

# The symptomatology of tic disorders and concomitant sleep habits in children

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## Abstract

**Introduction:** The aim of study was to analyze the clinical symptoms of tic disorders (TG) and sleep habits in children. The sleep habits were compared with those of a control group (CG).

**Materials and methods:** The study included 84 children with TG. The diagnoses were verified according to DSM-IVR criterion. CG included 156 healthy children. The parents filled in a questionnaire developed by the authors – TG's parents filled in a part concerning the symptomatology of tic disorders and sleep habits, CG's parents only the second part.

**Results:** There were 78.6% of male and 21.4% of female in TG respectively, and 53.8% and 46.2% in CG. The simple and complex motor tics were observed in 98.8% and 39.3% of patients, vocal tics – 64.3%, sensory tics – 20.2%. ADHD and OCD symptoms were noticed respectively in 73.8% and 35.7% of children. The most common simple and complex motor tics were respectively: blinking – 69.0%, jumping and touching – 20.2% of patients. Vocal tics were presented in 64.3%. 23.8% of TG slept together with another person in bed, and 69% of them in one room with other members of family; in CG it was respectively 58.1% and 19.2%. 33.3% of TG fell asleep and woke up in the same position in bed, in the CG 75.6% of children slept calmly. The bed-time stories were seldom read by the parents in TG – 3.6% vs CG – 31.4%.

**Conclusions:** Quote frequently TG are connected with other behavioral symptoms, in particular ADHD and OCD. Sleep habits are different in TG than in CG.

**Key words:** tic disorders, sleep habits, children.

## Introduction

In 1885 Geroges Albert Edouard Brutus Gilles de la Tourette (1857-1904) for the first time described a syndrome characterized by involuntary movements and concomitant echolalia and coprolalia. The complex of symptoms was termed by him as a tic disorder [1,2]. By 1965 there were only 50 patients suffering from Tourette's Syndrome (TS) described in professional literature [1]. In the 1970s, scientist noticed that TS was one of the most common causes of tics. The frequency of tic disorders (TG) is evaluated as 1-3% of the general population (except transient motor or phonic tics) [3,4]. The male-to-female ratio in TG is approximately 4:1 [3]. The disorder is clearly manifested by the age of 11 in almost all of patients [5]. The aim of the study was to characterize the clinical manifestation and sleep habits in children with TG.

## Material and methods

The analysis was conducted on a group of 84 patients at the age of 12.1±3.6 years admitted to the Department of Developmental Neurology and to the hospital's outpatient clinic to diagnose and treat TG. The researchers analyzed the symptomatology of tics and verified the diagnoses according to DSM-IV R criterion. The parents of the patients filled in a questionnaire developed by the authors, which consisted of two parts. One part concerned the symptomatology of tic disorders, the other – habits connected with sleep. The control group (CG) included 156 healthy children in similar age, whose parents filled in only the part concerning the sleep habits. All investigators were trained to ensure the quality of responses and they were present when the questionnaires were filled in. The  $\chi^2$  test was used to statistical analyses.

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**Table 1. Group Characteristic**

	Group of tics	Control group
n	84	156
Mean age	12.1	9.6
Age standard deviation	3.6	4.2
Females	21.4%	53.8%
Males	78.6%	46.2%

**Table 2. Clinical manifestation of tics**

	n	%
Simple motor tics	83	98.8
Vocal tics	54	64.3
Complex motor tics	33	39.3
Sensory tics	17	20.2
ADHD symptoms	62	73.8
OCD symptoms	30	35.7

## Results

There were 66 male (78.6%) and 18 female (21.4%) children in the TG group and respectively 84 (53.8%) and 72 (46.2%) in the CG. The mean age of the TG and the CG was similar i.e. appropriately  $12.1 \pm 3.6$  and  $9.6 \pm 4.2$  years. The characteristic of the groups is shown in *Tab. 1*. In our study, the simple and complex motor tics were observed respectively in 83 (98.8%) and 33 (39.3%) patients, vocal tics in 54 cases (64.3%) and sensory tics in 17 children (20.2%). The Attention Deficit Hyperactivity Disorder (ADHD) symptoms were noticed in 62 children (73.8%), whereas the obsessive-compulsive disorders (OCD) symptoms were occurring in 30 children (35.7%). The types of clinical manifestations of tics and comorbidity syndromes are shown in *Tab. 2*. The most common simple and complex motor tics appearing in the study group were blinking and head twisting in 58 (69.0%) and in 49 (58.3%) children respectively, whereas jumping and touching objects equally in 17 (20.2%) patients. The complete list of simple motor tics observed in the study group is presented in *Tab. 3*. Vocal tics were presented in 54 (64.3%) cases, and the most frequently observed included: throat cleaning and sniffing in 36 (42.9%) and 25 (29.8%) children, respectively. A feature distinctive of TS i.e. coprolalia, appeared in 10 (11.9%) patients. The symptomatology of the simple and complex vocal tics is shown in *Tab. 4*. In our study, 23.8% of children with TG slept together with another person in the bed, and about 69% of patients slept in one room with other members of family, in the CG it was respectively 58.1% and 19.2% but neither of differences was significant. 33.3% of patients with tics fell asleep and woke up in the same position in bed, while 75.6% of children in the CG slept calmly. Parent's presence was necessary to put a child to sleep in approx. 10.9% of cases in the CG, but only in 6% of patients with tics. The bed-time stories were seldom read by the parents in the TG and much more often in the CG – 3.6% vs 31.4%. This difference was significant. More children with tics (9.5% vs 8.3%) fell asleep when watching TV. Only 6% of patients needed a soft

**Table 3. Symptomatology of motor tics**

Simple motor tics	Blinking	58	69.0
Head twisting		49	58.3
Clenching eyes		40	47.6
Hand movement		37	44.0
Face grimacing		35	41.7
Shoulder shrugging		35	41.7
Mouth grimacing		33	49.3
Leg movement		30	35.7
Head turning		27	32.1
Complex motor tics	Jumping	17	20.2
Touching objects		17	20.2
Echopraxis		11	13.1
Copropaxis		7	8.3

**Table 4. Symptomatology of vocal tics**

	n	%
Throat cleaning	36	42.9
Sniffing	25	29.8
Throaty sounds	18	21.4
Shouting	18	21.4
Loudly sighing	14	16.7
Echolalia	12	14.3
Gulping	11	13.1
Coprolalia	10	11.9
Loudly breathing	8	9.5
Hooting	7	8.3

**Table 5. Sleep habits and naps**

	Group with tics	Control group
Sleep in one bed	23.8%	19.2%
Sleep in one room	69.0%	58.3%
Parent's presence	11.7%	19.7%
Watching TV	9.5%	8.3%
The same place in bed during all night	33.3%**	75.6%**
Parents reading	3.6%**	31.4%**
Soft toy	6.0%**	44.9%**
Day naps	29.8%**	12.8%**

\* $p < 0.05$ ; \*\*  $p < 0.005$ .

toy to fall asleep, while in the CG almost 45% had favorite cuddly toys. This difference was significant. The day naps were statistically more frequent in children with tics – 29.8% whereas only 12.8% of healthy children slept during the day. The sleep habits and naps are shown in *Tab. 5*.

## Discussion

Chang et al. reported that the most common simple motor tics were blinking (65.1%) and head twisting (32.6%) [6]. In the studied group, the most frequent tics also included blinking, which occurred in 69.0% children and head twisting, which

occurred in 58.3% of them. In the literature the most common complex motor tics were touching different objects, crouching, jumping and skipping [1,5,7]. Those types of tics occurred in 39.3 % of children with tics. The most frequent were jumping and touching objects described in 20.2% of patients. Chang et al. reported that the most common vocal tics were throat cleaning (32%) [6]. In the studied group, throat cleaning appeared in 42.9%. Complex vocal tics as shouting of obscenities, profanities or otherwise socially inappropriate words or phrases termed coprolalia occurred in 10-30% patients with TS. Those symptoms were observed in 11.9% of children in the studied group. Coprolalia is very characteristic for TS, but not as frequent as it is thought to be, especially in the population of children [5,7]. Sensory tics refer to repeated, unwanted, uncomfortable sensations, often in the absence of a verifiable stimulus [5]. This type of tics appeared in 20.2% of children. The occurrences of ADHD symptoms are more frequent in children with tic disorders than in the general population [8]. It's characteristic that comorbidity of these diseases is observed in 20-90% of patients. Teive et al. reported that ADHD coexisted with tics, especially with TS, in 38,6% and Budman et al. evaluated this correlation as 77% [1,9]. In the studied group, the components of ADHD were noticed in 73.8% of children with tics, all of them were verified according to DSM-IV criterion and ICD-10 used in Europe [8]. The occurrence of both diseases i.e. obsessive-compulsive disorders (OCD) and tic disorders is observed in 28-67% [5]. Teive et al. noticed that OCD coexisted with TS in 38,6% whereas Budman et al. estimated that on 52% [9]. In the studied group, the aforementioned symptoms occurred in 35.7% of patients. Sleep disorders connected with tic disorders manifest themselves by problems with falling asleep. It concerns 44-80% of patients [10]. In the studied group, sleep disorders (mainly night terror) were observed in 5 patients (4,1%). All of them were verified with the aid of DSM-IV criterion. Sleep habits and sleep disorders in children population are rarely described in literature. Their occurrence is evaluated as 25%-30% of the population. Our investigation revealed that sleep habits are different in the group of children with tics and in the CG. In the literature there are no other studies which compare sleep habits in the above-mentioned populations of children. The prevalence of sleep habits as sleeping in one room or bed with another person, watching TV when falling asleep was higher but not significantly, in the group with tic disorders

than in the CG. The naps were significantly more frequent in children with tics. Statistically more frequently healthy children had soft toys when falling asleep, listened to bed-time stories read by a parent and slept all night in the same position in bed. The education of the parents is a basic way to modify habits connected with sleep of children. It's necessary to prevent more serious sleep problems and to improve the social functioning of the children, especially with TG, during the day [10].

## Conclusion

Children with TG exhibited a variety of behavioral symptoms, particularly ADHD and OCD. Sleep habits were also different in this group than in healthy children. Therefore it seems that the comorbid behavioral conditions are interfered with education and social functioning more than tics alone.

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