For many patients diagnosed with a neuropsychiatric disorder, the ability to drive a car plays a crucial part in their functional autonomy. Surprisingly, there were no data available in a PubMed search performed in March 2011 concerning Tourette's Syndrome and driving ability. According to our knowledge, this is the first report on driving ability in a drug-free Tourette's patient as well as after cannabinoid therapy. Mr. H. was a 42-year-old truck-driver, with Tourette's Syndrome since the age of six. On the day of admittance to our hospital, he exhibited coprolalia, multiple motor tics such as head, arm and leg jerking, and repeatedly standing up and down. Mostly, he was suffering from ruminating obsessive thoughts. Diagnostic tests including lumbar puncture, magnetic resonance imaging, and electroencephalography, did not produce any pathological findings. Neuropsychological testing was unremarkable with regard to attention, memory and executive functions. IQ testing revealed an average level of intelligence. A review of the patient's medical history showed that all standard treatments for tic disorders (dopamine-blocking agents, alpha-2-agonists, clonazepam, and tetrabenazine) had proved ineffective. Although there is still a lack of good controlled evidence to support the use of cannabinoids in treating tics in people with Tourette's syndrome, experimental therapy with Δ9-tetrahydrocannabinol (THC) was started. Within 2 weeks, the daily dose was raised to 15 mg. Tics decreased significantly with scores on the Yale Global Tic Severity Scale being reduced by 75% (Global Severity Score dropping from 89 to 22). Since Mr. H.'s job required daily driving, he asked for a treatment that would not affect his driving skills. Therefore, his driving ability was assessed with computerized tests, according to the German guidelines for road and traffic-safety, in an off/on-design. Both, in the drug-free phase and during THC therapy, the criteria according to German regulations were met in all functional domains investigated (i.e. visual perception, capacity of reaction, concentration and stress tolerance). According to these criteria, a test has to be considered a failure if a patient falls below the threshold of 1 standard deviation below the mean in test parameters (percentage < 16). In comparison with the drug-free phase, there was a clear improvement in concentration (from percentage 39 to 58) and visual perception (from percentage 44 to 72) during THC therapy.


Tourette's syndrome is associated with motor and vocal tics and a range of cognitive and behavioral features. To date, there is a controversial debate whether the use of cannabinoids causes cognitive impairment in healthy subjects. In Tourette's patients, it has been shown that treatment with THC has caused neither acute nor long-term cognitive deficits. Our case study indicates that there seem to be beneficial effects on psychomotor functions related to driving performance under treatment with THC. To highlight this topic, further studies on Tourette's driving under THC-treatment are needed.


Background: Gilles de la Tourette Syndrome (GTS) is a developmental neuropsychiatric disorder characterised by the presence of chronic motor and phonic tics. Drugs currently used in the treatment of GTS either lack efficacy or are associated with intolerable side effects. There is some anecdotal and experimental evidence that cannabinoids may be effective in treating tics and compulsive behaviour in patients with GTS. There are currently no systematic Cochrane reviews of treatments used in GTS. There is one other Cochrane review being undertaken at present, on the use of fluoxetine for tics in GTS.

Objectives: To evaluate the efficacy and safety of cannabinoids as compared to placebo or other drugs in treating tics, premonitory urges and obsessive compulsive symptoms (OCS), in patients with GTS. Search Strategy: We searched the Cochrane Central Register of Controlled Trials (CENTRAL) (in The Cochrane Library Issue 4 2008), MEDLINE (January 1996 to date), EMBASE (January 1974 to date), PsycINFO (January 1887 to date), CINAHL (January 1982 to date), AMED (January 1985 to date), British Nursing Index (January 1994 to date) and DH DATA (January 1994 to date). We also searched the reference lists of located trials and review articles for further information. Selection Criteria: We included randomised controlled trials (RCTs) comparing any cannabinoid preparation with placebo or other drugs used in the treatment of tics and OCS in patients with GTS. Data Collection and Analysis: Two authors abstracted data independently and settled any differences by discussion. Main Results: Only two trials were found that met the inclusion criteria. Both compared a cannabinoid, Δ9-Tetrahydrocannabinol (Δ9-THC), either as monotherapy or as adjuvant therapy, with placebo. One was a double blind, single dose crossover trial and the other was a double blind, parallel group study. A total of 28 different patients were studied. Although both trials reported a positive effect from Δ9-THC, the improvements in tic frequency and severity were small and were only detected by some of the outcome measures. Authors' Conclusions: Not enough evidence to support the use of cannabinoids in treating tics and obsessive compulsive behaviour in people with Tourette's syndrome.


Although cannabis has been used as a medicine for several centuries, the therapeutic properties of cannabis preparations (essentially haschich and marijuana) make them far most popular as a recreational drugs. State of the art Scientific studies on the effects of cannabis were advanced considerably by the identification in 1964 of cannabinoid Δ9-tetrahydrocannadionol (THC),
recognized as the major active constituent of cannabis. Cloning of the centrally located CB1 receptor in 1990 and the identification of the first endogenous ligand of the CB1 receptor, anandamide, in 1992 further advanced our knowledge. Progress has incited further research on the biochemistry and pharmacology of the cannabinoids in numerous diseases of the central nervous system. In the laboratory animal, cannabinoids have demonstrated potential in motion disorders, demyelinizing disease, epilepsy, and as anti-tumor and neuroprotector agents. Several clinical studies are currently in progress, but therapeutic use of cannabinoids in humans could be hindered by undesirable effects, particularly psychotropic effects. CB1 receptor antagonists also have interesting therapeutic potential.


High densities of cannabinoid receptors were found in the basal ganglia and hippocampus, indicating a putative functional role of cannabinoids in movement and behaviour. Anecdotal reports suggested beneficial effects of marijuana in Tourette's syndrome (TS). We therefore interviewed 64 TS patients with regard to use of marijuana and its influence on TS symptomatology. Of 17 patients (27%) who reported prior use of marijuana, 14 subjects (82%) experienced a reduction or complete remission of motor and
vocal tics and an amelioration of premonitory urges and obsessive-compulsive symptoms. Our results provide more evidence that marijuana improves tics and behavioural disorders in TS. It can be speculated that cannabinoids might act through specific receptors, and that the cannabinoid system might play a major role in TS pathology.


To the Editor: Tourette’s syndrome is a complex neuropsychiatric disorder of unknown etiology. Earlier reports suggested beneficial effects in Tourette’s syndrome when smoking marijuana (Cannabis sativa). We report a successful treatment of Tourette’s syndrome with delta-9-tetrahydrocannabinol (Δ9-THC), the major psychoactive ingredient of marijuana.

Mr. A, a 25-year-old man, was diagnosed with attention deficit hyperactivity disorder at age 6. Motor and vocal tics started at age 10. During adolescence, he developed obsessive-compulsive behavior, anxiety, lack of impulse control, and self-injurious behavior. The diagnosis of Tourette’s syndrome according to DSM-IV criteria was made at age 22. At age 19, he started smoking marijuana. When using 2–3 g/day, he noted a marked improvement of both vocal and motor tics and associated behavioral disorders. Therefore, he stopped less effective medical treatment with pimozide.

In an uncontrolled open clinical trial, we investigated whether Δ9-THC is effective in the therapy of Tourette’s syndrome. Written informed consent was obtained from the patient after complete description of the study. The local ethics committee approved the study.

Mr. A was treated once with 10 mg of Δ9-THC. (He was unmedicated and had stopped smoking marijuana 3 days before.) Using the section on tic symptoms of the Tourette’s Syndrome Global Scale, we found that Mr. A’s total tic severity score was 41 before treatment and was reduced to 7 just 2 hours after treatment. Both motor and vocal tics improved and coprolalia disappeared. The improvement began 30 minutes after treatment and lasted for about 7 hours; no adverse effects occurred. To measure cognitive functions, we performed neuropsychological tests, which showed improved signal detection and sustained attention and reaction time after treatment. Mr. A himself noted an improvement of motor and vocal tics of about 70%. Furthermore, he felt an amelioration in attention, impulse control, obsessive-compulsive behavior, and premonitory feeling.

This is the first report of a successful treatment of Tourette’s syndrome with Δ9-THC. Furthermore, for the first time, patients’ subjective experiences when smoking marijuana were confirmed by using a valid and reliable rating scale and by excluding the fact of using an illegal drug. In addition, our findings give evidence that beneficial effects of marijuana may be due to the most psychoactive ingredient—Δ9-THC. So far, it is unclear whether beneficial effects are caused by unspecific mechanisms like reduction of anxiety, sedation, or placebo effects. We hypothesize, however, that there may be an interaction between Δ9-THC and specific cannabinoid receptors located in basal ganglia. We are planning to confirm these preliminary results in a double-blind, placebo-controlled, crossover study.

Previous studies have suggested that marijuana (cannabis sativa) and Δ-9-tetrahydrocannabinol (Δ-9-THC), the major psychoactive ingredient of marijuana, are effective in the therapy of tics and associated behavioral disorders in Tourette Syndrome (TS). Because there is also evidence that cannabis sativa may cause cognitive impairment in healthy users, we performed a randomized double-blind placebo-controlled crossover trial for Δ-9-THC in 12 adult TS patients to investigate whether treatment of TS with a single dose of Δ-9-THC at 5.0 to 10.0 mg causes significant side effects on neuropsychological performance. Using a variety of neuropsychological tests, we found no significant differences after treatment with Δ-9-THC compared to placebo treatment in verbal and visual memory, reaction time, intelligence, sustained attention, divided attention, vigilance, or mood. Only when using the Symptom Checklist 90-R (SCL-90-R) did our data provide evidence for a deterioration of obsessive-compulsive behavior (OCB) and a trend towards an increase in phobic anxiety. However, these results should be interpreted with caution as SCL-90-R has known limitations on measuring OCB. We suggest that the increase in phobic anxiety is mainly due to the fact that a single-dose treatment rules out the possibility of administering the dosage slowly. In contrast to results obtained from healthy marijuana users, a single-dose treatment with Δ-9-THC in patients suffering from TS does not cause cognitive impairment. We therefore suggest that further investigations should concentrate on the effects of a longer-term therapy of TS with Δ-9-THC.


dass Cannabinoide eine Erweiterung des therapeutischen Spektrums in der Behandlung von Bewegungsstörungen darstellen werden.


Animal studies suggest that cannabinoid receptor agonists might enhance the effect of dopamine receptor antagonists (neuroleptics, NL) in hyperkinetic movement disorders. In Tourette syndrome, NL are the most effective drugs for the treatment of tics. Recent clinical trials demonstrated that Δ-9-tetrahydrocannabinol (Δ-9-THC) also produces a tic-suppressing effect. In this single case study in a 24 years old female suffering from TS with extreme tics, it is suggested for the first time that Δ-9-THC may be useful in augmenting the pharmacological response to atypical NL such as amisulpride and risperidone in TS patients. No serious adverse reactions occurred. Controlled studies are necessary to confirm this initial report.


Correct education of the patient is one of the most important aspects in the treatment of Tourette's syndrome. Pharmacotherapy is often unsatisfactory and therefore should be limited to those patients who are significantly impaired. Therapy must be individualised and the most troublesome symptom should be targeted first. In the treatment of tics, dopamine receptor blocking agents are currently the most effective drugs. It is currently unknown whether classic neuroleptics, such as pimozide, selective dopamine receptor antagonists, such as sulpiride, or newer atypical antipsychotics, such as risperidone, have the best adverse effect profile. Tiapride can be used as an alternative, particularly in children. Selective serotonin-re-uptake inhibitors are recommended for the treatment of obsessive-compulsive behaviour. In children suffering from attention deficit hyperactivity disorder, psychostimulants, such as methylphenidate, are the treatment of choice. Recent studies have provided increasing evidence that stimulants do not cause a significant increase in tics in the majority of patients.


Anecdotal reports in Tourette's syndrome (TS) have suggested that marijuana (cannabis sativa) and Δ-9-tetrahydrocannabinol (Δ-9-THC), the major psychoactive ingredient of marijuana, reduce tics and associated behavioral disorders. We performed a randomized double-blind placebo-controlled crossover single-dose trial of Δ-9-THC (5.0, 7.5 or 10.0 mg) in 12 adult TS patients. Tic severity was assessed using a self-rating scale (Tourette's syndrome Symptom List, TSSL) and examiner ratings (Shapiro Tourette's syndrome Severity Scale, Yale Global Tic Severity Scale, Tourette's syndrome Global Scale). Using the TSSL, patients also rated the severity of associated behavioral disorders. Clinical changes were correlated to maximum plasma levels of THC and its metabolites 11-hydroxy-Δ-9-tetrahydrocannabinol (11-OHTHC) and 11-nor-Δ-9-tetrahydrocannabinol-9-carboxylic acid (THC-
Using the TSSL, there was a significant improvement of tics (p = 0.015) and obsessive-compulsive behavior (OCB) (p = 0.041) after treatment with Δ-9-THC compared to placebo. Examiner ratings demonstrated a significant difference for the subscore "complex motor tics" (p = 0.015) and a trend towards a significant improvement for the subscores "motor tics" (p = 0.065), "simple motor tics" (p = 0.093), and "vocal tics" (p = 0.093). No serious adverse reactions occurred. Five patients experienced mild, transient side effects. There was a significant correlation between tic improvement and maximum 11-OH-THC plasma concentration. Results obtained from this pilot study suggest that a single-dose treatment with Δ-9-THC is effective and safe in treating tics and OCB in TS. It can be speculated that clinical effects may be caused by 11-OH-THC. A more long-term study is required to confirm these results.


Currently, the treatment of Tourette's syndrome (TS) is unsatisfactory. Therefore, there is expanding interest in new therapeutical strategies. Anecdotal reports suggested that the use of cannabis might improve not only tics, but also behavioural problems in patients with TS. A single-dose, cross-over study in 12 patients, as well as a 6-week, randomised trial in 24 patients, demonstrated that Δ-9-tetrahydrocannabinol (THC), the most psychoactive ingredient of cannabis, reduces tics in TS patients. No serious adverse effects occurred and no impairment on neuropsychological performance was observed. If well-established drugs either fail to improve tics or cause significant adverse effects, in adult patients, therapy with Δ-9-THC should be tried. At present, it remains unclear whether herbal cannabis, different natural or synthetic cannabinoid CB1-receptor agonists or agents that interfere with the inactivation of endocannabinoids, may have the best adverse effect profile in TS.


Previous studies provide evidence that marijuana (Cannabis sativa) and delta-9-tetrahydrocannabinol (Δ-9-THC), the major psychoactive ingredient of marijuana, respectively, are effective in the treatment of tics and behavioral problems in Tourette syndrome (TS). It, therefore, has been speculated that the central cannabinoid receptor system might be involved in TS pathology. However, in healthy marijuana users there is an ongoing debate as to whether the use of cannabis causes acute and/or long-term cognitive deficits. In this randomized double-blind placebo-controlled study, we investigated the effect of a treatment with up to 10 mg Δ-9-THC over a 6-week period on neuropsychological performance in 24 patients suffering from TS. During medication and immediately as well as 5-6 weeks after withdrawal of Δ-9-THC treatment, no detrimental effect was seen on learning curve, interference, recall and recognition of word lists, immediate visual memory span, and divided attention. Measuring immediate verbal memory span, we even found a trend towards a significant improvement during and after treatment. Results from this study corroborate previous data suggesting that in patients suffering...
from TS, treatment with Δ-9-THC causes neither acute nor long-term cognitive deficits. Larger and longer-duration controlled studies are recommended to provide more information on the adverse effect profile of THC in patients suffering from TS.


Background: Preliminary studies suggested that Δ-9-tetrahydrocannabinol (THC), the major psychoactive ingredient of Cannabis sativa L., might be effective in the treatment of Tourette syndrome (TS). This study was performed to investigate for the first time under controlled conditions, over a longer-term treatment period, whether THC is effective and safe in reducing tics in TS. Method: In this randomized, double-blind, placebo-controlled study, 24 patients with TS, according to DSM-III-R criteria, were treated over a 6-week period with up to 10 mg/day of THC. Tics were rated at 6 visits (visit 1, baseline; visits 2-4, during treatment period; visits 5-6, after withdrawal of medication) using the Tourette Syndrome Clinical Global Impressions scale (TS-CGI), the Shapiro Tourette-Syndrome Severity Scale (STSSS), the Yale Global Tic Severity Scale (YGTSS), the self-rated Tourette Syndrome Symptom List (TSSL), and a videotape-based rating scale. Results: Seven patients dropped out of the study or had to be excluded, but only 1 due to side effects. Using the TS-CGI, STSSS, YGTSS, and video rating scale, we found a significant difference (p <.05) or a trend toward a significant difference (p <.10) between THC and placebo groups at visits 2, 3, and/or 4. Using the TSSL at 10 treatment days (between days 16 and 41) there was a significant difference (p <.05) between both groups. ANOVA as well demonstrated a significant difference (p =.037). No serious adverse effects occurred. Conclusion: Our results provide more evidence that THC is effective and safe in the treatment of tics. It, therefore, can be hypothesized that the central cannabinoid receptor system might play a role in TS pathology.


gelang, die korrekte chemische Struktur von delta-9-Tetrahydrocannabinol (A9-THC), dem am stärksten psychotrop wirksamen Inhaltsstoff der Cannabispflanze, zu ermitteln. In der Folgezeit wurde eine große Zahl weiterer Inhaltsstoffe identifiziert; derzeit sind insgesamt 483 derartige Substanzen bekannt, davon 66 verschiedene Cannabinoide (neben A9-THC u.a. Cannabidiol (CBD), Cannabigerol (CBG), Cannabichromen (CBC), Cannabinol (CBN)).


Cannabinoidrezeptor-System und neurologische Bewegungsstörungen


Die höchste Dichte zentraler CB1-Rezeptoren findet sich in den Basalganglien, und dort wiederum in den Ausgangsstationen, das heißt auf Neuronen, die vom Striatum (Putamen und Nucleus caudatus) zur Substantia nigra pars reticulata (SNr) und zum Globus pallidus (GP) projizieren. Diese Lokalisation legt nahe, dass den CB1-Rezeptoren eine besondere Rolle in der Bewegungskontrolle zukommt. Weiterhin sprechen viele Daten dafür, dass Endocannabinoide als Neuromodulatoren wirken. So konnten Wechselwirkungen mit allen innerhalb der Basalganglien funktionell bedeutenden Transmittern (Gamma-Amino-Buttersäure (GABA), Glutamat, und Dopamin) nachgewiesen werden.

Eine hohe CB1-Rezeptordichte findet sich auf GABAergen Neuronen, die vom Striatum zum GP und zur SNr projizieren. Im Globus pallidus lateralis (GPI) wird durch Cannabinoide die GABA-Wiederaufnahme vermindert und somit die GABAerge Hemmung verstärkt. Tierexperimentell führt dies zu einer Abnahme der Willkürmotorik und dem Eintreten parkinsonartiger Symptome. Weiterhin ist eine komplexe Wechselwirkung mit dem dopaminergen System anzunehmen. Sowohl Dopamin D1 als auch D2-Rezeptoren finden sich in unmittelbarer Nähe zu CB1-Rezeptoren auf Neuronen, die vom Striatum zum GP und zur Substantia nigra (SN) projizieren. Eine im Tierexperiment durch Cannabinoidrezeptor-Agonisten herbeigeführte Katalypse kann durch eine Dopamin D1-Rezeptorenstimulation verstärkt werden. Durch Cannabinoide induzierte Rotationsbewegungen können durch Dopamin D1 und D2-Rezeptorantagonisten blockiert werden. Schließlich konnte nach lokaler


Nebenwirkungen

Tourette's syndrome (TS) is a chronic disorder characterized by motor and vocal tics and a variety of associated behaviour disorders. Because current therapy is often unsatisfactory, there is expanding interest in new therapeutic strategies that are more effective, cause less side effects and ameliorate not only tics but also behavioural problems. From anecdotal reports and preliminary controlled studies it is suggested that - at least in a subgroup of patients - cannabinoids are effective in the treatment of TS. While most patients report beneficial effects when smoking marijuana (Cannabis sativa L.), available clinical trials have been performed using oral Δ-9-tetrahydrocannabinol (THC). In otherwise treatment-resistant TS patients, therefore, therapy with THC should not be left unattempted. To date, it is unknown whether other drugs that interact with the endocannabinoid receptor system might be more effective in the treatment of TS than smoked marijuana or pure THC. Since it has been suggested that abnormalities within the endocannabinoid receptor system might underlie TS pathophysiology, it would be of interest to investigate the effect of substances that for example bind more selectively to the central cannabinoid receptor or inhibit the uptake or the degradation of different endocannabinoids.


Cannabinoids have been used for hundred of years for medical purposes. Today, the cannabinoid Δ-9-tetrahydrocannabinol (THC) and the cannabis extract nabiximols are approved for the treatment of nausea, anorexia and spasticity, respectively. In Tourette syndrome (TS) several anecdotal reports provided evidence that marijuana might be effective not only in the suppression of tics, but also in the treatment of associated behavioural problems. At the present time there are only two controlled trials available investigating the effect of THC in the treatment of TS. Using both self and examiner rating scales, in both studies a significant tic reduction could be observed after treatment with THC compared to placebo, without causing significant adverse effects. Available data about the effect of THC on obsessive-compulsive symptoms are inconsistent. According to a recent Cochrane review on the efficacy of cannabinoids in TS, definite conclusions cannot be drawn, because longer trials including a large number of patients are missing. Notwithstanding this appraisal, by many experts THC is recommended for the treatment of TS in adult patients, when first line treatments failed to improve the tics. In treatment resistant adult patients, therefore, treatment with THC should be taken into consideration.


The Authors review the pharmacology, effects and side-effects of cannabinoids, notably Δ-9-tetrahydrocannabinol (THC), cannabidiol, nabilon or dronabinol, with reference to their positive effects on multiple sclerosis, bone marrow disorders, cerebrovascular accident, head injuries, Parkinson's disease, Huntington's chorea, Tourette's syndrome, epilepsy, migraine,
trigeminal neuralgia, arthritis, post-operative, menstrual and phantom pain, glaucoma, nausea and vomiting after chemotherapy and loss of appetite in AIDS and cancer patients, in some cases compared to conventional therapy with metoclopramide, prochlorperazine, haloperidol, ondansetron, diltiazem or verapamil. Side-effects include exacerbation of respiratory disorders or schizophrenia and possible teratogenic effects.


Although a variety of pharmacological agents have been reported to attenuate symptoms of Tourette's syndrome (TS), the pathophysiology of this disorder remains unknown. Apart from the presence of disabling motor and vocal tics, TS patients often experience behavioral disturbances including obsessive compulsive thoughts, anxiety, depression, abnormal sleep disturbances. Drug abuse to obtain relief from the chronic anxiety may be common among these patients. We recently encountered three patients with TS who experienced incomplete responses to conventional anti-TS drugs but noted a significant amelioration of symptoms when smoking marijuana.

The first patient was a 15-year-old boy who, in addition to motor tics, had obsessive compulsive and self-mutilatory behavior improved with administration of imipramine (37.5 mg/day) combined with the oral opiate receptor antagonist naltrexone (dose range 50 to 100 mg/day). During recreational use of marijuana (1 to 2 cigarettes/day), he noted general relaxation and marked lessening in his urge to tic. According to the patient's mother, motor tics had decreased by about 50% and there was also some reduction in the frequency of the self-mutilatory behavior. The patients had been smoking marijuana for 4 weeks, and upon discontinuation, noted rebound exacerbation of symptoms within 12 hours.

The second patient, age 17, had had severe motor tics since the age of 7 years. He had frequent jerk-type movements of his neck muscles associate with infrequent vocalizations during stressful situations. His management had been difficult as he was unable to tolerate haloperidol or clonidine. Administration of naltrexone (150 mg/day) reduced his anxiety level and the urge to tic; this was the only drug he could tolerate. On several occasions, he had smoked marijuana and noted generalized relaxation accompanied by reduction in the severity of the motor tics and improvement in attention span. He volunteered that smoking one cigarette reduced the frequency of his motor tics by about 60% to 70%, which was sustained over several hours.

The third patient was a 39-year-old man who had had symptoms of TS since the age of 9 years. His symptoms included frequent jerking-type movements of his neck and upper extremity muscles, facial grimacing, frequent blinking, and leg jerking. Vocalizations were not noted except during extreme anxiety. In addition he was troubled by chronic insomnia and hypersexuality. He reported no benefit from haloperidol, clonidine, or benzodiazepines but experienced some relief after consuming large amounts of ethanol. He also admitted that marijuana smoking (1/2 to 1 cigarette/day) produced relaxation with subsequent reduction in the severity of the motor tics along with marked attenuation of his hypersexuality.

From 1842 to the turn of this century, several reports in the literature have indicated that marijuana smoking was used extensively as an analgesic, sedative, and hypnotic agent. (4) Moreover, oral cannabis preparations were
useful in the management of diverse neurological conditions including convulsions and chorea. Much more recently it was reported anecdotally that patients with dystonia improved with their alleged cannabis smoking. The cannabis constituent cannabidiol was reported efficacious in reducing symptoms of dystonia and Huntington’s chorea. In experimental animals, cannabidiol has been shown to exert anticonvulsant and antianxiety properties and affect apomorphine-induced turning behavior in rats. (10) The latter report suggested that cannabidiol exerts antidyskinetic effects through modulation of striatal dopaminergic activity. Tetrahydrocannabinol (THC, the active compound of marijuana) may exert GABA-ergic as well as antiserotonergic effects. A recent report has demonstrated that THC reduces opiate receptor binding sites and modulates opioid receptors in a noncompetitive manner. THC may also exert effects on the cholinergic system.

Considering evidence that marijuana may exert effects on a large number of neurotransmitters, it is difficult to speculate on its mode of action in attenuating symptoms of TS. It is reasonable to assume that the effects of marijuana in TS may be largely related to its anxiety-reducing properties, although a more specific antidyskinetic effect cannot be excluded. Should marijuana compounds prove to have specific actions in TS, chemical modifications which eliminate the psychoactive properties while retaining the antidyskinetic effects (e.g., cannabidiol) could promise a new class of drugs useful in the management of TS. Further studies are clearly needed in both the clinical and basic laboratory realms to further characterize the effects of cannabinoids in TS.


An association of patients with Gilles de la Tourette syndrome enabled us to gather a large body of information regarding the disease manifestations, and patient-perceived consequences. Method 350 questionnaires were sent to patients belonging to the AFSGT (French Association of Patients Suffering from Gilles de la Tourette Syndrome). 187 responses were received (53 percent). The patients were divided into four groups: those with motor tics, vocal tics, complex tics and complex tics with coprolalia. This last group corresponds to the DSM IV definition of "Tourette Disorder". The questions were grouped in five sections: simple manifestations, complex manifestations, family study, treatment and psycho-affective perception (social and in the context of schooling). The study of the simple manifestations of the disorder revealed the homogeneity of the four groups with an age of onset at an average 7 years and a male-to-female ratio of 3.5. The first signs of the disorder are motor tics of the face and neck, and the disorder shows a variable and fluctuating course characterized by periods of decreased or absent symptoms. Familial cases (58 percent) are found in all four groups. The complex signs included in part of behaviors corresponding to the definition of tics: sudden, brusque, repetitive, varied, escape despite efforts to repress them and reappearance more intensely after a period of conscious control. The complex signs also consisted of accompanying factors such as agitation, need to organize, classify or count. Treatments have been of limited success and a significant number of patients have abandoned treatment entirely. Our study demonstrates that this condition seriously affects the daily life of patients, including family and social relations, schooling and occupational life.
No patients suffering from transient tics responded to our survey, but such tics were reported in family members. Overall, the condition is considered to be single family of disorders, despite the broad phenotypic spectrum, from transitory cases by children to very severe forms. Escape despite efforts to repress tics and the rebound after control tics is characteristic of the Georges Gilles de la Tourette syndrome.