



Tics and TikTok: Functional Tics Spread Through Social Media

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ABSTRACT: Background: Functional movement disorder is a subtype of functional neurologic symptom disorder a syndrome of involuntary physical, neurologic-type symptoms that are incongruous with “organic” disease. Throughout history, there have been outbreaks of functional symptoms in communities; until recently, spread had been confined to groups of people who shared a physical location. However, in the era of social media, a new mode of dissemination may have arisen.

Cases: We describe six teenage girls, each with the explosive onset of tic-like movements. Mean age of onset was 14.2 years. The presence of features incongruous with Tourette syndrome on history and examination prompted the diagnosis of functional tics. All patients reported exposure to a specific social media personality before symptom onset.

Conclusions: Our series suggests that social media may contribute to the spread of functional neurologic symptom disorder, in a way previously requiring physical proximity.

Functional neurologic symptom disorder (FNSD) is a syndrome of involuntary physical, neurologic-type symptoms that are psychological in origin and incongruous with “organic” disease, and includes functional movement disorder (FMD).¹ Suggestive features include acute or explosive onset, rapid progression, episodic course with symptom-free intervals, entrainment, variability, distractibility, suggestibility, and others.^{2,3} Of note, the authors acknowledge the flimsy use of the term “organic” here and in other current literature, employed to mean “not FNSD,” and utilize it as a placeholder until a suitable term is found.

Throughout history, outbreaks of such phenomena affecting groups of people have occurred.^{4–7} Historically, these were known as “mass hysteria,” more recently as “mass psychogenic illness,” and in the parlance of our times might be called mass functional illness. In these outbreaks, social connection existed between two or more of the affected individuals, and symptoms spread through sight, sound, or verbal communication.^{4,7}

Until recently, spread of functional symptoms was confined to people sharing a physical location. However, since the advent of social media (used by 90% of college students according to one study),⁸ access to videos of various symptoms and behaviors, both functional and “organic,” is readily available. In the context of

describing a rise of new cases of FMD during the COVID-19 pandemic, the initial observation of abrupt development of tic-like movements and sounds while watching similar phenomenology on social media was described and given the alliterative term “TikTok tics.”⁹ Here, we describe six teenage girls who developed functional tics after exposure to a single social media personality.

Case Series

Within 3 months (November 2020–January 2021), we evaluated six teenage girls presenting with abrupt-onset tic-like movements. We reviewed medical records of the patients. All patients provided verbal consent, and caregivers provided written consent approved by the institutional review board, before obtaining video to allow for written and electronic publication.

Mean age of onset was 14.2 years (range 13–16 years). No patient had family history or childhood history of tics. Five recalled the exact date on which the movements began. No patients were able to suppress movements (1 was unable to suppress them at onset and then became suppressible after initiation of pharmacotherapy) and two described a premonitory urge. All developed

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TABLE 1 Description of clinical features of functional tics within this series

Case	Age of onset	Sex	Phenomenology of tics	Vocalizations	Suppressibility	Presence of premonitory urge	Presence of “tic attacks”	Unusual triggers	Other concurrent somatic manifestations	Pharmacological treatment and outcome*
1	16 yr	F	Dystonic (face); clonic (face, extremities); stereotypic (hands); complex motor with concomitant vocalization	Palilalia, short phrases, vowel sounds, sniffing, single words	No	No	Yes	Talking to other people	Dissociative symptoms of feeling like body parts were not her own, dyspnea, stuttering; transient confusion	Guanfacine 0.5 mg at bedtime; all symptoms resolved after 4 doses, discontinued without recurrence of symptoms
2	14 yr	F	Dystonic (face, neck); clonic (extremities); stereotypic (hands); complex motor with concomitant vocalization	Whistling, coprolalia, short phrases, clicking, purring	No	No	Yes	Flashing lights, hearing whistling	Functional tremor	N/A
3	13 yr	F	Dystonic (face); clonic (face, neck, extremities); stereotypic (hands); complex motor with concomitant vocalization	Short phrases, clicking, single words, squeaking	Yes**	Yes	Yes	Flashing lights, loud noises, the word “sound”, dampness of her hair, 7 PM every night	None	Fluphenazine 0.5 mg every morning and 1 mg at bedtime, led to daytime somnolence, felt as though movements were easier to suppress. Diazepam 2 mg as needed, allowed for movements to be suppressed, discontinued
4	14 yr	F	Dystonic (neck); clonic (extremities); stereotypic (hands)	Single words, blowing raspberries, squeaking	No	Yes	Yes	Presence of other people	Functional stereotypy, functional tremor	Pimozide 2 mg daily; no improvement, led to daytime somnolence, discontinued
5	14 yr	F	Dystonic (extremities) Clonic (face, extremities) Stereotypic (hands)	Short phrases, coprolalia, whistling	No	No	Yes	None	Functional tremor	N/A
6	14 yr	F	Dystonic (face, neck, extremities); clonic (face, neck, extremities); stereotypic (hands); complex motor with concomitant vocalization	Grunting, vowel sounds, clicking, short phrases, whistling	No	No	Yes	Loud noises, loud footsteps, hearing whistling sounds, extremes of temperature	None	Clonidine 0.1 mg twice daily; no improvement led to daytime somnolence, discontinued

Abbreviations: F, Female.

*Pharmacological treatments were administered by providers before our evaluation.

**Movements and sounds were suppressible following initiation of pharmacologic treatment.



Video 1. Patient 2 displaying functional tics triggered by examiner whistling as well as functional tremor and functional stereotypy. Video content can be viewed at <https://onlinelibrary.wiley.com/doi/10.1002/mdc3.13267>



Video 2. Patient 3 displaying functional tics triggered by application of a tuning fork and flashing lights. Video content can be viewed at <https://onlinelibrary.wiley.com/doi/10.1002/mdc3.13267>

functional phonic tics (Table 1). All described discrete “tic attacks,” episodes of insuppressible involuntary movements and vocalizations of increased frequency and severity, with a clear beginning and end. Five described specific-unusual triggers for these spells, including loud noises, extreme temperatures, flashing lights, or hearing whistling or particular words. Four had other somatic manifestations, and three had concurrent FMD (two with functional tremor and one with both functional stereotypy and functional tremor).

Pre-existing psychiatric diagnoses were common in this cohort; three had a prior diagnosis of depression, two had a prior diagnosis of anxiety, and one had a diagnosis of post-traumatic stress disorder (PTSD). Four of the girls experienced significant trauma over the preceding years (e.g., witnessing violence within the family), and one reported finding her mother unresponsive from a drug overdose.

Each patient reported watching videos of tics on the social media platform, TikTok, before symptom onset, and each

identified one specific female British TikTok personality they had frequently watched.

Case 1

A 16-year-old girl presented with sudden-onset involuntary movements. One day she experienced a panic attack and dissociative symptoms (perceived certain body parts were not her own), followed by involuntary tapping and stuttering. Within minutes, she developed numerous brief, repetitive movements and sounds including dystonic eye blinks, shoulder shrugging, sniffing, blowing kisses, and others (Table 1). While alone, movements and sounds would not occur but happened in short flurries in the presence of others. Outside providers prescribed guanfacine 0.5 mg at bedtime and within 30 minutes of the first

TABLE 2 Descriptions and frequency of common tics within cohort that are also seen in the social media influencer's videos

Phenomenology	Frequency (out of 6)
Neck flexion, extension, and/or anterior sagittal shift, with elevation of shoulders or abduction of arms, and concurrent “who” vocalization	4
Punching/slapping of the face/neck/head	4
Punching of the contralateral palm	3
Clapping	3
Clicking	3
Whistling	3
Abduction of the arms with rapid finger oscillations or pronation/supination of the hands (“jazz hands”)	3
Extension of the thumb and fifth finger while 2nd–4th digits flexed and pronation/supination of the forearm (“hang-loose sign”)	2
Throwing objects	2
Blowing kisses	2

dose, her stuttering resolved. After four doses, all symptoms abated without recurrence.

Case 2

A 14-year-old girl with depression and anxiety presented with abrupt onset of involuntary movements that began 1 day, first with quick, repetitive punching, followed by numerous other movements (Table 1) and sounds (coprolalia, short repetitive phrases). These often occurred in flurries and triggered by flashing lights or hearing whistling (Video 1). She developed leg tremor, which spread to the hands when weight-bearing (Video 1).

Case 3

A 13-year-old girl with anxiety presented with abrupt onset of involuntary movements 1 day, first with touching of her neck followed by a flurry of other movements (Table 1; Video 2) and short phrases such as “knock on wood” or “the birds work bourgeoisie”, which were continuous for 6 hours. She described preceding “warm glow”, which resolved following the movements. She had flurries of movements and sounds whenever she heard the word “sound”, heard loud sounds, or saw flashing lights

(Video 2); these also occurred at 7:00 PM nightly. She was unable to suppress the movements and sounds until she was treated with diazepam and fluphenazine, which allowed her to completely suppress them for 6 to 8 hours while in school.

Discussion

Functional tics are often phenomenologically indistinguishable from tics seen in Tourette syndrome, which can make them difficult to differentiate clinically, and share similar features such as suggestibility, distractibility, and worsening during periods of stress. Clues on history and examination are often helpful in differentiating between these conditions. These may include common interference with voluntary actions, lack of premonitory urge, inability to suppress the movements, atypical response to anti-tic medication (such as lack of response or abrupt resolution with first dose), absence of a waxing/waning course, older onset, and the presence of other neurologic symptoms (eg, convulsions, stuttering, gait impairment) or other co-occurring FMD.^{10–13} Tics mainly affecting the trunk or extremities, with a relative absence of cranial tics, has been noted,¹⁰ in keeping with our observations and inverse to the typical rostro-caudal gradient. It is important to note that in FNSD, the existence of a pattern of positive symptoms and signs on history and examination, rather than the absence of another etiology, is crucial in making the diagnosis.

“Tic attacks” are discrete episodes of tics and/or functional tic-like movements, lasting from minutes to several hours with abrupt onset and offset. Tics during these events may appear more severe, sometimes described as “seizure-like” by caregivers and can prompt emergency room visits. It has been suggested that tic attacks are triggered and maintained by psychological factors and distinct from the waxing and waning nature of tics in Tourette syndrome.¹⁴

Within our cohort, acute presentation without history of similar movements earlier in life, presence of “tic attacks”, other associated FMD and somatic manifestations, unusual-specific triggers, lack of premonitory urge, and inability to suppress movements were supportive of the diagnosis of functional tics.

All patients in our series identified the same social media influencer as whom they watched before onset of symptoms. She has both TikTok and YouTube channels with millions of views and followers. Her online videos were reviewed by the authors and links can be provided on request. Specific movements and sounds were demonstrated by the influencer and appeared frequently in our cohort (Table 2).

The adoption of certain symptoms, behaviors, or motor patterns following the observation of other individuals displaying similar manifestations is called modeling.¹⁵ Evidence suggests that exposure to patterns of movements may serve as a model for others to unconsciously and involuntarily produce similar movements, and individuals with FMD are more likely to have friends or family members with phenotypically similar movements compared to those with “organic” movement disorders.^{15,16} In

contrast to other types of movement disorder phenomenology, such as tremor, one of the unique aspects of tics is that this type of movement can be modeled more reliably, perhaps contributing to the similarity in phenomenology between functional tics and those seen in Tourette syndrome.

The pathophysiologic basis for the development of FNSD remains poorly understood. Leading theories suggest deficiencies within several areas in cognitive models such as deficiencies in agency, emotional dysregulation, bodily awareness, and others.¹⁷ Resting-state functional magnetic resonance imaging in patients with non-epileptic events demonstrated strong functional connectivity between the insula, inferior frontal gyrus, parietal cortex, and precentral sulcus, areas involved in agency, emotion, and movement.³ Furthermore, decreased activity within the right temporoparietal junction has also been found in patients with FNSD, which is thought to contribute to the patient's perception of the movements being involuntary.¹⁷ It is not clear whether these findings represent an etiology of the functional movements or secondary changes that are seen in association with the clinical symptoms.

Because functional tics and tics seen in Tourette syndrome can be quite difficult to differentiate, even for those with extensive training and experience, great care must be taken to ensure individuals with Tourette syndrome are not diagnosed with functional tics. Of note, functional tics can also occur in those with Tourette syndrome.¹⁰

Few firm conclusions can be made regarding the role of social media in the development of functional tics based on a single small cohort. Although we describe six such cases presenting during a three-month period, we suspect that these are not the only six. The consistency, with which patients presenting with functional tics cited exposure to the same TikTok personality, and similarities in their movements, suggests that the spread of functional symptoms via social media is possible. We advise that healthcare providers be aware and inquire about these exposures when evaluating patients with functional tics.

Author Roles

(1) Research project: A. Conception, B. Organization, C. Execution; (2) Manuscript Preparation: A. Writing of the First Draft, B. Review and Critique.

M.H.: 1A, 1B, 1C, 2A

M.P.: 1A, 1B, 1C, 2B

Disclosures

Ethical Compliance Statement: No International Review Board was required for preparation of this case series, ethical guidelines were followed to assure patient privacy was maintained. Written consent from patient guardians was obtained before obtaining video for purposes of education within a medical peer reviewed journal. We confirm that we have read the

Journal's position on issues involved in ethical publication and affirm that this work is consistent with those guidelines.

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