Adult onset tic disorders

Sylvain Chouinard, Blair Ford

Abstract

Background—Tic disorders presenting during adulthood have infrequently been described in the medical literature. Most reports depict adult onset secondary tic disorders caused by trauma, encephalitis, and other acquired conditions. Only rare reports describe idiopathic adult onset tic disorders, and most of these cases represent recurrent childhood tic disorders.

Objective—To describe a large series of patients with tic disorders presenting during adulthood, to compare clinical characteristics between groups of patients, and to call attention to this potentially disabling and underrecognised neurological disorder.

Methods—Using a computerised database, all patients with tic disorders who presented between 1988 and 1998 to the movement disorders clinic at Columbia-Presbyterian Medical Center after the age of 21 were identified. Patients’ charts were retrospectively reviewed for demographic information, age of onset of tics, tic phenomenology, distribution, the presence of premonitory sensory symptoms and tic suppressibility, family history, and associated psychiatric features. These patients’ videotapes were reviewed for diagnostic confirmation and information was obtained about disability, course, and response to treatment in a structured follow-up interview.

Results—Of 411 patients with tic disorders in the database, 22 patients presented for the first time with tic disorders after the age of 21. In nine patients, detailed questioning disclosed a history of previous childhood transient tic disorder, but in 13 patients, the adult onset tic disorder was new. Among the new onset cases, six patients developed tics in relation to an external trigger, and could be considered to have secondary tic disorders. The remaining patients had idiopathic tic disorders. Comparing adult patients with recurrent childhood tics and those with new onset adult tics, the appearance of the tic disorder, the course and prognosis, the family history of tic disorder, and the prevalence of obsessive-compulsive disorder were found to be similar. Adults with new onset tics were more likely to have a symptomatic or secondary tic disorder, which in this series was caused by infection, trauma, cocaine use, and neuroleptic exposure.

Conclusions—Adult onset tic disorders represent an underrecognised condition that is more common than generally appreciated or reported. The clinical characteristics of adults newly presenting to a movement disorder clinic with tic disorders are reviewed, analysed, and discussed in detail. Clinical evidence supports the concept that tic disorders in adults are part of a range that includes childhood onset tic disorders and Tourette’s syndrome.

Keywords: Tourette’s syndrome; secondary tic disorders; obsessive-compulsive disorder; attention-deficit hyperactivity disorder

Tic disorders are commonly considered to be childhood syndromes. Childhood onset is a defining feature of Tourette’s syndrome, a chronic disorder of severe motor and vocal tics that begins before the age of 18 or 21, depending on the criteria. The childhood onset of tic disorders has been consistently described since Gilles de la Tourette’s seminal report, in which all eight patients presented with tics during childhood. The DSM-IV classification of tic disorders does not include a category for tic disorders that develop during adulthood, other than tic disorder “not otherwise specified”. Tic disorders experienced during adulthood are largely considered to be persistent tics from childhood. In adults presenting with a tic disorder, it is often assumed that the patients cannot remember having experienced childhood tics. As such, tic disorders newly presenting during adulthood have only occasionally been described in isolated case reports, and mostly in the context of symptomatic, or secondary, tic disorders. The goal of the present study was to describe a large series of patients with tic disorders presenting during adulthood, to compare clinical characteristics between groups of patients, and to call attention to this potentially disabling and underrecognised neurological disorder.

Methods

From a computerised database of patients, we extracted the records of all patients who presented between 1988 and 1998 to the Center for Movement Disorders, Columbia Presbyterian Medical Center, for evaluation or treatment of a tic disorder that had developed after the age of 21. All patients were initially diagnosed by a movement disorder specialist, based on the clinical appearance of tics as sudden, brief, purposeless, stereotyped movements or sounds. We reviewed videotaped examinations of the patients for diagnostic confirmation. We considered a tic disorder to be present when the patient stated that the tics were socially, occupationally, or functionally disabling in any way. Only those patients in whom a tic disorder was the sole complaint and primary diagnosis were considered in this...
Adult onset tic disorders

study, but we included patients with symptomatic or secondary tics if their movement disorder consisted exclusively of tics. Patients with tics caused by somatoform illness and related conditions were not included. All patients who presented with tic disorders developing after the age of 21 were considered to have adult onset tics. We attempted to establish whether patients with adult onset tics had experienced tics during childhood. Patients with tic disorders that began during childhood and persisted through adulthood were not included. We did not exclude patients with adult onset tics if their tic disorder began after the age of 21 but who had experienced tics lasting less than 12 months during childhood, and who did not present to a physician at that time.

We retrospectively reviewed patients’ charts for demographic information, age of onset of tics, description of tics, distribution, the presence of premonitory sensory symptoms, the degree of tic suppressibility, family history, associated psychiatric features, disability, course, and response to treatment. Where possible, we obtained psychiatric records. The diagnosis of obsessive-compulsive disorder was based on DSM-IV criteria, requiring recurrent obsessions or compulsions severe enough to be time consuming or cause significant distress or impairment. To obtain more recent follow up information, a structured questionnaire was administered to 18 patients by phone or direct interview.

Results

Of 411 patients with tic disorders in our database, 22 (5.4%) presented for evaluation of tics after the age of 21. For 20 patients, videotaped examinations were available for confirmation of diagnosis. There were 17 men and five women. The mean age of onset was 40 years, ranging from 24 to 63 years. Nine patients had a history of tics during childhood, but in 13, there was no prior history of tics, as far as could be determined from interview with the patient and family members.

In 16 patients, the aetiology of the tic disorder was considered idiopathic, but in six, all with new onset tic disorder, there seemed to be a causal relation between the tic disorder and an environmental factor. In one patient with new adult onset tics, the disorder developed during an extended cocaine binge. In two patients, a new tic disorder developed after a head injury sustained during a car accident. A fourth patient described the onset of neck tics after straining her neck during weight lifting. A fifth had tardive tics due to neuroleptic exposure. A sixth patient developed a prominent throat clearing tic after a severe pharyngitis. Symptomatic or secondary tic disorders always presented as a new onset tic disorder in adults, and never as recurrent childhood tics, a relation that was statistically significant (p<0.05, Fisher’s exact test).

The clinical characteristics of our patients with new onset adult tics are listed in table 1. Among 13 patients with new onset adult tics, three patients had isolated motor tics, five patients had multiple motor tics, three patients had multiple motor and vocal tics, one patient had an isolated vocal tic, and one patient experienced multiple vocal tics. Tic suppressibility was noted in nine patients and eight patients had a premonitory sensory symptom before the tics. A family history of tic disorder was present in five patients and five had symptoms of obsessive-compulsive disorder. The duration of illness in patients with new adult onset tics was on average 10.5 years at the time of most recent follow up, ranging from 1.5 to 45 years. Nine patients elected to have treatment, and in four, there was modest improvement. Over the course of the illness, tics tended not to vary in repertoire, and isolated tics remained unchanged. Tic severity tended to wax and wane, and no patient experienced a prolonged symptom remission.

The clinical characteristics of patients with a recurrent childhood tic disorder during adulthood are listed in table 2. For the nine patients with recurrent childhood tics, the mean age of recurrence was 47 years, ranging from 25 to 63 years. All patients had experienced transient childhood tics of mild degree, and the mean symptom free hiatus in these patients was about 32 years, ranging from 12 to 56 years. Five patients exhibited multiple motor tics, three patients had multiple motor and phonic tics, and one had an isolated motor tic. No patients had verbal tics. All patients described a premonitory sensory symptom and were able to suppress the tics. The childhood tics consisted of facial tics or blinking in seven patients and in two patients, the appearance of the childhood tics was not specified. No patient had undergone evaluation or treatment during childhood. Four patients had symptoms of obsessive-compulsive disorder. A positive family history for tic disorder was present in four patients and two had a family history of obsessive-compulsive disorder. The mean duration of illness from the recurrence of tics to the most recent follow up was 13 years, ranging from 3 to 20 years. Seven patients underwent treatment for their tics, of whom three noted some improvement. No patient had a full or sustained remission during adulthood.

CASE REPORTS

New onset tics during adulthood

Case 2—This patient developed a tendency to grunt in his 30s. With time, the grunting became more frequent and intrusive, and was joined by several other stereotyped sounds and vocalisations, including frequent short verbal utterances: “yo” “hey, hey”, “me too”. The vocalisations began to interfere with the patient’s social life, preventing him from going to the cinema or social gatherings. He described a premonitory sensation but was powerless to control the vocalisations. Treatment with haloperidol, benztprine, clonidine, and clonazepam did not help, and he experienced akathisia on haloperidol. The tics were improved on verapamil. There was no history of previous tics or psychopathology, but the family history was positive for tic disorders. On examination, the patient exhibited his stere-
Table 1 Clinical characteristics of patients with new adult onset tics

<table>
<thead>
<tr>
<th>Patient</th>
<th>Sex</th>
<th>Age of onset</th>
<th>Description of tics</th>
<th>Distribution of tics</th>
<th>Family history of tic disorder</th>
<th>Associated psychiatric symptoms</th>
<th>Medication trials</th>
<th>Course</th>
<th>Follow up (y)</th>
<th>Additional features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>24</td>
<td>Multiple motor tics</td>
<td>Neck and arms, face, limbs</td>
<td>Y</td>
<td>No benefit from TRHX, CLNZ, TBZ, PMZ</td>
<td>VPM</td>
<td>Stable</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>30</td>
<td>Primary vocalization tics with multiple motor tics</td>
<td>Face, arms</td>
<td>Y</td>
<td>Improvement on VPM</td>
<td>Waxing and waning, improved by follow up</td>
<td>45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>32</td>
<td>Single motor tic</td>
<td>Neck</td>
<td>N</td>
<td>No benefit</td>
<td>Stable</td>
<td>18</td>
<td>Tic developed after straining neck while weight lifting</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>M</td>
<td>33</td>
<td>Multiple vocal and motor tics</td>
<td>Larynx, neck, arms</td>
<td>N</td>
<td>No benefit from CBZ, CLNZ</td>
<td>Stable</td>
<td>2</td>
<td>Tics developed after MVA with head trauma</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>40</td>
<td>Multiple motor tics</td>
<td>Face</td>
<td>N</td>
<td>No benefit from DZP, CLNZ, TBZ, PMZ</td>
<td>Waxing and waning</td>
<td>4</td>
<td>Improved, Tics developed after MVA</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>41</td>
<td>Multiple phonic and motor tics</td>
<td>Face, neck, arms</td>
<td>N</td>
<td>Botulinum toxin</td>
<td>Improved</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>M</td>
<td>42</td>
<td>Primary neck tic with multiple facial and arm tics</td>
<td>Face, neck</td>
<td>Y</td>
<td>OCD</td>
<td>Untreated</td>
<td>Improved</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>M</td>
<td>49</td>
<td>Multiple motor tics</td>
<td>Face, neck, arms</td>
<td>N</td>
<td>OCD</td>
<td>No benefit from CLNZ, HAL, PMZ</td>
<td>Waxing and waning</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>F</td>
<td>69</td>
<td>Single vocalisation</td>
<td>Vocal</td>
<td>N</td>
<td>OCD</td>
<td>Untreated</td>
<td>Stable</td>
<td>5</td>
<td>Tics developed during pharyngitis</td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td>46</td>
<td>Multiple complex motor tics</td>
<td>Face, neck, arms</td>
<td>Y</td>
<td>Substance misuse disorder Schizo affective</td>
<td>Unresponsive to levodopa, helped with CLNZ</td>
<td>Tics developed during period of heavy cocaine use</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>M</td>
<td>40</td>
<td>Single complex motor tic: blowing movements</td>
<td>Face, neck</td>
<td>N</td>
<td>OCD</td>
<td>No benefit from CLNZ, TBZ, PMZ</td>
<td>Stable</td>
<td>5</td>
<td>Tic status developed after 5 year exposure to molindone</td>
</tr>
<tr>
<td>12</td>
<td>M</td>
<td>46</td>
<td>Single respiratory tic</td>
<td>Larynx, neck</td>
<td>N</td>
<td>OCD</td>
<td>Improvement on DZP</td>
<td>Waxing and waning</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>M</td>
<td>25</td>
<td>Multiple verbal tics, including coprolalia</td>
<td>Vocal</td>
<td>Y</td>
<td>OCD</td>
<td>Untreated</td>
<td>Waxing and waning</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

CBZ=Carbamazepine; CLNZ=clonazepam; DZP=diazepam; HAL=haloperidol; MVA=motor vehicle accident; OCD=obsessive-compulsive disorder; PMZ=pimozide; TBZ=tetrabenazine; TRHX=trihexiphenidyl; VPM=verapamil.

Case 5—This 63 year old man was referred for evaluation of abnormal facial movements. Since the age of 40, he had been aware of involuntary blinking, head bobbing, and neck jerking movements. There was no history of abnormal vocalisation. He described that he was able to partially suppress the movements, which were preceded by an inner sensation. Treatment with haloperidol, pimozide, tetrabenazine, and diazepam gave no relief. There was no history of tics or obsessive-compulsive disorder, or family history of tic disorders or obsessive-compulsive disorder. A review of the videotape taken during the first examination showed numerous minor tics consisting of blinking, anterocollic jerks, shoulder jerks, and lower face grimacing. On a

Table 2 Clinical characteristics of patients with recurrent childhood tics

<table>
<thead>
<tr>
<th>Patient</th>
<th>Sex</th>
<th>Age of onset</th>
<th>Description of tics</th>
<th>Distribution of tics</th>
<th>Childhood tics</th>
<th>Family history</th>
<th>Associated psychiatric symptoms</th>
<th>Medication trials</th>
<th>Course</th>
<th>Follow up (y)</th>
<th>Duration of follow up (y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>M</td>
<td>25</td>
<td>Phonations and multiple motor tics</td>
<td>Larynx, face, neck, limbs, shoulders</td>
<td>Multiple motor tics</td>
<td>Tics OCD</td>
<td>No benefit from DZP, ALPZ, PMZ</td>
<td>Improvement on CLNZ, FLUOX, VPA</td>
<td>Waxing and waning, Improved</td>
<td>20</td>
<td>1.5</td>
</tr>
<tr>
<td>15</td>
<td>M</td>
<td>31</td>
<td>Multiple motor tics</td>
<td>Face, neck</td>
<td>Unspecified</td>
<td>Tics OCD</td>
<td>No benefit from CLNZ, TBZ, PMZ</td>
<td>Improvement on VPM</td>
<td>Waxing and waning, Improved</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>M</td>
<td>32</td>
<td>Multiple motor tics</td>
<td>Face, neck</td>
<td>Ear wiggling</td>
<td>OCD</td>
<td>No benefit from CLNZ</td>
<td>Unresponsive to levodopa</td>
<td>Waxing and waning, Improved</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>M</td>
<td>41</td>
<td>Multiple motor tics</td>
<td>Face</td>
<td>Blinking and mannerisms</td>
<td>OCD OCD and anxiety disorder OCD</td>
<td>No benefit from TRHX</td>
<td>Waxing and waning, Improved</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>F</td>
<td>28</td>
<td>Multiple motor tics</td>
<td>Face, neck</td>
<td>Blinking</td>
<td>Tics OCD</td>
<td>No benefit from CLNZ</td>
<td>Improvement on CLNZ</td>
<td>Relapsing-remitting</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>M</td>
<td>61</td>
<td>Throat clearing phonation and multiple motor tics</td>
<td>Face, larynx, neck, shoulders</td>
<td>Unspecified</td>
<td>Tics OCD</td>
<td>No benefit from TRHX, improvement on CLNZ</td>
<td>Waxing and waning, Improved</td>
<td>Stable</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>F</td>
<td>62</td>
<td>Jaw opening tic, abdominal tensing tic</td>
<td>Face, abdomen</td>
<td>Blinking</td>
<td>—</td>
<td>— No benefit from TRHX, BAC</td>
<td>Stable</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>M</td>
<td>63</td>
<td>Multiple phonations, facial tics</td>
<td>Neck, face, abdomen</td>
<td>Facial grimacing</td>
<td>Tics OCD</td>
<td>No benefit from CLNZ</td>
<td>Stable</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>F</td>
<td>29</td>
<td>Single tongue thrusting tic</td>
<td>Tongue</td>
<td>Blinking</td>
<td>—</td>
<td>— No benefit from CLNZ</td>
<td>Stable</td>
<td>12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ALPZ=alprazolam; BAC=baclofen; CLNZ=clonazepam; CLON=clonidine; DZP=diazepam; FLUOX=fluoxetine; HAL=haloperidol; OCD=obsessive compulsive disorder; PMZ=pimozide; TRHX=trihexiphenidyl; VPA=valproate.
recent follow up, the patient described that his
tics were still present but had fluctuated over
the years.

**Case 9**—This 72 year old woman had
developed a stereotyped socially disabling
vocalisation 3 years earlier in the context of
pharyngitis. She developed a harsh expectorating
sound, like a person forcefully clearing their
throat. With time, the vocalisation became more
frequent, stereotyped, and more prominent
when under stress. She described the problem as
a “strainful exudement”. The sound was often
absent, particularly when she was quiet, relaxed,
concentrating on a task, or asleep. On neurologi-
cal examination, the major abnormality was the
vocalisation itself, which sounded like an exag-
gerated, raspy, explosive throat clearing. The
vocalisation did not interrupt speech, chewing,
or swallowing. The vocalisation could be sup-
pressed when she spoke, counted, or even recited
numbers in her head without speaking.
Although never treated for obsessive-compulsive
disorder, the patient had a lifelong compulsive
tendency to keep notes, which she meticulously
catalogued, stored, and revised periodically. She
was especially interested in the act of recording
and the reiteration of detail. There was no
history of neuroleptic exposure or head trauma
before the vocalisation, and no history of child-
hood tics. She underwent trials of phenytoin,
haloperidol, clonidine, trihexiphenidyl, clon-
azezam, pimozide, and baclofen, all in low dose
without benefit.

**Case 10**—This 46 year old man developed
stereotyped facial grimacing during a 2 year
period of daily intranasal cocaine use. He had
been aware of twisting facial movements that
occurred transiently during cocaine intoxica-
tion, but the movements always subsided as the
drug waned. At one point during the
period of cocaine intake, he became aware that
his movements were persisting even when off
the drug. With time, he developed a prominent
complex tic consisting of stereotyped head
turning and rotational shoulder movements.
The movements were only briefly suppressible,
up to 10 seconds. There was no history of pre-
vious tics, neuroleptic exposure, head trauma,
anoxia, or encephalitis. The patient’s sister had
disabling tics. A paternal uncle had stere-
otyped facial winking. The patient declined
treatment for his tics or obsessive rumination.

**Recurrent childhood tics**

**Case 20**—This 62 year old woman developed
sudden brief stereotyped jaw opening, preceded
by a sensory prodrome of skin tightness around
her mouth. By allowing the jaw opening move-
ment to occur, the tightness sensation tempo-
orarily abated. The movement could be sup-
pressed by clenching her teeth tightly together.
She experienced about 10 events daily, without
much change over time. There was no exposure
to neuroleptic drugs. As a 12 year old child, she
recalls being sent home from camp one summer
because of frequent eye blinking attributed to
nervousness that resolved.

**Case 21**—This 79 year old man was referred
for a 16 year history of breathing problems. He
complained of shortness of breath attributed to
abdominal twitching. On examination, he had
a frequent tendency to expel air against a
closed glottis, producing a suppressed cough-
ing sound. In addition, he had frequent
swallowing, snorting, sniffing and panting, all of
which could be temporarily suppressed or dis-
tracted. He also had a stereotyped winking ten-
dency, with tight eyelid closure, and screwing
up the left cheek. The facial grimacing had
been present as a child, but had waned. In the
family history, a nephew had disabling
Tourette’s syndrome, with multiple motor tics
and vocalisations, including coprolalia.

**Case 22**—This patient developed a stere-
otyped tongue movement at the age of 29 during
a particularly stressful period in her life. Her
movement consisted of a tendency for the
tongue to curl back and press itself against the
upper teeth. The tongue movements were
relieved by a dental appliance but this was so
uncomfortable that she eventually stopped
wearing it. The movement stopped for about 1
year after onset but then recurred, and remained
for the next 10 years. The patient described the
tongue movement as transiently suppressible, at
the cost of a sense of rising inner tension. With
each tongue movement, there was transient
nervousness, which also abolished the sensation of asphyxia.
occur during speaking, and there was no dysarthria or other speech impediment. Sometimes during the interview there was a rapid stereotyped lateral jaw deviation to the left, but no other repetitive or stereotyped movements, such as tongue protrusion, sustained posturing, palatal myoclonus, or pharyngeal movements. When she was 5 years old, the patient had had motor tics consisting of blinking, which resolved spontaneously within several months. There was no history of vocalisations, repetitive rituals, obsessions, or other related symptoms.

**Discussion**

Tic disorders newly presenting during adulthood have occasionally been described in the neurological literature, mostly in relation to an acquired brain lesion, as incidental tics in the context of another neurological or psychiatric disease, such as Huntington’s disease. There are few descriptions of primary, or idiopathic, adult onset tics in the literature, and about 55% of reported cases represent recurrences of childhood tic disorders, as shown in table 3. The largest report is that of Klavans and Barr, who described four patients with childhood onset tics that remitted before the age of 21, only to recur after the age of 60. Taken together, the paucity of reports of adult onset tic disorders suggests that they represent an unusual entity, especially idiopathic tic disorders, rarely encountered in clinical practice, in marked contrast to the high prevalence of childhood tic disorders.

The present series of 22 patients is the largest report describing the clinical features of tic disorders presenting during adulthood. In our population, adults newly presenting with tic disorders represent 5.4% of patients of all ages evaluated for tics. We cannot estimate the prevalence of adult onset tic disorders in the general population, but the number of patients we have encountered suggests that the phenomenon is more common than previously reported. When adults present for the first time to a physician for evaluation of a tic disorder, a certain number will have true new onset tics, whereas the rest will prove to have a recurrence of a childhood tic disorder. Among adults with new onset tics, about 50% will have an apparent external precipitant of the disorder. Establishing that an adult patient with apparent new onset tics did not have tics during childhood can rarely be done with certainty because some patients are unaware of their tics, and reliable observers who knew the patient as a child may not be available. As such, it is important to divide adult onset tic disorders into two categories based on the time course of presentation: a new tic disorder after the age of 21 years or the recurrence of childhood tics that had previously resolved. In the present series, the categorical breakdown among 22 patients was: idiopathic new onset tics in seven (32%), new onset secondary tic disorder in six (27%), and recurrent childhood tic disorder in nine (41%).

The clinical features of adult onset tic disorders resemble those described in childhood onset tic disorders. However, the range of tic phenomenology in our population seemed more restricted relative to childhood tics, and the severity of tic disorders was milder. There was little coprolalia, as has been previously noted in childhood tics persisting into adulthood. Automatisms of the type described in autistic children were not found in this sample, but may reflect referral bias, as adults with autistic behaviours are not generally referred to our clinic. In our population, there were no phenomenological differences between patients with de novo adult onset tics and those patients with recurrent childhood tics. Both groups exhibited tics that most often involved the face, neck, and shoulder. Most patients had multiple motor tics. In the series, only six patients had an isolated single tic disorder, but three others had a primary tic that overshadowed a background of multiple, minor tics. Single tics and dominant tics persisted over the full course of the disorder, waxing and waning in severity but not varying in repertoire. In both groups, no patient had a complete remission of their tics in adulthood. Treatment attempts were generally not successful, and rarely sustained. Eventually, most patients elected to discontinue medical treatment, preferring to live with their tics than to experience the side effects of medication.

The concept that obsessive-compulsive disorder is part of the range of neurobehavioral manifestations of Tourette’s syndrome is well accepted, and in our series was present in nine of 22 patients (40.9%).

Disability was not formally quantified in our population, and we could not distinguish disability due to tics from disability caused by attendant psychopathology. In general, patients stated that they were mainly socially disabled by their tics, in agreement with studies describing social embarrassment and isolation as the most disabling consequences of tic disorders. All of our patients were self referred for tics, a referral bias that usually selects for more severely

<table>
<thead>
<tr>
<th>Reference</th>
<th>Age/sex</th>
<th>Clinical description</th>
<th>Family history</th>
<th>Associated psychiatric symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>35 M</td>
<td>New onset</td>
<td>—</td>
<td>Anxiety/depression</td>
</tr>
<tr>
<td>12</td>
<td>46 F</td>
<td>Recurrent</td>
<td>—</td>
<td>none</td>
</tr>
<tr>
<td>13</td>
<td>35 M</td>
<td>New onset</td>
<td>Tic disorder</td>
<td>ADHD</td>
</tr>
<tr>
<td>14</td>
<td>62 F</td>
<td>Recurrent</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>15</td>
<td>53 F</td>
<td>Recurrent</td>
<td>Multiple motor and vocal tics</td>
<td>—</td>
</tr>
<tr>
<td>16</td>
<td>55 M</td>
<td>New onset</td>
<td>Tic disorder</td>
<td>Depression</td>
</tr>
<tr>
<td>17</td>
<td>81 M</td>
<td>New onset</td>
<td>Multiple vocal and phonic tics</td>
<td>—</td>
</tr>
<tr>
<td>18</td>
<td>30 M</td>
<td>New onset</td>
<td>Multiple motor and vocal tics</td>
<td>—</td>
</tr>
</tbody>
</table>

Table 3  Previously reported cases of idiopathic tic disorders occurring during adulthood
affected people. However, based on interviews with the patients and review of the patients’ videotaped neurological examinations, the patients in this series would be considered to have only mild (score 0 to 24) or moderate (score 25 to 39) severity tic disorder, using a standard rating scale. We did not encounter any patient presenting during adulthood with a tic disorder at the extreme end of the severity range, with tics so disruptive and intractable that social, familial, or occupational functioning is all but precluded. All adults with this degree of disease severity followed at our centre developed their disorders during childhood.

The prevalence of symptomatic tic disorders seems significantly higher among adults with new onset tic disorders than for adults with recurrent childhood tics, a finding inferred from the number of published reports of secondary tic disorders in the literature. Adults with new onset tics are also more likely to have an underlying cause or provocative event for their tics than children with tic disorders. By contrast, childhood onset tic disorders are only rarely linked to a specific aetiology. Almost one third of the patients in this series reported the onset of tics after a clear inciting event for their tics than children with tic disorders. The question arises as to whether those with secondary tics would have gone on to develop tics in the absence of the precipitating event. In our cases of secondary tic disorders, and among adult onset post-traumatic cases described in the literature, about half had a history of attention deficit hyperactivity disorder, obsessive compulsive traits, or a family history of tic disorder, or obsessive-compulsive disorder, all biological substrates often linked to primary, or idiopathic, tic disorders.

The true prevalence of adult onset tic disorders remains unknown. Simple observation suggests that tics in adults may not be uncommon, but the phenomenon has not been studied systematically. One difficulty in obtaining an accurate prevalence figure of adult tic disorders is that many people with tics are unaware of their symptoms. People may also be unaware of tics in family members. Tics wax and wane, and are suppressible, sometimes unconsciously, escaping detection even by an expert in a standardised setting. The frequency and intensity of tic disorders decreases with time, making adult cases of tics even more difficult to ascertain. All of these problems may lead to underrecognition of tics, which in turn has likely impeded the development of biological or genetic markers for tic disorders.

Do adult onset tics constitute one end of the range of Tourette’s syndrome? In this series of 22 patients, it would seem that the phenomenology of adult tic disorders, the clinical features, prognosis, family history, and associated neurobehavioural elements are entirely typical of childhood onset tic disorders. The clinical evidence suggests that adult tic disorders are part of a range of illness that includes childhood onset Tourette’s syndrome. We therefore propose that classifications of tic disorders include an adult age category that is subdivided by disease course into tic disorders that persist from childhood, tic disorders that represent a recurrence of transient childhood tics, and genuine new onset adult tic disorders. Within the category of adult onset tics, it also seems important to differentiate primary from secondary tic disorders, and most of the secondary cases will fall into the new onset adult tic disorder category. We anticipate that the classification of tic disorders, now based entirely on clinical criteria, will become clearer with the development of genetic markers.

We are grateful to Dr Paul Greene for his critical review of the manuscript and help with the computerised database, and to Dr Stanley Fahn for his support.

4 Shapiro AK, Shapiro E, Wayne HH. Birth, developmental and family histories and demographic information in Tourette’s syndrome. J Neurol Ment Dis 1972;14:335–44.