immune haemolytic anaemia in a patient treated with chlorpropamide; in vitro testing showed cross reactivity with glibenclamide and related compounds. Immune haemolysis in vivo caused by glibenclamide, however, does not seem to have been reported before. The mechanism of haemolysis was compatible with the cephaline type, as a Coombs test gave a positive result with both anti-IgG and anti-C₃ and anti-C₄. This result is caused by a non-specific binding of serum proteins, including IgG and complement, to a damaged or altered erythrocyte surface. The antiglobulin test may give a positive result for many months, as was seen in our patient.

Selective IgA deficiency is the most common form of dysgammaglobulinaemia and is, for unknown reasons, often associated with immunological disorders.⁴ Whether the IgA deficiency and the drug induced haemolytic anaemia in our patient were connected was uncertain.

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Lyme disease presenting as recurrent acute meningitis

The neurological manifestations of Lyme disease have been increasingly recognised in Britain,^{1,2} Muhlemann and Wright identifying 21 cases with such symptoms last year in the United Kingdom and Irish Republic.³ The usual neurological manifestations are fluctuating symptoms of meningoencephalitis with superimposed cranial or peripheral radiculopathy, but although these features are often intermittent, the duration of meningitic symptoms is more like that of chronic meningitis.⁴

We report on a patient with Lyme disease who presented with recurrent acute meningitis and no history of tick bite, cutaneous eruptions, or other systemic symptoms.

Case report

A 55 year old man was admitted in October 1984 with a history of feeling unwell and occipital headaches for two days. He was feverish, and clinical examination showed only slight stiffness of the neck on extreme flexion.

Investigations showed a normal full blood count. Studies of cerebrospinal fluid showed a raised protein concentration (2.4 g/l), a glucose concentration of 5.3 mmol/l, and 240×10^9 leucocytes/l (100% lymphocytes); tests for the presence of bacteria, fungi, and viruses yielded negative results. He was treated with intravenous penicillin 16 megaunits daily for seven days and recovered completely within the next few days. Sixteen months later he was admitted with similar symptoms of short duration and slight stiffness of the neck. Cerebrospinal fluid studies showed a raised protein concentration (0.8 g/l), a glucose concentration of 5.8 mmol/l, and lymphocytes $< 1 \times 10^9$ /l; cultures yielded negative results. He recovered spontaneously within a few days without any specific treatment.

Seven months later he again presented with similar symptoms of one day's duration; examination showed a fever (38°C) with slight stiffness of the neck but no other physical abnormality. Cerebrospinal fluid contained 60×10^9 leucocytes/l (95% polymorphs); the protein concentration was 1.8 g/l and glucose concentration 4.2 mmol/l. Cultures for *Mycobacterium tuberculosis* and tests for fungi and viruses yielded negative results. A repeat examination of cerebrospinal fluid after seven days showed 196×10^9 leucocytes/l (100% lymphocytes), a protein concentration of 1.13 g/l, and a glucose concentration of 4.7 mmol/l. A computed tomogram of the brain showed no abnormality. Intravenous penicillin 16 megaunits daily was started on the second day of admission, and he made a complete recovery within the next 24 hours. Treatment was continued for two weeks, and he had no further complications. An indirect immunofluorescence test for antibodies to *Borrelia burgdorferi* yielded a positive result. Seven weeks after admission his serum IgG titre was 1/256 and IgM titre negative. A further sample of serum 10 days later had an IgG titre of 1/64 and a negative IgM titre.

Comment

Our patient had two symptom free periods of 16 and seven months, respectively, between three episodes of acute meningitis. Serological tests were done only during the last admission. Although we cannot exclude the possibility of reinfection, which is known to occur in Lyme disease,⁵ we believe that these episodes were recurrences. The first episode occurred after the patient had worked on a road in a deer forest. He had not done this before the second and third episodes, and the presenting symptoms were similar on each admission. The subsequent episodes are therefore unlikely to have been due to reinfection as he did not develop the more common dermatological and systemic symptoms before either of them. Inadequate treatment of the first episode is also unlikely because the intervals between attacks were too long.

Recurrent meningitis is often difficult to diagnose. The natural course of bacterial, fungal, and viral meningitis is well understood, but in some cases it may be exceptionally difficult to establish the source of infection. When only neurological symptoms are present a diagnosis of Lyme disease may not be obvious.²

Patients with recurrent episodes of aseptic meningitis should have serological tests for *B. burgdorferi* even if there is no history of tick bite or cutaneous lesions; if Lyme disease is diagnosed early high dose intravenous penicillin can shorten the duration of meningitic symptoms.

We thank Dr D J M Wright, Department of Medical Microbiology, Charing Cross Hospital, London, for his help with the serological tests for Lyme disease.

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Bromocriptine induced impotence in Parkinson's disease

Increased sexual drive may be common in patients with Parkinson's disease receiving treatment with levodopa or dopamine agonists.¹ The incidence of a true "aphrodisiac" effect, however, is difficult to assess. Frankly hypersexual or deviant behaviour occurs rarely and is usually associated with an acute brain syndrome or history of hypersexuality.²

Though diminished libido is a common feature of Parkinson's disease,³ impotence related to dopaminergic treatment has not been reported. We describe four men with idiopathic Parkinson's disease with no history of sexual difficulty who spontaneously complained of impotence associated with dopamine agonist (bromocriptine) treatment.

Case reports

Case 1—A 59 year old man was receiving treatment with incremental doses of bromocriptine. After seven months, when the total daily dose was increased from 45 mg to 60 mg and good control of the parkinsonian symptoms had been gained, he became impotent. In spite of noticeably increased sexual urge he achieved erections only transiently and penetration was impossible. When the dose was reduced to 30 mg daily erectile function returned to normal, with worsening of the parkinsonian symptoms. Subsequent increases in the dose of bromocriptine invariably produced impotence. A combined regimen, however, of levodopa (Sinemet-Plus, one tablet three times daily) and bromocriptine (5 mg three times daily) resulted in good control of Parkinson's disease and normal sexual drive and erectile function.

Case 2—A 34 year old man was receiving incremental doses of bromocriptine. After four months (22.5 mg daily) he experienced inability to sustain erections. When the dose was reduced to 11.25 mg daily normal sexual function returned.

within two days, but his parkinsonian symptoms worsened. Levodopa (Sinemet-Plus, one tablet three times daily) was introduced. After one month he reported occasional episodes of impotence. The dose of bromocriptine was reduced further to 5 mg daily, and he reported dramatic improvement in sexual function. Unwilling to continue treatment with bromocriptine, he remained free of further sexual problems while taking levodopa alone.

Case 3—A 43 year old man who was receiving slow incremental doses of bromocriptine reported complete impotence on reaching a total daily dose of 60 mg daily 13 months after starting treatment. On reduction of the dose to 40 mg daily morning erections and sexual function returned to normal, but parkinsonian symptoms were worse. At 50 mg daily impotence returned and again resolved when the dose was reduced. Partial substitution with levodopa (Sinemet-Plus, one tablet three times daily; bromocriptine 15 mg daily) resulted in good control of parkinsonian symptoms and normal erectile function over a year.

Case 4—A 55 year old man had been taking levodopa (Madopar 750 mg daily, and selegiline 10 mg daily for one year before bromocriptine 15 mg daily was introduced. Ten months later he reported impotence (transient erections and inability to sustain intercourse) since starting treatment with bromocriptine. Withdrawal of bromocriptine resulted in a complete return to normal sexual function within two weeks. Erectile function was unaffected by subsequent increases in the dose of levodopa to control parkinsonian symptoms (Madopar 1 g daily).

Comment

Contrary to the expected effects of dopaminergic drugs, four patients complained of impotence correlating with the dose of bromocriptine. This seems to be specific to bromocriptine as partial substitution with levodopa did not induce further impotence. Neither the fairly selective effect of bromocriptine on the D-2 dopaminergic receptor⁴ nor current understanding of dopamine function⁵ offers clues to this phenomenon.

As the information was spontaneously volunteered impotence, hitherto unrecognised as a side effect of bromocriptine treatment, should be monitored specifically in patients with Parkinson's disease. Formal prospective studies are required to ascertain the true incidence of bromocriptine induced impotence in patients with Parkinson's disease.

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Parasuicide, Scotland, and the World Cup

The pinnacle of international football competition is the World Cup, the finals of which are held quadriennially for about a month in the summer. With separate representation for the home countries and a passion for the game in Scotland, the event generates considerable interest and excitement north of the border, but are individual lives and health affected? We report the effect on parasuicide.

Methods and results

Scotland has qualified for the final stages of the last four World Cup competitions—1974 (West Germany), 1978 (Argentina), 1982 (Spain), and 1986 (Mexico); it has never progressed beyond the opening round, so its participation from first match to elimination has averaged 10 days (range 9-11 days) and the tournament has continued for a further 16 days (range 14-19 days).

Information on parasuicide in the Edinburgh area has been methodically collected since 1968 and is a tried and trusted source of data.¹ All cases of deliberate self poisoning presenting to hospital are admitted to the Lothian

Regional Poisoning Treatment Centre. In 1985, the most recent year for which figures are available, 1422 psychiatric assessments were made, providing data on 90% of admissions. Numbers have been declining since 1976 (1938 assessments) but the proportion of cases not assessed has remained around 10% throughout. Parasuicide managed by family doctors without hospital contact accounts for 30% of events in Edinburgh.²

The number of parasuicides, by sex of the subjects, was obtained for (a) the four World Cup tournaments, beginning on the day of Scotland's opening match (range 24-28 days); (b) the preceding four week period; (c) three successive four week periods after the final match; and (d) between corresponding dates in the two years before and after each tournament (control years). Statistical significances were examined by Wilcoxon's signed ranks test.

Compared with the previous four weeks the average daily number of parasuicides fell in both sexes during all tournaments. In males the reductions in successive competitions were -9%, -31%, -23%, and -46%, whereas in control years there was a median change of -3% (range +36% to -40%), a significant difference ($z=2.23$; $p=0.013$). In females the falls were -14%, -4%, -21%, and -29% compared with a median change of +0.5% (range +30% to -15%) in control years, also significantly different ($z=2.44$; $p=0.007$).

This finding may represent the frequency of parasuicide having been either raised before or lowered during the competitions or it may be due to a combination of these possibilities. The table confirms the pronounced fall associated with the onset of the World Cup ($z=2.68$; $p=0.004$), with no other consecutive comparison reaching statistical significance. The period before the World Cup also differed significantly from that immediately after its completion ($z=2.57$; $p=0.005$) but not from subsequent months. The World Cup period was similar to the ensuing four weeks but thereafter differed with increasing significance (v 4-8 weeks $z=1.73$, $p=0.04$; v 8-12 weeks $z=2.05$, $p=0.02$). These results and the median scores show that the observed reductions were principally explained by low frequencies of parasuicide during World Cup competitions.

Percentage change in frequency of parasuicide by sex in each World Cup year compared with mean of its control years before, during, and after each tournament

World Cup year	Time in relation to World Cup				
	4-0 Weeks before	During World Cup	0-4 Weeks after	4-8 Weeks after	8-12 Weeks after
Males					
1974	+22	+2	-14	-18	-11
1978	+3	-22	-40	-5	+4
1982	+7	-8	-20	+34	+11
1986	+7	-44	+5	+7	-14
Females					
1974	+23	+4	-8	-21	-3
1978	-19	-26	+2	-10	+7
1982	+2	-17	-12	+10	+18
1986	+6	-22	-32	-8	-21
Median change	+6.5	-19.5	-13	-6.5	+0.5

Comment

Fewer parasuicides might be anticipated among males during the World Cup; interest in the sport, distraction from personal problems, and possibly the generation of a sense of patriotism as during war (the "tartan army") are plausible explanations. Reports in the media, however, highlighting the disruption to family life and the detrimental effect on personal relationships that "football widows" experienced during the 1986 competition led us to expect an increase in parasuicides among women. A convincing explanation for the opposite finding is not readily apparent, but the answer may still lie in changes within personal relationships—for example, less contact between couples resulting in fewer disputes. That the reduced frequency of parasuicide is sustained for a month after the tournament is over and fervour has abated in the wake of disappointing performances supports the proposition of an indirect effect operating in both sexes rather than a simple, immediate reaction to football matches.

So despite football failure Scotland's participation in the World Cup finals exercises a stabilising influence on this aspect of people's behaviour.

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