From our limited experience it seems that repeated courses of calcitonin may be needed after a 3-month interval. As many of the LSS patients are elderly and thus present a higher surgical risk, it seems reasonable to try medical treatment first.

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Subcutaneous apomorphine in Parkinson's disease

Sir: Recently, Stibe *et al*[1] reported the beneficial effect of subcutaneous apomorphine administration in Parkinsonian on-off oscillations. We have studied in a similar way the effect of apomorphine, a D1 and D2 dopaminergic agonist, administered by continuous infusion in four patients and by multiple injection in six patients. All patients had been suffering from disabling motor fluctuations unresponsive to other treatment strategies. Their mean age was 55·8 years and duration of disease was 9·4 years. Domperidone, a peripheral dopamine antagonist[2], 20 mg three times daily, was given for at least 3 days before adding apomorphine to the other dopaminergic drugs, that is, levodopa + decarboxylase inhibitor (mean dosage 635 mg/day) in all patients, and bromocriptine (mean dosage 31 mg/day) in eight patients.

Subcutaneous apomorphine administration induced a substantial motor benefit in all patients, for up to 6 months. In the four patients treated with an infusion pump, the mean duration of off periods per day was lowered from 6 to 1·1 hours (82% improvement), with a mean apomorphine infusion rate of 3·8 mg/h during diurnal hours plus a mean of four additional boluses of 1·5 mg each. Levodopa dosage fell by 61%. In the six patients treated by a penject, the mean duration of off periods per day was lowered from 4·7 to 1·7 hours (63% improvement) with a mean daily number of apomorphine injections of four, the mean dosage of each injection being 2·25 mg. Levodopa dosage was reduced by 15%. In two patients, tremor was abolished by apomorphine during on periods, whereas this was not the case with the previous dopaminergic drug intake. Domperidone could be suspended in all patients but one, within 3 weeks after apomorphine initiation. All patients using pumps, and one patient with multiple injections, developed transitory red nodules at the needle sites. In three patients complaining of pruritus at the injection site, peripheral blood eosinophilia occurred. One patient treated by pump complained of visual hallucinations for 2 days, but another patient reported the disappearance of evening and nocturnal hallucinations. No other side effects occurred.

These results confirmed the reports of Stibe *et al*[1] and Poewe *et al*[3] on the sustained improvement of all dopa-dependant symptoms in Parkinsonian patients with motor fluctuations. Moreover, we found that apomorphine could be useful in alleviating severe tremor, resistant to classical drugs.[4]

Since all other dopaminergic drugs could be stopped in one patient, apomorphine does not necessarily require intermittent administration of levodopa to achieve the best effect, as previously suggested.[5] It is noteworthy that oral high-dosage apomorphine-induced azotaemia[6] did not develop with subcutaneous, relatively low-dosage administration. As the beneficial motor effect can last many months, central dopaminergic receptors do not seem to become tolerant to chronic apomorphine administration unlike peripheral dopaminergic receptors which are implicated in apomorphine-induced emesis and vegetative effects.

These very encouraging results warrant further long-term studies. Technical improvements in drug-delivery systems and in apomorphine physico-chemical properties are needed to obtain easier utilisation by Parkinsonian patients and better subcutaneous tolerance of this new therapeutic method.

Apomorphine hydrochloride was kindly supplied by Laboratoire Aguettant, Lyon.

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Lethal neurotoxicity associated to azidothymidine therapy

Sir: Among the toxic side-effects of azidothymidine (AZT), neurological manifestations such as headache and mild confusion have frequently been described. There is also a case report on lethal neurotoxicity in association with AZT therapy with focal seizures and respiratory arrest.[1]

We report a similar case of an AIDS patient who died probably of neurotoxicity during treatment with AZT. An intravenous drug abuser underwent a first clinical

examination in December 1986 when he was found to be HIV seropositive and affected by persistent generalised lymphadenopathy, also documented by a lymphnode biopsy. In May 1987 he developed Hodgkin's disease, mixed cellularity subtype, stage IVB. He was treated with combination chemotherapy for six cycles, until September 1987, obtaining a partial remission. In October 1987 the patient was hospitalised because of pyrexia, gait abnormalities, weight loss, headache and wide oral candidiasis. A broad spectrum antibacterial and anti-micotic drug treatment was begun. Lumber CSF was normal. A neurological examination excluded focal deficits, but slowness of thought and meningeal signs were disclosed. The brain CT scan was normal.

On 17 November 1987, AZT therapy was begun at a dosage of 200 mg orally every 4 hours. At that time the white blood cell count was 1300/mm^3 (91% polymorphs, 9% lymphocytes), haemoglobin was 8·6 g/dl, platelets were 23·000/mm^3, total number T4 cells were 126/mm^3. After the first day of AZT therapy, the patient conplained of myalgia of the limbs and 5 days later he had focal seizures and respiratory arrest; within these episodes we observed a progressive neurological deterioration with space-temporal disorientation and speech difficulties. The brain CT scan was negative. Despite intravenous diazepam and phenobarbital, focal seizures and respiratory arrest became more frequent and protracted. For this reason on the 21 November the patient ceased to receive AZT therapy and on the 23 November he died.

There were no infectious illnesses, no fluid and electrolyte disturbances or metabolic abnormalities nor any neoplastic lesions affecting the central nervous system, in order to explain the patient's death.

Necropsy, performed after 16 hours, disclosed massive lymphomatous involvement of the retroperitoneal nodes, liver and spleen. The central nervous system did not show any lymphomatous nor infectious involvement but only a nonspecific intra-cerebellar haemorrhagic lesion was described; this was, however, not explanatory of the clinical symptomatology. The toxic action of AZT on the nervous tissue could have been induced by either a direct or indirect mechanism, rendering the pre-existing neurological lesions more severe. In our patient both mechanisms could have taken place and the neurological abnormalities present prior to AZT therapy evolved rapidly during the first days of treatment towards a progressive neurological deterioration with focal seizures, respiratory arrest and death.

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Two spina bifida defects in the same child

Sir: Congenital malformations of the central nervous system have been shown not to be uncommon in black people and reports from Nigeria show that hydrocephalus, anencephaly and myelomeningocele are the common anomalies seen. However, it is very rare for the same patient to have more than one defect of the spine;[1] there are reports in the literature of such cases and the existence of lesions at three separate levels are extremely rare.[2] The first case of a double spina bifida lesion in the same patient in Nigeria is presented in this report.

A 3 month old male child was admitted to hospital with a history that two swellings in the midline of the back had been noticed at birth. He was the third child of his mother. Pregnancy was uneventful throughout and was supervised at a private clinic in Bauchi State where she lived. Delivery was vaginal at term but was at home. The child cried spontaneously and passed meconium after birth.

Examination on 26 January 1988 showed a well nourished baby boy with a head circumference of 39 cm who weighed 5·1 kg. He was breathing spontaneously but had an intermittent stridor which had developed 18 days after birth. The anterior fontanelle was patent, flat and not tense. Two midline cystic

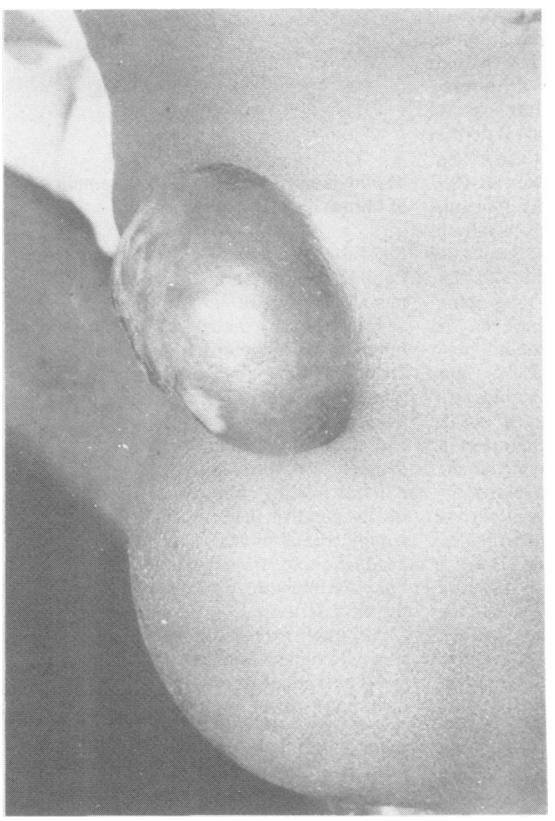

Fig *Thoracic myelomeningocele and lumbosacral lipomyelomeningocele.*