Brit. J. Psychiat. (1983), **142,** 296–298

Dopa Dose-Dependent Sexual Deviation

N. P. QUINN, B. TOONE, A. E. LANG, C. D. MARSDEN and J. D. PARKES

Changes in sexual behaviour in patients with Parkinson's disease treated with levodopa are well recognized. Barbeau (1969) was the first to draw attention to "a clear-cut visually evident increase in libido" occurring in at least four out of 62 male parkinsonian patients treated with levodopa. Hyyppa *et al* (1970) reported that among 41 treated patients 10 experienced an increase of libido. De Ajuriaguerra *et al* (1972) reported that 29 out of 202 treated patients spontaneously told the authors of their satisfaction in respect of sexual behaviour. They commented "despite a few complaints from their spouses we do not believe there are any grounds to support the hypothesis of hypersexuality, but rather a more or less complete return to normal". Similarly, Duvoisin and Yahr (1972) found that 8 per cent of a total of 283 patients reported an increase in sexual activity that "generally appeared to represent a partial return towards normalcy". However, hypersexuality during levodopa therapy in parkinsonian patients was seen in senile dements, or as a feature of a more generalized disturbance, e.g. hypomanic behaviour. The subsequent experience of other authors (Bowers *et al,* 1971; Shapiro, 1973; Ballivet *et al,* 1973) has left no doubt that frankly hypersexual behaviour, albeit uncommon, may be provoked by levodopa treatment. Goodwin (1971) reviewed the literature on 908 patients and found an incidence of 0.9 per cent and Shapiro (1973) concurred, with an incidence in the region of 1 per cent of treated patients. Bowers *et al* (1971) reported 7 out of 19 patients on levodopa who indicated an activation of sexual behaviour on a combined scale of feeling and performance at some time during levodopa therapy. They divided the subjects into three groups: firstly patients who showed increased sexual drive apparently independent of motor improvement, secondly others whose sexual drive increased proportionately with their mobility, and thirdly those who developed hypersexual behaviour as part of an acute brain syndrome with an agitated and confused state.

The occurrence of hypomania in subjects taking levodopa has also been described. Murphy *et al* (1971) found six out of seven depressed non-parkinsonian patients with bipolar manic depressive illness became hypomanic on the drug, whereas only one of 11 unipolar psychotic depressive patients developed hypomania; one subject invited groups of female patients and staff to come to bed with him. In their series of parkinsonian patients, de Ajuriaguerra *et al* (1972) reported euphoria "bordering on hypomania" related to levodopa therapy in 22 and hypomania in four out of 202 patients. Goodwin (1971) reported an incidence of 1.5 per cent in 908 patients, stressing that the occurrence of hypomania on levodopa was especially likely when there was a past history of mania.

The true incidence of increased sexual drive and activity among parkinsonian patients with levodopa is difficult to assess since no large group of patients has been systematically questioned on this subject. Moreover a certain reticence on the part of both patient and physician would probably give rise to an underestimate of its frequency. However, in the cases of hypersexuality in the literature, some, but not all, of the subjects showed other evidence of hypomania, and the occurrence of hypomanic and hypersexual symptoms sometimes reached their height at the peak of action of an individual dose of levodopa (O'Brien *et al,* 1971). Ballivet *et al* (1973) reported one patient without any other evidence of hypomania whose hypersexuality temporarily disappeared during the course of a depressive episode, and a further subject in whom it was diminished by the addition of thioridazine. Eighty per cent of reported cases have been men, most of them elderly, and the increased sexual interest has been manifested in a heterosexual direction.

Although not previously reported, the use of dopaminergic drugs may also be associated with unmasking of a latent sexual deviation in parkinsonian patients.

Case 1

This patient developed Parkinson's disease at the age of 35 years. Five years later he had a unilateral thalamotomy and 10 years later was treated with "Sinemet" (carbidopa), benzhexol and amantadine with no psychiatric side effects. Since childhood he had had masochistic fantasies in which he imagined himself being flagellated by a woman. One year after starting "Sinemet" he began bromocriptine treatment. One month later, and over the succeeding year on high doses (120–280 mg/day) of this drug, he

https://doi.org/10.1192/bjp.142.3.296 Published online by Cambridge University Press

experienced an increase of libido, and began beating his back with canes, burning himself with cigarettes, and cutting his buttocks. He also felt a compulsion to undress and exhibit in public but was able to resist it. It was not until his wife discovered his activities by chance that we were alerted to the problem.

Over several months a variety of medications were added to his treatment in an attempt to control these symptoms. Cyproterone 50 mg bd (an anti-testosterone compound) helped slightly, whereas the addition of tiapride 100 mgs tds, haloperidol 1.5 mg bd, pimozide 2 mg tds, metoclopramide 20 mg bd, oxyperamide 5 mg bd, or substantial reduction of bromocriptine dosage all effectively improved his masochistic behaviour, but at the expense of worsening Parkinsonism. When each antagonist drug was stopped, the masochistic behaviour returned.

Finally, the bromocriptine was completely discontinued, with rapid resolution of the patient's deviant behaviour (but worsening Parkinsonism). He has subsequently received lisuride and pergolide; the first gave rise to visual hallucinosis and delusions and the second to an organic confusional state without any sexual disturbance.

Case 2

This man's Parkinsonism began at the age of 44 years. For the preceding two years he had experienced intermittent impotence and bladder dysfunction. He had a longstanding attraction to bondage with an episode at the age of 14 when he dressed in his sister's bathing costume and tied himself up with a rope. Apart from this one occasion he had a normal adolescence, but when he married in his twenties he found his wife sexually unresponsive and took to frequenting a brothel. His requirements were at first quite orthodox but subsequently graduated to bondage. The first marriage broke up, and on remarrying he was able to resume normal sexual activity, although still visiting a prostitute occasionally. At the age of 45 he started treatment with "Sinemet." The initial response was good, but he required increasing amounts of the drug so that by the age of 47 he was taking up to 4 g "Sinemet" per day. At this stage he was experiencing on-off fluctuations, and deprenyl 5 mg bd was added to his treatment.

Over the succeeding months he showed episodes of disturbed behaviour. He experienced severe motor restlessness compelling him to don his track suit and go for midnight sprints. He would also become unusually noisy, over-confident and take unnecessary risks. He called on neighbours to suggest arranging orgies and began binding his testicles with leather thongs. In general, this behaviour occurred at the peak of action of each dose, after which it would subside and he would become contrite and repentant. There was no associated hallucinosis or confusion and no past or family history of manic depressive illness.

When the deprenyl was discontinued and the "Sinemet" dosage reduced these behavioural disturbances also settled. Eighteen months later, when the on-off fluctuations had become increasingly troublesome, he received the direct dopamine agonist pergolide 2 mg tds and the dosage of "Sinemet" was reduced. He again found himself at the mercy of sexual urges. He exposed himself in public lavatories and on three occasions arranged to be bound at his home by men whom he met in them. It was clear that the sessions of bondage were of paramount importance, and the choice of men rather than women to inflict it dictated more by availability than any specific homosexual tendencies. On this occasion there was no other evidence of hyperactivity or mania.

When the patient's wife, who was ignorant of the previous deviant episodes, discovered this behaviour he was admitted urgently due to the domestic crisis that ensued. It transpired that he been hoarding his tablets and then taking several at a time to give himself a boost. On discontinuing the pergolide and taking his "Sinemet" at regular times his urges subsided and he was able to return home to his family.

Discussion

Studies of sexually deviant groups (Gosselin and Wilson, 1980) have shown that the origins of their attractions usually date back to adolescence and that sado-masochistic activity as opposed to fantasy tends to blossom in the fifth decade of life. It is therefore unlikely that the dopamine agonists taken by these two patients were *per se* the cause of their deviant activity. However there was a very temporal and dose-dependent relationship with dopamine agonist treatment, with improvement on reducing or stopping it. Signs of hypomania did not necessarily accompany the emergence of sexually deviant behaviour. Dopamine is known to play an important role in modulating tubero-infundibular function (Dahlstrom and Fuxe, 1965), but the mechanism by which dopaminergic drugs triggered a release of previously latent sado-masochistic traits in these two patients must remain entirely speculative.

The practical consequences of altered sexual behaviour in parkinsonian patients depend very largely on the way in which it affects the family, which has to play such a supportive role in this chronic and progressive disease. For example, a return of former sexual potency in one partner in a couple where the spouse has come to terms with an absence of sexual relations has, on occasion, had catastrophic effects. On the other hand, our first patient was happy to indulge in

https://doi.org/10.1192/bjp.142.3.296 Published online by Cambridge University Press

what he felt was a perfectly harmless solitary activity which, if his wife had not found out, might never have caused any domestic problems or, indeed, been brought to our attention. However, the second patient had already secured a dubious reputation amongst neighbours, friends and acquaintances before his wife learnt of his problem. Cases such as these are no doubt commoner than is realised, and because of the social repercussions physicians should be aware of their occurrence.

References

DE AJURIAGUERRA, J., CONSTANTINIDES, J., EISENRING, J. J. YANNIOTIS, & TISSOT, R. (1972) Behaviour disorders and L-dopa therapy in Parkinson's syndrome. In *Parkinson's Disease (Proceedings of the IVth International Symposium)* (ed. J. Siegfried). Bern: Hans Huber.

BALLIVET, J., MARIN, A. & GISSELMAN, A. (1973) Aspects de l'hypersexualité observée chez le Parkinsonien lors du traitment par la L-dopa. *Annales Medico-psychologiques,* **2,** 515–22.

BARBEU, A. (1969) L-dopa therapy in Parkinson's disease: A critical review of 9 years' experience. *Canadian Medical Association Journal,* **101,** 59–68.

BOWERS, M. B., VAN WOERT, M. & DAVIS, L. (1971) Sexual behaviour during L-dopa treatment for Parkinsonism. *Americal Journal of Psychiatry,* **127,** 1691–3.

DAHLSTROM, A. & FUXE, K. (1965) Evidence for the existence of monoamine neurons in the nervous system. IV. Distribution of monoamine nerve terminals in the central nervous system. *Acta Physiologica Scandinavica* (Suppl.) **247,** 1–85.

DUVOISIN, R. C. & YAHR, M. D. (1972) Behavioural abnormalities occurring in Parkinsonism during treatment with L-dopa. In *L-Dopa and Behaviour* (ed. S. Malitz). New York: Raven Press.

GOODWIN, F. K. (1971) Psychiatric side effects of levodopa in man. *Journal of the American Medical Association,* **218,** 1915–19.

GOSSELIN, C. & WILSON, G. (1980) *Sexual Variations,* pp. 115–118. London: Faber & Faber.

HYYPPA, M., RINNE, U. K. & SONNINEN, V. (1970) The activating effect of L-dopa treatment on sexual function and its experimental background. *Acta Neurologica Scandinavica* (Suppl.) **43,** 223–4.

MURPHY, D. L. BRODIE, H. K. H., GOODWIN, F. K. & BUNNEY, W. E. (1971) Regular induction of hypomania by L-dopa in "bipolar" manic-depressive patients. *Nature,* **229,** 135-6.

O'BRIEN, C. P. DI GIACOMO, J. N., FAHN, S., SCHWARZ, G. A. (1971) Mental effects of high-dosage levodopa. *Archives of General Psychiatry,* **24,** 61–3.

SHAPIRO, S. K. (1973) Hypersexual behaviour complicating levodopa (L-dopa) therapy. *Minnesota Medicine,* **56,** 58–9.

*N. P. Quinn, M.A., M.R.C.P., *Neurological Research Registrar, King's College Hospital, Denmark Hill, London SE5 9RS*

A. E. Lang, M.D., F.R.C.P.(C.), *Honorary Senior Neurological Registrar*

C. D. Marsden, M.Sc., F.R.C.P., M.R.C.Psych., *Professor of Neurology*

J. D. Parkes, M.D., F.R.C.P., *Consultant Neurologist*

University Department of Neurology, Institute of Psychiatry and King's College Hospital Medical School

B. Toone, M.R.C.Psych., M.Phil., M.R.C.P., *Consultant Psychiatrist, The Maudsley and King's College Hospitals*

*Correspondence

(Received 10 August 1982)

https://doi.org/10.1192/bjp.142.3.296 Published online by Cambridge University Press