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apomorphine infusions (10 mg/h). Although this patient's motor oscillations (Hoehn and Yahr stage 1–4) had virtually disappeared he began to see "strange animals" around his house. He was aware that these were illusions and, since the apomorphine dose was reduced to 9 mg/h, these manifestations have disappeared without loss of clinical benefit. This patient had had a brief period of visual delusions a year before apomorphine treatment when receiving oral L-dopa and bromocriptine. There was a similar case in the apomorphine-treated group of Stibe et al.[3]

A preceding lisuride-induced psychosis in 3 of 4 affected patients in Ruggieri and colleagues' group is the only obvious possible factor to account for the unusually high frequency of psychosis with apomorphine treatment in their hands. Stibe et al[4] have reported more favourable experiences with apomorphine. The only patient with a history of acute psychosis before apomorphine use in our series had had an acute paranoid hallucinatory syndrome during which he attempted suicide when oral lisuride (0·8 mg per day) had been added to his L-dopa regimen (500 mg/daily) in 1982, but this patient has not shown any signs of mental confusion or psychosis with oral L-dopa (525 mg per day) plus subcutaneous intermittent apomorphine (7·5 mg/daily) over 9 months.

We agree with Ruggieri et al that parkinsonian patients with a history of psychosis are at risk of hallucinations with any dopaminergic treatment. But subcutaneous apomorphine has in our experience proven an effective and safe way of treating fluctuating Parkinson's disease. The risk of psychosis in patients with no history of confusion or hallucinations is low.

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SYMPTOMATIC PARVOVIRUS B19 INFECTION AND HEAT-TREATED FACTOR IX CONCENTRATE

SIR,—Dry heating of factor VIII and IX concentrate at 80°C for 72 h may prevent transmission of non-A, non-B hepatitis and human immunodeficiency virus.[1] Pasi and Hill[2] showed a very low seroconversion rate for B19 virus after first treatment of haemophilic boys with National Health Service (NHS) heat-treated factor VIII concentrate. However, we have seen three patients who had symptomatic B19 infection after infusion of NHS heat-treated factor IX concentrate (table). The patients had little previous exposure to blood products and two had received only heat-treated factor concentrate. All three patients had a rubelliform rash of the trunk and limbs. Patient 3 had a prodromal illness of fever and malaise and patient 2, a young child, had a preceding severe erythema of the face. Patient 1, a female Christmas disease carrier, also complained of arthralgia of wrists, elbows, and knees. None of the patients gave a history of contact with a person with a rash before their rash.

Anti-B19 IgM and IgG were detected by antibody capture radioimmunoassay[3] after the rash in all three patients, although all were B19 antibody negative in earlier stored sera. The factor IX concentrate received by cases 1 and 2 was examined for B19 virus. B19 antigen was not detected in this batch by counter-current immunoelectrophoresis, radioimmunoassay, or immune electron microscopy, and B19 DNA was not detected by dot blot hybridisation. However, B19 DNA was detected by polymerase chain reaction. A second batch of factor IX concentrate received by case 1 was negative for B19 virus by the same techniques.

CLINICAL AND SEROLOGICAL FINDINGS IN THREE PATIENTS WITH B19 VIRUS INFECTION AFTER INFUSION OF NHS FACTOR IX CONCENTRATE

Case (sex/age [yr])	Factor IX batch no	Onset of rash post-infusion (days)	B19 serology		
			Days post-infusion	IgM*	IgG*
1 (F/39)	FJA0005	14	19	>100	25
2 (M/1)	FJA0005	35	41	4·2	>100
3 (M/20)	9A3535	12	12	62	12

*Arbitrary RIA units; more than 3 = positive.

Transmission of B19 virus by factor IX concentrate is implicated in these patients by the development of clinical illness and serologically confirmed B19 infection after infusion of factor IX concentrate. This interpretation is supported by the detection of B19 DNA in one batch of concentrate, although PCR will amplify degraded as well as intact infectious viral DNA. Nevertheless we have demonstrated parvovirus B19 DNA in coagulation factor concentrate and we suggest that B19 virus may be transmitted by heat-treated factor IX concentrates.

B19 virus can cause erythema infectiosum, arthritis, and aplastic crisis[4] and infection in pregnancy can cause fetal loss.[5] Persistent B19 infection has been documented in children with leukaemia.[6] Although transmission of B19 virus to recipients of heat-treated factor VIII and IX concentrates has been demonstrated,[7] we have seen the clinical syndrome after infusion of heat-treated factor concentrates. The effects of repeated exposure of haemophiliacs to such a versatile pathogen are unclear. Blood-borne viruses may continue to present an infective hazard to haemophiliacs despite rigorous heat treatment of coagulation factor concentrates.

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PARENTERAL PEPTIDE SUPPLEMENTS AFTER MAJOR SURGERY

SIR,—Dr Stehle and colleagues (Feb 4, p 231) report that intravenous administration of the dipeptide alanyl-glutamine (Ala-Gln) to postoperative patients "almost abolished trauma-induced muscle glutamine depletion and improved nitrogen balance". However, the test solution also contained glycyl-tyrosine peptide (Gly-Tyr) and it is not adequate to state that "evaluation of the tyrosine peptide was not within the scope of this study". Furthermore the non-reported aminoacid composition of the control diet raises several questions. Preliminary communication of this study[1] indicated that the control and peptide supplemented regimens were isonitrogenous but the peptide supplemented