity in daily life scale	20,5 [8,2; 39,7]	18,5 [6,2; 21,7]	0,25	20,0 [7,25; 36,0]	20,5 [7,25; 21,0]	0,5

Correlation analysis between the length of illness and the severity of the disease on the FTM scale revealed the presence of a moderate direct correlation ((rs = 0.45; p = 0.01) only in the Russian ethnic group, while there was no such in the Yakut group (Figure 1).



a b

Figure 1. Correlation analysis of the severity and functional disorders of ET on the FTM scale and the length of the illness: A - Yakut ethnic group; B - Russian ethnic group

In the structure of the clinical picture of ET-plus, intentional tremor of the hands and mild dystonic head position were most often diagnosed. Dystonic head position statistically significantly prevailed in patients of the Yakut ethnic group with an increase in the relative chance of 3.14 times (95% CI: 0.9-10.86) (Table 3).

Table 3. The structure of additional extrapyramidal phenomena in ET-plus by ethnicity, abs.

Localization of tremor	**The Yakut ethnic group n = 18**	**The Russian ethnic group n = 27**	**Statistical criteria**
Intentional tremor	14 (77,8%)	22 (81,5%)	p = 0,55
Rest tremor	5 (27,8%)	8 (29,6%)	p = 0,71
Dystonic position	**11 (61,1%)**	**9 (33,3%)**	**p = 0,03**
Mild hypokinesia	5 (27,8%)	3 (11,1%)	p = 0,11
Tandem walking disorder	2 (11,1%)	5 (18,5%)	p = 0,58

The median age of ET-plus patients with resting tremor was 68 [65; 71.5] years, but there was a difference in the duration of the disease in the studied groups. Thus, in the first (Yakut ethnic) group, patients with resting tremor were characterized by a shorter length of illness (6.5 [4.5; 15.3] years versus 21.0 [11.3; 32.8] years in the second group (p = 0.07).

According to the data obtained, the clinical version of ET-plus is associated with a more severe course of the disease and more pronounced maladjustment than classical ET (p <0.05) (Table 4).

Table 4. Distribution of assessment of severity of tremor and maladjustment by clinical variants of ET, Me [Q25; Q75] points

Parameter	Classic ET, n = 7	ET-plus, n = 45	p
FTM scale	23,0 [20,0; 37,0]	41,0 [32,0; 54,5]	p = 0,005
Weighted tremor rating scale	70,0 [45,0; 100,0]	120,0 [92,0; 151,5]	p = 0,003
Activity in daily life scale	6,0 [1,0; 17,0]	21,0 [9,0; 35,5]	p = 0,019

In the course of this study, we analyzed motor symptoms among ET patients in an ethnic aspect. As a result of the study, it was found that patients of the Russian ethnic group were statistically significantly more likely to have a combination of action tremor and head tremor, as well as a progressive course of the disease. There were no statistically significant differences in the severity of tremor, the form of ET and the age of onset of the disease in the ethnic aspect. It was revealed that among the cases of ET, the clinical variant ET-plus (84.9%) predominates, which is associated with a more severe course of the disease and disability of patients. In the group studied by us, 6 patients with ET (11.3%) had disabling tremor. In the clinical structure of ET-plus, a combination of tremulous hyperkinesis with a dystonic head position was observed in patients of the Yakut ethnic group with an increase in the relative chance of its development by 3.14 times. In the same group, early addition of resting tremor was revealed, but without statistically significant differences.

Conclusion

We found that the clinical form of ET-plus, associated with a more severe course and disability of patients, prevailed in the study group. The relationship between the severity of motor manifestations of essential tremor and ethnicity is shown. In the representatives of the Russian ethnic group, with the classic variant of essential tremor, a combination of head tremor and action tremor of the hands is observed, as well as a more rapid progression of the symptoms of the disease. Representatives of the Yakut ethnic group in the clinical picture of ET-plus are statistically significantly more likely to have a dystonic head position with a predominance of the stationary type of disease course.

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