A cross-sectional exploratory study on the clinico-demographic profile, co-morbidities and treatment of children with tic disorder.

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Abstract

Introduction

Tic disorders encompass a spectrum of involuntary, repetitive movements or sounds, varying in complexity and severity, affecting individuals across different age groups. Tourette's disorder specifically presents as a neurological condition characterized by multiple motor and vocal tics lasting for more than a year, often accompanied by other behavioral or mental health conditions.

Methods

The study examines tic disorders in a group of 10 children under 14 at the child and adolescent mental health unit of Kanti Children's Hospital. It utilized the Yale Global Tic Severity Scale- Revised (YGTSS-R) to comprehensively analyse this neuro-developmental disorder, exploring various tic manifestations, complexities, and their impact. Further Rutter's multi-axial diagnoses was used for multidimensional assessment in understanding tic disorders comprehensively.

Results

The children in our study had both simple and complex motor tics, with a contrast between the types of motor and vocal tic symptoms. Using multi-axial diagnosis specific co-morbidities were also identified in our study cohort. Correlations between socio-demographic factors and clinical profiles were inconclusive in this limited sample.

Conclusion

The detailed assessment provided insights into tic characteristics, advocating for tailored treatment modalities like pharmacological interventions, psycho-education, habit reversal therapy, and cognitive behavioral interventions. The study emphasizes the necessity for comprehensive assessments and individualized interventions to address the varied manifestations and impacts of tic disorders in affected children.

Key words:
Children, Tic Disorder, Tourette's Disorder, Yale Global Tic Severity Scale

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INTRODUCTION

Tics, whether motor or vocal, encompass a wide spectrum of sudden, rapid, and repetitive movements or sounds.[1] Simple motor tics involve brief and seemingly purposeless actions, often affecting a single muscle group or body part like the face, neck, or shoulders. Complex motor tics, on the other hand, involve coordinated movements of multiple muscle groups, sometimes resembling purposeful actions. Simple vocal tics, also known as phonic tics, involve meaningless sounds produced through the nose, mouth, or throat. These might include coughing, grunting, or throat clearing. Complex vocal tics, while less common, encompass more intricate vocalizations, such as repeating words (echolalia) or uttering socially inappropriate expressions (coprolalia). The DSM-5 categorizes tic disorders into five distinct types.[1] Prevalence rates of Tourette syndrome (TS)

is 0.3% to 0.9% while for chronic motor tic disorder (CMTD) is 0.5% to 1.65% in children.[2-5]

Tic disorders, including Tourette Syndrome (TS), predominantly begin in early childhood, typically between the ages of 5 and 7 years, with males being more frequently affected than females at a ratio of approximately 4:1. Socioeconomic status and family history can influence the prevalence and severity of tic disorders. For instance, children from lower socioeconomic backgrounds often exhibit more severe symptoms, potentially due to limited access to healthcare and heightened environmental stressors. A study conducted in Nepal corroborates these findings, highlighting similar demographic trends and the impact of socioeconomic factors on the severity and management of the disorder. 6 Additionally, tic disorders often coexist with other psychiatric conditions such as ADHD and OCD, with nearly 60% of children with tic disorders also having ADHD and approximately 30% having OCD. Anxiety and depression are also prevalent, further complicating the clinical picture and necessitating comprehensive, multidisciplinary approaches to treatment.

The management of tic disorders typically involves a combination of pharmacological and behavioral therapies. Common medications include antipsychotics, alpha-2 agonists, and selective serotonin reuptake inhibitors (SSRIs), which help reduce tic severity and manage co-morbid symptoms. Behavioral interventions, such as Cognitive Behavioral Therapy (CBT) and Habit Reversal Training (HRT), have shown efficacy in reducing tic frequency and improving coping strategies. A study demonstrated that combining medication with behavioral therapy is often more effective than either approach alone.[7]

Despite these treatment options, there remains a need for individualized care plans due to the heterogeneity of tic disorders and their associated co-morbidities, with ongoing research exploring new therapeutic avenues, including neurostimulation techniques and novel pharmacological agents. The rationale for this study is to investigate the clinic-demographic profile, co-morbidities, and treatment of children with tic disorders in Nepal, given the scarcity of local data. Understanding these factors is essential for improving diagnosis, treatment, and management of tic disorders in Nepali children.

METHODS

This cross-sectional study focused on children aged 14 or younger who presented to the Child and Adolescent Mental Health Unit of Kanti Children Hospital between June 2nd, 2023, and December 2nd, 2023, with a diagnosis or suspicion of tic disorder. Qualified child and adolescent psychiatrists and psychiatrists diagnosed children within this age group based on the DSM-5 classification system. Informed and understood consent were taken from family members after duly explaining the procedure of study before enrolling children for the study. Prior ethical approval (Ref. no. 3075) was obtained from the Ethical Review Committee before commencing the study. The study was conducted exclusively within the country's sole child and adolescent mental health unit.

This study aims to describe the clinico-demographic profile of children with tic disorders by identifying clinical characteristics and demographic factors such as age, gender, socioeconomic status, and family history. It also seeks to explore and document the presence of co-morbid conditions like ADHD, OCD, anxiety, and depression. Additionally, the study will evaluate various treatment methods, including medications and behavioral therapies, to assess their effectiveness.

This specialized unit caters to outpatient mental health treatment for children within the specified age range, drawing patients from across the country. Each child underwent a comprehensive clinical evaluation following a predetermined format derived from interviews with both the child and their parents. The evaluation encompassed socio-demographic details, presenting complaints, a chronological history of the presenting illness, developmental background, temperament assessment, family history, treatment specifics, and a mental status examination.

In addition to clinico-demographic information and a comprehensive treatment history encompassing pharmacological and non-pharmacological approaches, each child underwent assessment using the revised Yale Global Tics Severity Scale (r-YGTSS). The study enrolled a total of 10 children diagnosed with tic disorder according to the DSM-5 criteria. Data collected were analysed using the Statistical Package for the Social Sciences (SPSS) version 27.0 for macOS.

RESULTS

During the 6 months study duration, we enrolled 10 children under 14 years of age with diagnosis tic disorder or Tourette's Disorder. The diagnosis was further confirmed by child and adolescent psychiatrist using DSM-5 criteria.

Table 1: Socio-demographic profile (N=10)

Characteristics		Frequency (N)
Age (in years) (Mean (SD))		10.6 (2.44)
Gender (male)		10
Level of Education	Primary School	3
	Middle School	7
Monthly Income of Family	NPR 20,000-50,000	6
	>NPR 50,000	4
Family Type	Nuclear	8
	Joint	2
Domicile (Province)	Madesh Pradesh	1
	Bagmati	8
	Gandaki	1
Locality	Urban	8
	Rural	2

The table 1 provides a comprehensive snapshot of various socio-demographic factors among the children diagnosed or suspected to have tic disorders, offering insight into their age distribution, gender, education levels, family income, family structure, geographic distribution, and urban-rural residence.

Table 2: Clinical Profile (N=10)

Characteristics			Frequency (N)	Remarks (wherever applicable)
Phenomenology		Motor	5	
		Vocal	1	
		Both	4	
Diagnosis (As per Rutter's Multi-axial diagnosis)	Axis 1	Provisional Tic Disorder	6	3 children with Tic disorder had ADHD as co-morbidity and 1 had additional co-morbidity of octurnal Enuresis
		Tourette's Disorder	4	
	Axis 2	Specific Learning Disability	1	
		Social (pragmatic) Communication Disorder	1	
	Axis 3	Average Intellectual Functioning	9	
		Mild Intellectual Developmental Disorder	1	
	Axis 4	Atopic Dermatitis	1	
	Axis 5	Fair Knowledge, attitude and practices	4	
		Poor Knowledge, attitude and practices	6	
Diagnosis (As per Rutter's Multi-axial diagnosis)			11.8 (9.43)	
Medications for Tics		None	7	2 children having ADHD as co-morbidity were also taking Cap. Atomoxetine
		Tab. Risperidone	3	
Duration of Medication Use (in months) (Mean (SD))			5.33 (4.73)	3 children were receiving risperidone
Duration of Structured Therapy (in months) (Mean (SD))			4 (1.63)	3 children were receiving therapy
Nature of Therapy		Psychoeducation	10	3 children were receiving structured therapy
		Relaxation Exercises	6	
		Cognitive Behavioral Therapy	1	
		Habit Reversal Therapy	2	

Table 2 outlines the clinical profile of 10 children with diagnosed tic disorders or Tourette's Disorder. It showcases diverse tic phenomenology: 50% motor, 10% vocal, and 40% both. Rutter's Multi-axial diagnosis system indicates 60% with tic disorders, 40% with Tourette Syndrome, some with co-morbidities like ADHD and intellectual developmental disorder. The majority had average intellectual functioning (90%). Treatment varied, with 70% receiving no tic-specific medication, while psychoeducation was the predominant therapy, supplemented by other approaches.

Table 3: Description of Yale Global Tic Severity Scale-Revised (YGTSS-R) (N=10)

Description	Items		Frequency (N)	Remarks (wherever applicable)
Motor Tics Present?			9	
Motor Tic Symptom Checklist	Simple Motor Tics (Rapid, Darting, "Meaningless")	Head jerks	4	
		Eye blinking	3	
		Shoulder shrugs	1	
		Oro-facial movements	1	
	Complex Motor Tics (Slower, "Purposeful")	Head gestures	1	Of the 9 children having motor tics, 5 also had complex motor movements
		Eye movements	2	
		Facial movements	2	
Duration of motor tics (Mean (SD))			24.4 seconds (16.99)	
Any disinhibited behaviors?			0	
Phonic tics present?			5	
Phonic Tic Symptom Checklist	Simple Phonic Symptoms (Fast, "Meaningless" Sounds)	Throat clearing	2	
		Gulping	2	
		Coughing	1	
	Chronic Phonic Symptoms (Language: Words, Phrases, Statements)			No children with vocal tics had complex phonic symptoms
Duration of phonic tics (Mean (SD))			16.67 seconds (5.16)	
Number of Tics	Motor		5	1 child had single tic while 4 had multiple (2-5) discrete tics
	Phonic		1	
	Both		4	
Frequency of Tics	Motor		5	1 child had long tic free interval. 2 child had tic free interval of three hours while the remaining 2 had virtually every hour.
	Phonic		1	
	Both		4	
Intensity of Tics	Motor		5	2 children had tics that were less visible, 2 had slight forceful tics, while 1 had more forceful tic.
	Phonic		1	
	Both		4	
Complexity of Tics	Motor		5	All 5 children had tics that were clearly nit "simple" in character
	Phonic		1	
	Both		4	
Interference from Tics	Motor		5	4 children had minimal interference and 1 had mild interference
	Phonic		1	Minimal interference
	Both		4	1 had mild and 3 had moderate interference

Table 3 delineates the Yale Global Tic Severity Scale-Revised (YGTSS-R) characteristics across 10 children diagnosed tic disorders or Tourette's disorder, providing a detailed breakdown of motor and phonic tic presentations, durations, frequencies, intensities, complexities, and interference levels.

Regarding motor tics, nine children exhibited these symptoms, featuring a variety of simple motor tics such as head jerks, eye blinking, shoulder shrugs, and oro-facial movements, with varying frequencies and intensities. Additionally, five of the nine children displayed complex motor movements, involving head gestures, eye movements, and facial movements, illustrating a blend of tic complexities among this subset.

In terms of phonic tics, five children presented these symptoms, showcasing both simple phonic symptoms like throat clearing, gulping, and coughing, as well as chronic phonic symptoms characterized by language use. Interestingly, none of the children with vocal tics exhibited complex phonic symptoms, highlighting distinctions within this domain.

The average duration of motor tics was 24.4 seconds, while phonic tics lasted approximately 16.67 seconds, providing insights into the temporal aspects of these tics among the participants.

The number, frequency, intensity, complexity, and interference levels of tics varied among the children, with some displaying single or multiple discrete tics and different degrees of interference in daily activities due to tic manifestations. These observations underscore the heterogeneous nature of tic presentations, emphasizing the diverse clinical profiles and impact levels among the studied cohort.

DISCUSSION

Tic disorders, encompasses a spectrum of motor and vocal symptoms, pose complex challenges in diagnosis and management, often affecting paediatric populations. It starts invariably in paediatric age group.10 The present study aimed to assess the clinical and socio-demographic profiles of 10 children under 14 years with diagnosed or suspected tic disorders, utilizing the DSM-5 criteria for diagnosis and employing the Yale Global Tic Severity Scale-Revised (YGTSS-R) to detail tic presentations. This discussion interprets the multifaceted findings, linking them to existing literature on tic disorders in paediatric psychiatry.
Clinical Diversity in Tic Presentations

The Yale Global Tic Severity Scale- Revised (YGTSS-R) analysis conducted in this study revealed a spectrum of tic manifestations among the examined paediatric population.[4] This aligns with earlier research, emphasizing the heterogeneous and multifaceted nature inherent in tic disorders. These studies underscored the diversity observed in motor and vocal tic presentations, showcasing variations not only in tic types but also in their complexities and associated behaviors.[9-10]

Specifically, the findings highlighted the prevalence of both simple and complex motor tics among the children under study. Simple motor tics, such as head jerks, eye blinking, shoulder shrugs, and oro-facial movements, were notably identified. Moreover, a subset of the children displayed complex motor movements, including head gestures, eye movements, and facial movements. This intricate variation in motor tic presentations underscores the complex symptomatology inherent in tic disorders.[2]

Furthermore, the absence of complex phonic symptoms within vocal tics among the studied children provides additional insight into the distinct nature of phonic tic manifestations. This absence suggests a potential differentiation in the character and complexity between motor and vocal tic presentations within this specific cohort, further emphasizing the intricate nature of tic disorders.[3]

Multi-Axial Diagnoses and Co-morbidities

The application of multi-axial diagnoses, notably Rutter's system, within this study offered a comprehensive and holistic understanding of tic disorders among the pediatric population. This approach facilitated the delineation and elucidation of various co-morbidities, prominently identifying conditions such as Attention Deficit Hyperactivity Disorder (ADHD) and nocturnal enuresis. These findings resonate with earlier research by Martino and Hedderly, reinforcing the significance of employing a multidimensional assessment framework in understanding tic disorders.[11]

Emphasizing the necessity of such a multidimensional assessment in tic disorders, these findings underscore the importance of considering associated conditions that extend beyond the primary symptoms. By illuminating co-morbidities like ADHD and nocturnal enuresis, this multi-axial diagnostic approach contributes to a more comprehensive understanding of the complexities and challenges faced by children affected by tic disorders.[5]

Socio-Demographic Correlations

While no clear correlations emerged in this small sample, studies have indicated potential associations between socio-economic status, geographical location, and tic severity.[8] Further exploration with larger cohorts could elucidate

these potential correlations like age range, abnormal birth history, parenting patterns, family history.[6]

YGTSS-R Insights and Treatment Implications

The detailed YGTSS-R metrics, elucidating tic durations, frequencies, intensities, and interference levels, highlights the need for tailored interventions, combining medication and diverse therapeutic modalities, including psychoeducation and habit reversal therapy, aligning with established treatment guidelines.[7]

Of significant importance is the evaluation of interference levels caused by tics in various domains of life. The YGTSS-R delineates the extent to which tics disrupt daily functioning, providing insights into the impairments experienced by individuals.[2,12] This comprehensive understanding of interference aids in tailoring interventions to mitigate the adverse effects of tics on academic, social, and personal spheres.

Limitations, including the small sample size and short duration of the study, warrant caution in generalizing findings. Future research should encompass larger cohorts, longitudinal studies, and incorporate neurobiological markers to deepen understanding and improve diagnostic and therapeutic approaches in paediatric tic disorders.

CONCLUSION

This study discusses the intricate and varied nature of tic disorders among children under 14, elucidating a diverse spectrum of tic manifestations through the meticulous assessment provided by the Yale Global Tic Severity Scale-Revised (YGTSS-R). The findings emphasize the need for a comprehensive understanding of tic disorders, acknowledging the complexities in motor and vocal tic types, durations, frequencies, intensities, and their impacts on daily functioning. Furthermore, the exploration of co-morbidities using Rutter's multi-axial diagnoses underscores the importance of considering associated conditions beyond the primary symptoms, highlighting the multidimensional nature of these disorders. While correlations between socio-demographic factors and tic profiles in this limited sample remained inconclusive, the study paves the way for further investigations with larger cohorts to unveil potential associations between socio-economic status, geographical location, and tic severity.

The detailed assessment provided insights crucial for personalized treatment modalities, combining pharmacological interventions and diverse therapeutic approaches like psychoeducation, habit reversal therapy, and cognitive behavioral interventions. These interventions, in line with established treatment guidelines, cater to the individualized needs of those affected by tic disorders, emphasizing the importance of a multifaceted approach in managing and addressing the complex manifestations and impacts of these conditions on the lives of affected individuals. Overall, this study highlights the necessity for holistic assessments and personalized interventions to better comprehend and alleviate the diverse challenges posed by tic disorders in pediatric populations.

ACKNOWLEDGEMENT

We would like to acknowledge all the children and their parents who agreed to participate in this study, the members of institute ethics committee and staffs of Kanti Children Hospital for their support. Lastly, the authors also acknowledges the support of all the staffs and clinicians of Child and Adolescent Mental Health Unit of Kanti Children Hospital.

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