International Journal of Contemporary Pediatrics
Revathi N et al. Int J Contemp Pediatr. 2023 Aug;10(8):1211-1215
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: https://dx.doi.org/10.18203/2349-3291.ijcp20232236

Original Research Article

Clinical correlates, characteristics and comorbidities of paediatric tic disorders

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Received: 06 June 2023
Revised: 07 July 2023
Accepted: 10 July 2023

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ABSTRACT

Background: Tic disorders are complex neuropsychiatric disorders of childhood onset. The associated comorbidities in paediatric tic disorders are of vast importance as they account for the major functional impairment in these children, data of which is lacking in our Indian context.
Methods: Descriptive Cross-sectional study conducted among children of 3-15 years of age in child psychiatry department of Institute of Child health, Egmore, Chennai
Results: In this study 60 patients were studied of whom 47 were male and 13 were females. Comorbid psychiatric disorders were present in 38 (63.3%) children. They were ADHD (48.3%), OCD (6.6%), ASD (6.6%), SLD (20%), Behavioural problems in 16.6%. Motor tics were the most common type of tics. Significant correlation between tic severity and presence of comorbid psychiatric disorders was seen.
Conclusions: Tic disorders are not completely benign and simple as it is thought. Tic disorders usually present with associated comorbidities, which cause more impairment than tics themselves. ADHD is the most common comorbidity associated with paediatric tic disorders.

Keywords: Tic disorders, Comorbid disorders, ADHD, Motor tics, SLD

INTRODUCTION

Tic disorders are complex, heterogenous, neuropsychiatric disorders of childhood onset that are the manifestations of the complex interplay between genes and environment.[1,2] Since 1885, when the French neurologist, Gilles de la Tourette first recognized and described Tourette syndrome, the best known of tic disorders so far, there has been rapid research and advancement in medical field to understand the aetiology, genetics, neuroanatomy and epidemiology of tic disorders.[3,4] No longer tic disorders are viewed as rare, bizarre psychopathological entity. In the recent years, comorbid psychiatric disorders that frequently accompany tic disorders have become the point of research interest.

Tics usually have their onset between 4-6 years, peak in severity around 10-12 years and by 18-20 years of age (early adulthood) most of them have a marked reduction in their tic severity, with an exception of a small percentage (<5%) of patients experiencing worsening of tics into adulthood.[5,6] Tics change in their frequency, number, type, anatomical location, complexity and severity over period of time with tic free intervals of weeks to months in between.[7] Since the past decade, the neurological and psychiatric comorbidities associated with tic disorders has received must interest and been the point of research. But till the relationship between tic disorders and comorbid psychiatric disorders has not been disentangled. It is also of note that more severe the tic disorder, the greater the

likelihood of co-occurring conditions both in clinically referred and population-based samples.[8,9] The most common comorbidity associated with tic disorders is ADHD. ADHD is characterized by the presence of enduring pattern of inappropriate inattention and/or hyperactivity and impulsive behaviour. The prevalence rate of ADHD in the general population being 2-12%, in clinical samples of tic disorders the co-occurrence of ADHD[9] ranges from 30-50%. It has also been rated that the prevalence of ADHD in children with TS who reach clinical attention may be even higher, with some pointing around 60-90%.[10] There occurs a bidirectional relationship between ADHD and TS as 50-75% of children with TS also meet criteria for ADHD, around 20% of ADHD children also meet criteria for tic disorder. Hence the primary objective was to study the clinical correlates and characteristics of tics in children between age group of 3-15 years who are diagnosed to have tic disorders and secondary objective was to determine the associated comorbid psychiatric disorders in these children.

METHODS

This was a descriptive- cross sectional study conducted in the child psychiatry; outpatient department, institute of child health and hospital for children, Egmore from September 2016 to September 2017 with a convenient sample size of 60 children calculated by non-probable sampling.

Inclusion criteria

All children between 3-15 years of age diagnosed to be having tic disorders according to DSM 5 diagnostic criteria and in follow up from 2012 in the child psychiatry department of ICH were included.

Exclusion criteria

Children with known genetic disease, Children with known neurological disorders and Children with history of substance abuse or on medications known to precipitate tics were excluded.

The primary aim was to study the clinical correlates and characteristics of tics in children between age group of 3-15 years who are diagnosed to have tic disorders according to DSM-5 diagnostic criteria and secondary objective was to determine the associated comorbid psychiatric disorders in these children. Written informed consent was obtained from all parents and institution review board clearance was obtained. Detailed clinical history of the child was elicited using a structured proforma. YGTSS (Yale Global Tic Severity Scale) was scored for every patient. History was counter checked with previous records wherever feasible. Vanderbilt ADHD parent rating scale was coded for each child to look for associated attention deficit hyperactivity disorder. Indian scale for assessment of autism (ISAA) was scored to recognize the associated Autistic spectrum disorder. CBCL (Child behaviour checklist), a parent rating scale, to diagnose the underlying behavioural problems was scored.CY-BOCS (children yale-brown obsessive-compulsive scale) was scored to diagnose the obsessive-compulsive disorders. The diagnosis of all these associated comorbidities was accomplished with the help of trained psychologist. Diagnosis of comorbid disorders was confirmed by child psychiatrist.

Statistical analysis

All data were entered in Microsoft excel sheet and was imported to SPSS software. All analysis were performed using SPSS, Version 20.0 Descriptive statistics was done for all data and were reported in terms of frequency mean values and percentage. Chi square test was performed to find out the significance of correlation between the data and p value of <0.05 was considered statistically significant. The means of the groups were compared by independent t test.

RESULTS

The study was conducted over a period of 1 year in the child psychiatry department of a tertiary care centre. A total of 60 children who were diagnosed and were in treatment and follow up were studied. Of the 60 children 47 (78.3%) were males and 13 (21.7%) were female children (Table 1).

Table 1: Sex distribution of study population.

Sex	N	%
Male	47	78.3
Female	13	21.7

Table 2: Age distribution of study population.

Age (years)	N	%
3-6	7	11.7
7-10	36	60.0
11-15	17	28.3

This observation was similar to the previous studies, all of which showed a male preponderance.[13-16] The study group was divided into three groups, 3 to 6 years; 7 children (11.7%), 7 to 10 years; 36 (60%), 11 to 15 years; 17 (28.3%) children. The children were also divided into three groups based on the age of diagnosis of tic disorders. Of the 60 children 9 children (15%) were diagnosed between 3to 6 years, 43 (71.7%) were diagnosed between 7 to 10 years and 8 children (13.3%) were diagnosed between 11 to 15 years. Out of the 60 children, only 5 (8.3%) had preceding history of sore throat before the onset of tics. Among the study population, motor tics were the most common type of tics seen in 42 children (70%), vocal tics in 4 (6.7%) and both vocal & motor tics in 14 (23.3%) of them (Figure 1). Out of the 60 children 5 (8.3%) experienced premonitory urge prior to the onset of tics, relief of this urge after tic onset was seen in 4 (6.7%) of them. Among the study population 24 (40%) children gave

history of ability to suppress tics voluntarily, 19 children (31.7%) had specific exacerbating factors which aggravated the tics, of which playing video games (11%) were the most common and doing homework (10%) was the second commonest. Out of the 60 children, only 6 (10%) gave history of relieving factors like engaging in sport activities which relieved the tics. According to the Yale Global Tic Severity scale (YGTSS), the tic severity was scored (Figure 2).

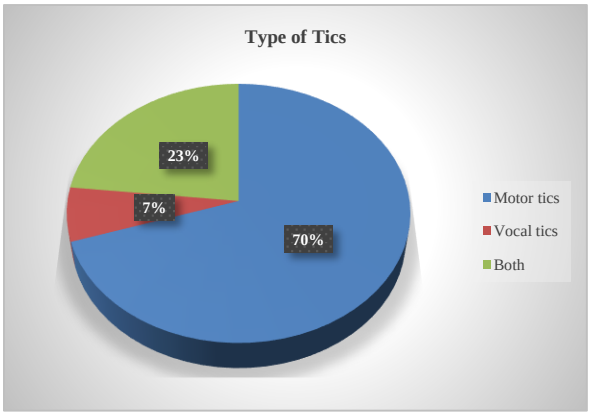

Figure 1: Type of tics.

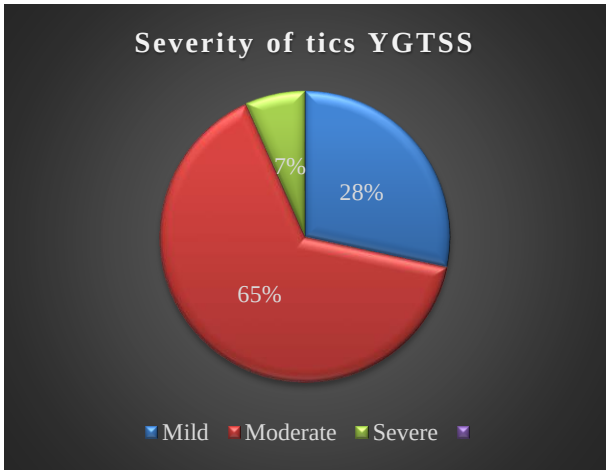

Figure 2: Severity of tics according to YGTSS (Yale global tic severity scale).

Among the study population, 30 (50%) children did not have any educational problem and some children had more than one educational problem. Poor progress in school was the common problem encountered in 20 children (33.3%). Out of 60 children, 23 (29%) were taking treatment with drugs for tic disorder and other comorbid problems, of which 5 (8%) children reported side effects like excessive sleepiness. One child had developed drug induced hepatitis. Out of the study population,22 did not have any associated comorbid illness. Many children had more than one associated psychiatric disorder. ADHD was the most common comorbidity in around 29 (48.3%) children, SLD (specific learning disorder) was the second commonest (20%). Others were behavioural problems like self-injurious behaviour in 10 children, rage attacks and sleep disturbances in 5 of them each, OCD (obsessive compulsive disorder), ASD (autistic spectrum disorder) and others were present in 4 of them each (Table 3). When the type of tics was compared with the impairment score on YGTSS, highly significant p value (p=0.000) was found (Table 4). This indicates that when both tics were present (motor & vocal), the impairment scores were high compared with either tic alone.

Table 3: Associated comorbid psychiatric disorder.

Comorbid psychiatric disorder	N	%
ADHD	29	48.3
OCD	4	6.6
ASD	4	6.6
SLD	12	20
Behavioural problems	10	16
Rage attacks	5	8.3
Sleep disturbances	5	8.3
Others	4	6.6
None	22	36.6

Table 4: Comparison between type of tics and impairment scores (n=60).

Type of tics	N	95% confidence interval	Impairment scores Min-Max	P value
Motor	42	8.8-12.16	0- 20	0.000
Vocal	4	4.54-20.46	10- 20	
Both	14	14.12-23.02	10-30	
Total	60	10.74-14.26	0-30	

Tic severity based on impairment scores on YGTSS was compared with presence of comorbid psychiatric disorders and significance of correlation between the groups were analysed using Chi square test and p value (Table 3). When ADHD was compared with tic severity out of the 4 children with severe tics all 4 (100%) has associated ADHD and of 39 children with moderate tics 22 (56.4%) had ADHD. This showed a statistically significant association between ADHD and tic severity (p value 0.033) (Table 5).

Similarly, all other comorbid psychiatric disorders presence was compared with tic severity like OCD (obsessive compulsive disorder), ASD (autistic spectrum disorder), Specific learning disorder, rage attacks, sleep disturbances and behavioural problems. Of which presence of behavioural problems was statistically associated with tic severity with significant p value of 0.030. When tic severity was compared with overall presence of comorbid disorders, it was evident that out of 4 children with severe tics all 4 had comorbid problems and out of 39 children with moderate tics 28(71.8%) had comorbid psychiatric disorders was found to be statistically significant with p value of 0.010. When presence of educational problems was compared with tic severity, statistically significant association was found between the groups with p value of 0.033.

Table 5: Comorbid psychiatric disorders associated with tic severity.

Comorbidities	Tic severity (based on YGTSS scores)			P value
	Mild	Moderate	Severe	
ADHD				
Yes	3	22	4	0.003
No	14	17	0	
OCD				
Yes	1	3	0	0.83
No	16	36	4	
ASD (Autism)				
Yes	2	2	0	0.564
No	15	37	4	
Specific learning disorder				
Yes	2	8	2	0.226
No	15	31	2	
Behavioural problems				
Yes	0	8	2	0.030
No	17	31	2	
Rage attacks				
Yes	0	5	0	0.230
No	17	39	4	
Comorbid psychiatric disorder				
Yes	6	28	4	0.010
No	11	11	0	
Educational problems				
Yes	4	24	2	0.033
No	13	15	2	

Linear relationship between tic severity score and comorbidity score

The comorbid disorders in children were given scores, for example, those who had a single comorbidity were given score as one, those with two comorbidities were given score 2 and so on. A significant linear relationship existed between the tic severity score and comorbidity score.

DISCUSSION

Tic disorders are common in childhood with a varying prevalence rate[11] from 6-18%. It is not completely benign and simple as it is thought to be by the practising paediatricians. Tic disorders usually present with other associated comorbidities[12] which produce more impairment to the child both socially and functionally. This study was done to study the clinical characteristics of paediatric tic disorders and their associated comorbid psychiatric disorders in a group of 60 children diagnosed with tic disorders and are in follow up in a tertiary care hospital. The study took into account various clinical characteristics of tics and examined the children for many comorbidities (around nine). The major findings in the study were most of the parents did not notice the presence of comorbid psychiatric pathology in their children and their major reason for seeking medical attention were tics. Impairment noticed in children with tics were largely due associated comorbid disorders than the tics themselves. The most common age of onset of tics was between 7-10 years. Tics were more common in males with a male to female ratio of 3.6:1. Motor tics were the most common type of tics. Nearly all children with vocal tics had motor tics also except four of them who had only vocal tics. Premonitory urge before tic onset was present only in 8.3% (5) children.[13] The common exacerbating factors were playing TV/video games, doing homework, playing sports and negative emotions. Majority of children did not have a relieving factor (90%). Engaging in sport activities was the one reported in those with relieving factor. Many children had problems in school functioning, the commonest being poor progress in school and difficulties in scholastic skills development.[14]

Comorbid psychiatric disorders were present in 38 (63.3%) of children. They were Attention deficit hyperactivity disorder (48.3%), Obsessive compulsive disorder (6.6%), Autistic spectrum disorder (6.6%), Specific learning disorder (20%), Behavioural problems (16.6%), rage attacks (8.3%), sleep disturbances (8.3%), others (bruxism, seizure disorder) (6.6%).[15-17] There was a significant correlation between age of onset of tics and presence of premonitory urge and ability to suppress tics. Higher the age of onset of tics greater was the ability to experience premonitory urge and greater was the ability to suppress tics voluntarily. There was a significant correlation between tic severity and presence of comorbid disorders in particular, ADHD and behavioural problems. Children with severe tics had more frequency of co-occurring ADHD and behavioural problems. There was a significant correlation between presence of educational problems and comorbidity as well as tic severity. Children with comorbid disorders associated with tics had more educational problems and severe tics. There was a significant correlation between tic severity and presence of comorbidity and problems in family functioning. Children with problems in family functioning had more severe tics and more comorbid psychiatric disorders. There was a significant correlation between comorbidity and sex. Co-occurring psychiatric disorders were more common in male children. ADHD was more common in male children. There was significant correlation between ADHD and SLD and behavioural problems. Children with tics with ADHD also had higher incidence of SLD and behavioural problems. Linear relationship between tic severity score and comorbidity score was noted.

Studies on tic disorders in children are lacking in India. This study is one its first kind to study the clinical characteristics and comorbidities in Indian children with tic disorders. The questionnaires utilised in the study to identify the comorbid disorders are simple and can be used by the paediatricians in routine practice without much difficulty. The study emphasizes the fact that detection of associated comorbidities in children with tic disorders is necessary as it will facilitate early treatment as well as leads to improved outcome and reduced impairment in these children. The study has a few limitations. This study

was conducted in children who were diagnosed with tic disorders and were in follow up in child psychiatry department of a tertiary care hospital. A community-based study could not be conducted. ADHD subtype was not studied, only the presence or absence of ADHD was analysed.

CONCLUSION

It is highly recommended from the study that presence of tic symptoms in a child signals the need for a comprehensive assessment of other comorbid problems like ADHD and behavioural problems. Children with tic disorders have higher rates of complex association with comorbidities like ADHD, which cause more impairment than tics themselves. Additional ADHD comorbidity should be taken into account while considering the diagnosis and management of paediatric tic disorders.

ACKNOWLEDGEMENTS

Authors would like to thank study participants who kindly devoted their time to the study. Authors thank the Department of child psychiatry, the Professor Dr. Shanthi Nambi, Assistant Professor Dr. Vimal Joshi and clinical psychologist for helping us in the diagnosis of associated comorbid conditions.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Revathi N, Jayakumar M, Ajidhabharathi SD, Abdul Rahim A. Clinical correlates, characteristics and comorbidities of paediatric tic disorders. Int J Contemp Pediatr 2023;10:1211-5.