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Tics

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Tics are an incontinent form of non-verbal communication associated with obsessional and aggressive urges and anxiety. The motor phenomena seen in socially acceptable forms of emotional release are compared and contrasted with tics. It is proposed that brain dysfunction in Gilles de la Tourette syndrome involves frontal limbic and basal ganglia loops.

Introduction

Tics are abrupt, jerky, repetitive movements which are under a degree of voluntary control but which are frequently associated with an involuntary, subjective feeling or urge. They are forms of non-verbal communication which are difficult to interpret because they occur as an expression of some inner emotional conflict or turmoil. The term "jumping for joy" indicates the close link between particular body movements and feeling. The commonest tics are eye winks, head tosses and facial grimaces. They tend to be worse at times of stress, tiredness or boredom and are typically situation specific. The word "tic" is onomatopoeic and was first used in seventeenth century French to describe an unsightly muscular caprice. It was then used in the nineteenth century to describe behavioural vices in domesticated animals and the pejorative American slang term "jerk" and the description of an individual as "twitchy" imply that in the lay mind these sorts of movements are associated with a highly strung neurotic personality. The syndrome described by Georges Gilles de la Tourette is the most severe clinical syndrome and is characterized by multiple motor tics combined with inapposite vocalizations which wax and wane in severity and change in expression over time. Most severe ticqueurs also exhibit a galaxy of complex movements including compulsions, stereotypies, mannerisms and antics. The disorder is frequently lifelong, but remissions can occur. Depression, hostility and obsessionality are associated and about a quarter of patients have copro- and/or echomimia.

Although as Oscar Wilde pointed out it is not wise to find symbols in everything that one sees, one cannot help but be struck by the aggressive and sexual display of many patients with severe Gilles de la Tourette syndrome. An understanding of normal body language is essential if one is to try to make sense of this extraordinary motor behaviour. Non-verbal communication is the language of gesture which transmits ideas, emotions, thoughts and feelings. It is a richer, more archaic and fundamental language than speech. Non-verbal signals have a much smaller vocabulary—about ten facial

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expressions for example. The most extensive linked vocabulary is in the area of gestures, but many of these are direct emblematic translations of verbal phrases. However, non-verbal signals can be put together to produce communications with more complex meanings. If an inconsistent pattern is presented as occurs with tics or in schizophrenia then the total signal is regarded as odd or quirky. Sometimes non-verbal gestures such as the head nod for "yes" may substitute for verbal acts. Most non-verbal communication does not have meaning except in the sense of conveying information to another person with respect to choice that has to be made; however, signs may have a meaning by being the opposite of other signs such as the signals for dominance and submission and the gestures for yes and no. On the other hand the expression of emotion and the negotiation of interpersonal relationships in man is done almost entirely non-verbally. Non-verbal signals for interpersonal attitudes are more powerful than verbal cues, and when words and facial expression are in conflict the non-verbal language is the most dependable in reflecting the true sentiments of the speaker. Langer (1942) first suggested that there were two kinds of communication, one based on logic and language and a second designed to express and articulate feelings by means of non-verbal symbolism. This more primitive "emotional speech system" is probably located in the cingulate cortex and limbic network.

Aggression and Hostility in Gilles de la Tourette Syndrome

About a third of patients with Gilles de la Tourette syndrome have uncontrollable temper tantrums, often preceding the onset of their tics (Stefl, 1983). The body language of many patients with Tourette's syndrome is hostile and aggressive and the verbal utterances are loud, staccato and truculent. Close similarities between the aggressive facial emblems of chimpanzees and the facial grimaces of some patients with Gilles de la Tourette syndrome can be seen. Patients with Tourette's syndrome frequently yell, scream, kick, hit out, scratch, bite and punch. Children with Gilles de la Tourette syndrome are frequently described by their families as irritable and short-tempered with a tendency to vent aggression on those least likely to retaliate and male childhood ticqueurs often terrorise and threaten their mothers and sisters; a description of a Jekyll and Hyde personality is often volunteered. In a recent study carried out at the National Hospital for Nervous Diseases we found a high incidence of hostility and obsessionality in 90 patients with Gilles de la Tourette syndrome. There was a significant association between these traits and the presence of copro-phenomena. Twenty-eight of the patients had been physically aggressive to other people, particularly family members, and there was a significant association with the symptom of being forced to touch, and copropraxia. On the hostility and direction of hostility questionnaire (HDHQ, Caine *et al.*, 1967) extrapunitive rather than intrapunitive scores were maximally observed which is the opposite of what would be expected if the syndrome represented repressed hostility as suggested in the

past by psychoanalytical theorists (Robertson *et al.*, 1988). However, 30 of our patients exhibited self-injurious compulsive behaviour, 14 of whom were head-bangers and this correlated to some degree with the severity of the disorder and psychopathology, particularly the association of obsessionality and hostility measures. No evidence of cognitive impairment was found. Some of these behaviours occur in relation to self-destructive obsessions whereas others seem to be impulsive stereotypies (Robertson *et al.*, 1989). Uncontrollable aggressive outbursts in public leading to confrontation with the law occasionally occurred. One patient in particular had a recurrent impulse to smash windows which had resulted in inappropriate containment in prison for many months. More than a third of our patients had troublesome obsessional-compulsive behaviour and the scores on the Crown Crisp experiential index and the Leyton obsessional inventory were considerably higher than those reported in normal populations. High hostility ratings, high obsessional scores, copro- and echophenomena and a feeling of being forced to touch all seem to be associated. A number of patients had obsessional fears of doing harm to their family or, less often, other people (Robertson *et al.*, 1988).

Yaryura-Tobias and Neziroglu (1978) described a compulsive-orectic mutilative syndrome in a group of female patients in which anorexia or bulimia occurred in association with obsessional-compulsive behaviour, self-mutilation and aggression. These patients responded well to clomipramine, a 5-H-T uptake blocker. They have also delineated a syndrome in which aggressive behaviour, particularly at home, associated with swearing and verbal insults is related to disturbances in blood sugar (Yaryura *et al.*, 1975). The Klouver-Bucy syndrome due to massive damage to both temporal lobes may lead to both hypersexuality and sham rage. Pilleri and colleagues (1965) report a case in which severe neocortical hippocampal and cingulate lesions led to akinetic mutism and a locked-in syndrome. External stimulation of this patient however, consistently led to baring of teeth and aggressive howling. The accounts of klazomania during the encephalitis lethargica pandemic also report coprolalia and uncontrollable aggression. Stimulation of the amygdala may lead to outbursts of shouting, swearing and threatening behaviour and a medial amygdalectomy is effective in humans in reducing aggression. Hitchcock and Cairns (1973) report swearing, aggressive shouts and threats of violence with restless destructive behaviour on stimulation of the amygdala in a group of patients with uncontrollable violence. Delgado (1974) has shown that spontaneous aggression in monkeys can be inhibited by radio stimulation of the head of the caudate nucleus.

The use of obscene signals by man is in many instances a substitute for aggression. Sexual actions in animals are threatening devices used as a method of dominance. For example, male monkeys may mount more submissive males briefly in order to show their superiority. The nearer an action is to copulatory climax the more likely it is to be taboo and it is these obscene signals which are most frequently used by patients with Gilles de la Tourette syndrome. For example, the vulgarly friendly wink or wolf whistle

is much more socially acceptable than the palmback V sign or a shout of "fuck". The use of these sexual activities as a source of dirty words and dirty gestures relates to their use as a form of aggressive display. Obscene gestures fall into five main groups: male phallic signs, female genital aperture signs, copulatory signs, masturbatory signs and groping signs. The most ancient phallic gesture is probably the middle finger jerk and the middle finger was known as the impudent or obscene finger by the Romans. Obscene gestures, seen in Gilles de la Tourette syndrome, should be looked upon in the same way as threat signals indicating aroused aggression. Sometimes this is channelled into displacement or redirected activity in which patients will smash things or hit themselves. It seems probable that many patients with Gilles de la Tourette syndrome have problems with uncontrollable aggression and that, in their attempts to sublimate this, some is directed into threatening display or self-injurious behaviour.

Study of football supporters reveals complex symbolic repertoires of threatening expressions and insults. For example, the display of English supporters includes pogojumping, synchronized clapping, multiple obscene gestures and menagerie calls which include massed snarls, goaly screams and monkey calls. The emotional display of the players during a match also gives a fascinating insight into the links between emotion and body movements.

Dance and Music

Dance has been used widely in the West as a method of exploring the inner landscape of man's feelings. It is a spontaneous expression of emotion and feelings which uses a language of action, intention and aspiration. It may have ritualistic, religious, social or artistic functions and is also a highly effective form of sexual display; finally it may act as a catharsis for inner emotions and may exorcise destructive tensions. A flagrant expression of emotional release is seen in the writhings and posturings of modern popular dance cults. Dance is also used in primitive societies to build up hostility and gather courage before battle. Flute and dance have traditionally been used as a cure for insanity and a mother wishing to put her fractious baby to sleep does not employ stillness, but rocking and lullabies.

Contemporary concepts about abnormal movements arose out of descriptions of the dancing mania of the Middle Ages. Beginning in 1021 in Kolbig, recurrent outbursts of frenzied uncontrollable mass dancing swept through Europe leading to many deaths. Pilgrimages of the dancers to holy shrines were vividly portrayed by Breughel the Elder and in the engravings of Hondius who depicts the antics of scampering fools and contrasts them with the possessed, with heads thrown back, and uncontrollable limbs helped by warders. The Council of Avignon in the twelfth century forbade leaping and obscene movements in dances which were not unusual activities on the high days of the church year, but in 1374 at Aix la Chapelle on the day of the festival of St John the Baptist another outbreak of dancing mania occurred with vivid hallucinations generally of the Saviour or the Virgin Mary. These dancing epidemics became known at St John's or St Vitus'

dance in Germany and in France as St Guy's dance and are now generally considered to be examples of mass hysteria, although ergot poisoning is an alternative proposition for some.

Most received the generic term of chorea from the Greek work meaning dance. Paracelsus (1493–1541) separated chorea imaginata and chorea lascivia from chorea naturalis, the dancing manias being classed as chorea lascivia. Chorea naturalis he believed to be a milder form where only anxiety, confusion and involuntary spasmodic laughter were present. Up until the end of the nineteenth century tics were called pseudo-chorea, or false chorea. Already by the middle of the nineteenth century mental asylums were using dance as a therapy for the inmates. In 1848 Katherine Drake produced a lithograph entitled the Lunatics Ball which conveyed the impression of harmony through the social activity of the dance. An article on the Lunatics Ball appearing about the same time presents the same picture:

> Their delusions forgotten, many of the patients whirled about in glee which though wild did not exceed the bounds of commonsense propriety, others were merely roused from their apathetic state, and gazed with a slight smile upon the scene
>
> (In *Frank Leslie's Illustrated Newspaper*, 1865)

Jumping, twirling and pirouetting are seen in some patients with Gilles de la Tourette syndrome. The pogo dancing and head banging of the punks of the 1980s and the narcissistic introverted contortions of acid house music are also reminiscent of movements seen in Tourette syndrome.

During his study of eccentrics in Paris, Gilles de la Tourette described a remarkable patient with an overriding compulsion to dance. In the ballrooms a young man known as L'Idiot or Le Danseur was well known and often seen mingling with the crowds. He was always correctly dressed with a flower in his buttonhole and could often be seen frantically trying to gain people's attention by wild arm movements. He would jerk his hat on the end of his cane, run from one end of the floor to the other and jump on the stage of the Moulin Rouge, spurred on by the crowds. As soon as the music stopped he would again mingle unobtrusively with the crowd until the next dance when the whole ritual would be repeated. The man described his compulsion on hearing music to dance as a way of improving his mood and gaining attention. He was said to have suicidal tendencies and to be melancholic and confessed that this adoration for captivating music had to be kept secret from his family (Gilles de la Tourette, 1893).

Gilles de la Tourette Syndrome, Religious Experience and Possession States

Patients with Gilles de la Tourette syndrome are often mistakenly considered to be possessed by evil external forces. The recent box office success the Exorcist is reputedly based on a distorted interpretation of a patient with Gilles de la Tourette syndrome and several of my own patients have been exorcised unsuccessfully. Nevertheless the behaviour of many of the pos-

sessed bears more than a passing similarity to Gilles de la Tourette syndrome and a few ticqueurs do have recurrent obsessions that they might inflict harm or be harmed under the direction of an external force.

Descriptions of possession states are full of accounts of convulsions of the limbs, animal vocalisations and swearing. During the famous mass epidemic of demoniacal possession at Loudun in the seventeenth century:

> One nun fell to the ground blaspheming, in convulsion, lifting up her petticoat and privy parts without any shame and uttering filthy words. Her gestures became so indecent that the audience averted their eyes and she cried out again and again, abusing herself with her hands. At other times the nuns struck their chests and backs of their heads as if they had their necks broken and with inconceivable rapidity . . . their faces became so frightful one could not bear to look at them. Their tongues issued suddenly from their mouths, they uttered curses so horrible and so loud that nothing like it was heard before.

Charcot encouraged his pupils to study artistic masterpieces, witchcraft papers and the commentaries on the saltatory mediaeval epidemics for historical examples of the phenomena then being seen at the Salpétrière. Gilles de la Tourette who was born in Loudun, re-examined the narrative of Sister Jeanne Belcier, the prioress, and with Gabriel Legué he published the only easily accessible autobiographical account by Sr Jeanne of the bizarre happenings in the convent. He concluded that the prioress suffered from a psychiatric illness and that her unrequited love for the debonair Jesuit priest Grandier unleashed a host of conversion symptoms. In his book accounts can be found of striking examples of the paradoxical states of brain activity which are often found mediating obsessional behaviour:

> My mind was often filled with blasphemies and sometimes I uttered them without being able to take any thought to stop myself. I felt for God a continual aversion and nothing inspired me with greater hatred than the spectacle of his goodness and the readiness with which he pardons repentant sinners. My thoughts were often bent on devising ways to displease him and to make others trespass against him. It is true that by the mercy of God I was not free in these sentiments, although at that time I did not know it, for the demon beclouded me in such a way that I hardly distinguished his desire from mine; he gave me, moreover, a strong aversion for my religious calling, so that sometimes when he was in my head I tore all my veils and such of my sisters' as I could lay hands on. I trampled them under foot, I chewed them, cursing the hour when I took the vows. All this was done with great violence, I think that I was not free . . . as I went up for communion the devil took possession of my hand and when I had received the sacred host and had half moistened it, the devil flung it into the priest's face. I know full well that I did not do this action freely, but I am fully assured to my deep confusion that I gave the devil occasion to do it.

Obsessional individuals are particularly at risk of becoming possessed while retaining a state of normal consciousness without hysterical mental dissociation. Their behaviour may include compulsions to curse God, an unnatural and persistent preoccupation with the sexual life of Jesus Christ and an uncontrollable urge to utter blasphemies. These fears and ideas are now rarely attributed to possession by demons, but in the past were responsible for many women being burned at the stake as witches. Charcot was able to induce states of clinical hysteria closely resembling possession states:

> suddenly terrible cries and howling were heard; the body, hitherto agitated by contortions or rigid as if in the grip of tetanus, executed strange movements; the lower extremities crossed and uncrossed, the arms were turned backwards as if twisted, the wrists bent, some of the fingers extended and some flexed, the body was bent backwards and forwards like a bow or crumpled up and twisted, the head jerked from side to side or was thrown far back above a swollen and bulging throat; the face depicted now fright, now anger, and sometimes madness; it was turgescent and purple; the eyes widely open, remained fixed or rolled in their sockets, generally showing only the white of the sclerotic; the lips parted and were drawn in opposite directions showing a protruding and tumefied tongue. (Oesterreich, 1930).

There is also a link between dancing and possession states. Rhythmical dancing and leaping are among the principal methods of inducing a state of ecstasy in which a man feels taken over by a force or being greater than himself. The art of prehistoric hunting peoples depicts men dressed up as and imitating animals. This may have induced feelings of being supernatural, born out of a state of mind markedly different from the ordinary everyday condition. Lycanthropy, the delusion where an individual believes he or she has been transformed into an animal, still occurs as an uncommon feature of severe psychosis (Keck *et al.*, 1988) and the term "barking mad" may derive from the rare, but well-recognized syndrome of individuals in disturbed states of mind emitting dog-like barks instead of speech (Buchanan, 1987).

In early writings on the subject of religious melancholy, the occurrence of poisonous thoughts was afforded a prominent place. It was observed that deeply religious people were particularly susceptible and William James (1942) noted that "the lives of the saints are full of such blasphemous obsessions ascribed invariably to the direct agency of Satan". John Bunyan who underwent a powerful and frightening religious conversion described his intrusive unacceptable blasphemous thoughts as "pollution of the mind". It is fascinating to draw the analogy between this and the obsessional ruminations about fear of contamination which affect so many individuals with primary obsessional-compulsive disorder.

Early records of possession states talk about individuals "speaking in tongues" shouting and gesticulating. This picture is remarkably similar to the revivalist and fundamentalist type of worship in which possession by the spirit of God creates and reinforces convinced faith among people in a highly emotional and suggestible state of mind. John Wesley and his followers used states of possession and trance to inculcate faith and the Quakers would shake and tremble before the Lord with small children foaming at the mouth and roaring aloud. The Walworth Jumpers were a sect founded by Mary Ann Girling who were renowned for their dancing and jumping during meetings. Believers would fall on the floor making trance-like utterances and screaming in religious fervour. A report in the *Times* of February 1875 about Mrs Girling described how after a few sentences of prayer she leapt rhythmically from foot to foot waving her arms with a beckoning motion and repeating sentences. The Shaking Quakers of the United States who were immigrants from Manchester believe in divine revelation and their religious practice includes convulsive movements and

dancing with a particular ritual called the square order shuffle. These religious rituals can be construed as an outward release of tension induced by a life of austerity, humility, hard work, celibacy and a submission of self to a communal way of life.

In the *Survey of Social Dance* published in 1829 an account of the Jumper sect can be found:

> our own country at the present time possesses a sect of jumpers, who seem to imagine that he who leaps highest must be nearest heaven, solemnize their meetings by jumping like kangaroos and justify themselves very conclusively from scripture, because David danced before the Ark—the daughter of Shilah danced in the yearly festival of the Lord—and the child John, the son of Elizabeth, leapt before he was born.

Among the secret societies of the Pueblo Indians are the Holy Fools who perform rituals on sacred occasions. It is not clear whether the Holy Fools are chosen because of their bizarre behaviour or whether they use this to execute their magical powers. However, descriptions of their activities include jumping and bellowing of obscenities. These kinds of phenomena can still be seen in some revivalist churches and snake handling tabernacles in the "Bible Belt" of the United States of America.

Concluding Remarks

Classically the Gilles de la Tourette syndrome begins with facial motor tics which with time grow in force and distribution. The abnormal movements are then joined by audible expirations of air through the larynx leading to inarticulate primitive barks or grunts. Finally the sounds may take on the properties of a phoneme and develop into a compulsive repetitive utterance usually with scatological or violent connotations. According to the German philologist, Noiré, prehistoric man already had a laryngeal sphincter which permitted rises in intrathoracic pressure and hence a considerable increase in voluntary movements. During violent exertion, air might escape through the glottis, producing grunts or groans. This audible accompaniment of muscular effort is now frequently heard on the professional tennis court where it seems fashionable for some players to make a loud grunt following each service. This may serve a purpose both as a threat and as a psychological spur in producing increased force and accuracy of the serve. Noiré believed that this sequence was the starting point of human speech, but rival linguists scorned this simple notion, terming it the "yo heave ho" hypothesis.

Patients with severe Gilles de la Tourette syndrome present a mixture of a comical and threatening appearance to the layman and appear to us as an incontinent caricature of all our inner feelings and bodily expressions. There is considerable evidence that a primitive speech centre resides in the anterior cingulate cortex of the brain and vocalizations including coprolalia can occasionally occur in patients with structural damage to the basal ganglia. Complex partial seizures in the medial or orbital frontal regions produce complex motor automatisms which include kicking, thrashing, rubbing,

chewing, lip-smacking, genital manipulations, screams, shouts and coprolalia (Williamson *et al.*, 1985; Waterman *et al.*, 1987). Functional imaging of the brain has also pointed to subtle abnormalities of neuronal hypofunction in some striatal and cortico-limbic areas in Gilles de la Tourette syndrome. It seems likely therefore that the abnormal behaviour is mediated in medial frontal, limbic and basal ganglia structures and further biological research should concentrate on these regions. One of my patients who attributed his difficulties to deep-seated loneliness, sadness and insecurity defined his condition as a perverse behaviour occurring in response to an irresistible compulsion to want to react against the need for self-restraint in situations where the lack of restraint would produce injury or distress. He considered tics and compulsions to be simple and complex expressions of involuntary urges. He tragically acknowledged these urges to be destructive to his own interests:

> I do these things because I do not want to do them. I am not yet able to conceive of a time when it will be possible for me to think of an urge, feel the full force of it and resist acting on it every time until it gets tired and goes away. I have three options: to fight, to flee or to postpone. The more I repeat an urge the more I have to do it. The less I repeat it the longer I can suppress urges with improved concentration. When simple tics or complex compulsions are carried to their ultimate extreme the result alas is a hysterical, excited abandonment of self-inhibitions to the point of violent offensiveness, destructiveness, self-injury or self-inflicted distress. Violence to others is much rarer. The sufferer becomes a slave to compulsions which result in distress, anxiety, depression and severe loss of control and concentration and weakened will power. The syndrome has devastating effects on concentration, mental speed of uptake, self-discipline, will power, memory and most other essentials required to live a normal working life with reasonable social pleasures. So many of us Tourettes live in a twilight world of unemployed desolation and despair. We are unable to absorb ourselves in therapeutic mental activity because of poor concentration, we are unable to live alone because of destructive regeneration and we are unable to live with people because of our offensive behaviour of which we are desperately embarrassed.

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